



READ SAFETY INSTRUCTIONS

Servicing:

These products are not customer serviceable TDK-Lambda UK LTD and their authorised agents only are permitted to carry out repairs.

Critical Components:

These products are not authorised for use as critical components in nuclear control systems, life support systems or equipment for use in hazardous environments without the express written approval of the Managing Director of TDK-Lambda EMEA.

Product Usage:

These products are designed for use within a host equipment which restricts access to authorised competent personnel.

This product is a component power supply and is only to be installed by qualified persons within other equipment and must be not operated as a stand alone product.

This product is for sale to business to business customers and can be obtained via distribution channels. It is not intended for sale to end users.

This product is a component power supply and does not fall within the scope of the EMC directive. Compliance with the EMC directive must be considered in the final installation. Please contact your local TDK-Lambda office.

Environmental:

These products are IPX0, and therefore chemicals/solvents, cleaning agents and other liquids must not be used.

Environment:

This power supply is a switch mode power supply for use in applications within a Pollution Degree 2, overvoltage category II environment. Material Group IIIb PCB's are used within it.

Output Loading:

The output power taken from the power supply must not exceed the rating stated on the power supply label, except as stated in the product limitations in this handbook.

Input Parameters:

This product must be operated within the input parameters stated in the product limitations in this handbook.

End of Life Disposal:

The unit contains components that require special disposal. Make sure that the unit is properly disposed of at the end of its service life and in accordance with local regulations.



RISK OF ELECTRIC SHOCK

High Voltage Warning:

Dangerous voltages are present within the power supply. The professional installer must protect service personnel from inadvertent contact with these dangerous voltages in the end equipment.

WARNING: When installed in a Class 1 end equipment, this product must be reliably earthed and professionally installed.

The (+) or (-) output(s) can be earthed or left floating.

The unit cover(s)/chassis (where applicable) must not be made user accessible.

The mains input connector is not acceptable for use as field wiring terminals.

For encased products, do not use mounting screws, which penetrate the unit more than; See drawings.

Internal fuses protect the unit and must not be replaced by the user. In case of internal defect, the unit must be returned to TDK-Lambda UK LTD or one of their authorised agents.

A suitable mechanical, electrical and fire enclosure must be provided by the end use equipment for mechanical, electric shock and fire hazard protection.

The unit cover/chassis, where applicable, is designed to protect skilled personnel from hazards. They must not be used as part of the external covers of any equipment where they may be accessible to operators, since under full load conditions, part or parts of the unit chassis may reach temperatures in excess of those considered safe for operator access.

Allgemeine Sicherheitsvorschriften:

LESEN SIE DIE SICHERHEITSVORSCHRIFTEN

Wartung:

Diese Produkte können nicht durch den Kunden gewartet werden. Nur TDK-Lambda UK LTD. und deren zugelassene Vertriebshändler sind zur Durchführung von Reparaturen berechtigt.

Kritische Komponenten:

Diese Produkte sind nicht für die Verwendung als kritische Komponenten in nuklearen Kontrollsystemen, Lebenserhaltungssystemen oder Geräten in gefährlichen Umgebungen geeignet, sofern dies nicht ausdrücklich und in Schriftform durch den Geschäftsführer von TDK-Lambda EMEA genehmigt wurde.

Produktverwendung:

Diese Produkte sind zur Verwendung innerhalb von Host-Anlagen gedacht, die einen auf das Fachpersonal beschränkten Zugang haben.

Dieses Produkt ist eine Stromversorgungs-Komponente und sie darf nur von qualifiziertem Personal in andere Geräte eingebaut werden und sie darf NICHT als eigenständiges ("Stand-Alone") Gerät betrieben werden.

Dieses Produkt ist für den Verkauf an Geschäftskunden entwickelt worden und es kann über Distributionskanäle bezogen werden.

Es ist NICHT für den Verkauf an Endkunden gedacht und konzipiert.

Dieses Produkt ist eine Stromversorgungsbaugruppe und sie fällt NICHT in den Bereich der EMV Direktive.

Die Konformität mit der EMV Richtlinie muss in der finalen Gesamtinstallation betrachtet werden.

Bitte kontaktieren Sie Ihr regionales TDK-Lambda Vertriebsbüro im Falle von Rückfragen.

Umwelt:

Diese Produkte sind IPX0, aus diesem Grund dürfen keine Chemikalien/Lösungsmittel, Reinigungsmittel und andere Flüssigkeiten verwendet werden.

Umgebung:

Dieses Netzteil ist ein Schaltnetzteil zur Verwendung in einer Umgebung mit einem Verschmutzungsgrad 2, Überspannungskategorie II. Materialgruppe IIIb mit darin verwendeten PCBs.

Ausgangsstrom:

Der Ausgangsstrom des Netztesles darf die Leistung, die auf dem Label des Netztesles vermerkt ist, nur dann überschreiten, wenn dies in den Produktgrenzen dieses Handbuches ausgezeichnet ist.

Eingangsparameter:

Dieses Produkt muss innerhalb der Eingangsparameter, die in den Produktgrenzen dieses Handbuches angegeben sind, betrieben werden.

Entsorgung am Ende der Betriebszeit:

Das Gerät enthält Komponenten die unter Sondermüll fallen. Das Gerät muss am Ende der Betriebszeit ordnungsgemäß und in Übereinstimmung mit den regionalen Bestimmungen entsorgt werden.

**GEFAHR DURCH ELEKTRISCHEN SCHLAG****Hochspannungswarnung:**

Innerhalb des Netztesles gibt es gefährliche Spannungen. Der Elektroinstallateur muss das Wartungspersonal vor versehentlichem Kontakt mit den gefährlichen Spannungen im Endgerät schützen.

WARNUNG! Falls Sie unser Netzgerät in eine Anwendung mit Schutzklasse 1 eingebaut haben, stellen Sie sicher, dass es fachgerecht installiert und zuverlässig geerdet ist.

Die (+) oder (-) Ausgänge können geerdet werden oder unangeschlossen bleiben.

Die Abdeckung des Gerätes/das Gehäuse darf für den Benutzer nicht zugänglich sein.

Der Haupteingangsanschluss ist nicht für die Verwendung als Feldverdrahtungsanschluss geeignet.

Für ummantelt Produkte, verwenden Sie keine Schrauben, die das Gerät mehr als durchdringen; siehe Zeichnung
Eine interne Sicherung schützt das Gerät und darf durch den Benutzer nicht ausgetauscht werden. Im Fall von internen Defekten muss das Gerät an TDK-Lambda UK LTD oder einen der autorisierten Vertriebs Händler zurückgeschickt werden.

Ein geeignetes mechanisches, elektrisches und brandgeschütztes Gehäuse muss als Schutz vor der Gefahr von mechanischen Risiken, Stromschlägen und Brandschutz in dem Endgerät vorgesehen werden.

Die Geräteabdeckung/das Gehäuse ist so entworfen, dass das Fachpersonal vor Gefahren geschützt wird. Sie dürfen nicht als Teil der externen Abdeckung für Geräte verwendet werden, die für den Betreiber zugänglich sein müssen, da Teile oder das gesamte Gerätegehäuse unter voller Auslastung übermäßige Temperaturen erreichen kann, die für den Zugang des Betreibers nicht mehr als sicher betrachtet werden.

Consignes générales de sécurité:

LIRE LES CONSIGNES DE SECURITE

Entretien:

Ces produits ne peuvent pas être réparés par l'utilisateur. Seuls, TDK-Lambda UK LTD et ses agents agréés sont autorisés à effectuer des réparations.

Composants critiques:

Ces produits ne doivent pas être utilisés en tant que composants critiques dans des systèmes de commande nucléaire, dans des systèmes de sauvetage ou dans des équipements utilisés dans des environnements dangereux, sans l'autorisation écrite expresse du directeur général de TDK-Lambda EMEA.

Utilisation du produit:

Ces produits sont conçus pour être utilisés dans un équipement hôte dont l'accès n'est autorisé qu'aux personnes compétentes.

Ce produit est une alimentation considérée comme un composant devant être installé par des personnes qualifiées, dans un autre équipement. Il ne doit pas être utilisé en tant que produit fini.

Ce produit est destiné à la vente entre entreprises et peut être obtenu via des canaux de distribution.

Il n'est pas prévu à la vente pour les particuliers.

Ce produit est une alimentation considérée comme un composant, il ne relève pas du champ d'application de la directive CEM. Le respect de la directive CEM doit être pris en compte dans l'installation finale. Veuillez contacter votre bureau TDK-Lambda le plus proche.

Environnement:

Ces produits sont IPX0, et donc on ne doit pas utiliser des produits chimiques/solvants, des produits de nettoyage et d'autres liquides.

Environnement fonctionnel :

Cette alimentation fonctionne en mode commutation pour utilisation dans des applications fonctionnant dans un environnement avec Degré de Pollution 2 et catégorie de surtension II. Elle utilise des cartes des circuits imprimés (PCB) de Groupe IIIb.

Intensité soutirée:

L'intensité soutirée de l'alimentation ne doit pas dépasser l'intensité nominale marquée sur la plaque signalétique, sauf indications contraires dans les limitations du produit décrit dans ce manuel.

Paramètres d'entrée:

Ce produit doit être utilisé à l'intérieur des paramètres d'entrée indiqués dans les limitations du produit dans ce manuel.

Elimination en fin de vie:

L'alimentation contient des composants nécessitant des dispositions spéciales pour leur élimination. Vérifiez que cette alimentation est mise au rebut correctement en fin de vie utile et conformément aux réglementations locales en vigueur.



RISQUE DE CHOC ELECTRIQUE

Attention-Danger haute tension:

Des tensions dangereuses sont présentes dans l'alimentation. L'installateur doit protéger le personnel d'entretien contre un contact involontaire avec ces tensions dangereuses dans l'équipement final.

AVERTISSEMENT: Si ce produit est installé dans un équipement final de classe I, il doit être mis à la terre de manière fiable et installé par un professionnel averti.

Les sorties (+) ou (-) peuvent être raccordées à la terre ou laissées flottantes.

Le couvercle/châssis de l'alimentation ne doit pas être accessible à l'utilisateur. Le connecteur d'entrée d'alimentation principale ne doit pas être utilisé comme borne de raccordement.

N'utilisez pas de vis pénétrant dans le module sur une profondeur supérieure à : Voir dessins.

Un fusible interne protège le module et ne doit pas être remplacé par l'utilisateur. En cas de défaut interne, le module doit être renvoyé à TDK-Lambda UK LTD ou l'un de ses agents agréés.

Une enceinte appropriée doit être prévue par l'utilisateur final pour assurer la protection contre les chocs mécaniques, les chocs électriques et l'incendie.

Le couvercle et le châssis du module sont conçus pour protéger des personnels expérimentés. Ils ne doivent pas être utilisés comme couvercles extérieurs d'un équipement, accessible aux opérateurs car en condition de puissance maximum, des parties du châssis peuvent atteindre des températures considérées comme dangereuses pour l'opérateur.

Norme generali di sicurezza:

SI PREGA DI LEGGERE LE NORME DI SICUREZZA

Manutenzione:

Il cliente non può eseguire alcuna manutenzione su questi prodotti. L'esecuzione delle eventuali riparazioni è consentita solo a TDK-Lambda UK LTD e ai suoi agenti autorizzati.

Componenti critici:

Non si autorizza l'uso di questi prodotti come componenti critici all'interno di sistemi di controllo nucleari, sistemi necessari alla sopravvivenza o apparecchiature destinate all'impiego in ambienti pericolosi, senza l'esplicita approvazione scritta dell'Amministratore Delegato di TDK-Lambda EMEA.

Uso dei prodotti:

Questi prodotti sono progettati per l'uso all'interno di un'apparecchiatura ospite che limiti l'accesso al solo personale competente e autorizzato.

Questo prodotto è da considerarsi come un alimentatore professionale componente e come tale deve essere installato da personale qualificato all'interno di altre apparecchiature e non può essere utilizzato come prodotto indipendente.

Questo prodotto non è inteso per la vendita al dettaglio o agli utilizzatori finali.

Questo alimentatore è da considerarsi come un componente e come tale non è assogettato dagli scopi della direttiva EMC. Conformità alla direttiva EMC deve essere considerata nell'installazione finale di utilizzo. Gli uffici di TDK-Lambda Sas Succursale Italiana sono a vostra disposizione per ulteriori ragguagli.

Condizioni ambientali:

Questi prodotti sono classificati come IPX0, dunque non devono essere utilizzati sostanze chimiche/solventi, prodotti per la pulizia o liquidi di altra natura.

Ambiente:

Questo prodotto è un alimentatore a commutazione, destinato all'uso in applicazioni rientranti in ambienti con le seguenti caratteristiche: Livello inquinamento 2, Categoria sovratensione II. Questo prodotto contiene schede di circuiti stampati in materiali di Gruppo IIIb.

Carico in uscita:

La potenza in uscita ottenuta dall'alimentatore non deve superare la potenza nominale indicata sulla targhetta dell'alimentatore, fatto salvo dove indicato nei limiti per il prodotto specificati in questo manuale.

Parametri di alimentazione:

Questo prodotto deve essere utilizzato entro i parametri di alimentazione indicati nei limiti per il prodotto, specificati in questo manuale.

Smaltimento:

L'unità contiene componenti che richiedono procedure speciali di smaltimento. Accertarsi che l'unità venga smaltita in modo corretto al termine della vita utile e nel rispetto delle normative locali.



RISCHIO DI SCOSSA ELETTRICA

Avvertimento di alta tensione:

All'interno dell'alimentatore sono presenti tensioni pericolose. Gli installatori professionali devono proteggere il personale di manutenzione dal rischio di contatto accidentale con queste tensioni pericolose all'interno dell'apparecchiatura finale.

ATTENZIONE: Se installato in un'attrezzatura di classe I, questo prodotto deve essere collegato a terra in modo affidabile ed installato in modo professionale.

Le uscite (+) o (-) possono essere messa a terra o lasciate isolate.

I coperchi/il telaio dell'unità non devono essere accessibili da parte dell'utente.

Il connettore dell'alimentazione principale non può essere utilizzato come terminale di collegamento di campo.

Non utilizzare viti che penetrano nell'unità per più di : Vedi disegni

Un fusibile interno protegge l'unità e non deve essere sostituito dall'utente. Nell'eventualità di un difetto interno, restituire l'unità a TDK-Lambda UK LTD o a uno dei suoi agenti autorizzati.

L'apparecchiatura finale deve includere una recinzione meccanica, elettrica e antincendio per proteggere dai pericoli di natura meccanica, dalle scosse elettriche e dai pericoli di incendio.

Il coperchio/telaio dell'unità è realizzato per proteggere il personale esperto dai pericoli. Non deve essere usato come parte degli involucri esterni di qualsiasi apparecchiatura, se risulta accessibile da parte degli addetti, poiché è possibile che in condizioni di pieno carico una o più parti del telaio dell'unità giunga/giungano a temperature superiori ai limiti considerati sicuri per l'accesso da parte degli addetti.

Instrucciones generales de seguridad:

LEA LAS INSTRUCCIONES DE SEGURIDAD

Servicio:

Estos productos no pueden ser reparados por los clientes. TDK-Lambda UK LTD. y sus agentes autorizados son los únicos que pueden llevar a cabo las reparaciones.

Componentes fundamentales:

Estos productos no pueden ser utilizados como componentes fundamentales en sistemas de control nuclear, sistemas de soporte vital o equipos a utilizar en entornos peligrosos sin el consentimiento expreso por escrito del Director General de TDK-Lambda EMEA.

Uso de los productos:

Estos productos han sido diseñados para ser utilizados en un equipo central que restrinja el acceso al personal cualificado autorizado.

Este producto es una fuente de alimentación y sólo puede ser instalado por personal cualificado dentro de otros equipos y no debe ser tratado como un producto independiente. Este producto debe ser vendido entre empresas profesionales y solo puede obtenerse a través de los canales de distribución. No está destinado para la venta a usuarios finales

Este producto es una fuente de alimentación y no se ve afectada por la directiva EMC. El cumplimiento de la directiva EMC se debe considerar en la instalación final. Por favor, póngase en contacto con su oficina local de TDK – Lambda.

Medioambiental:

Estos productos son IPX0 y, por tanto, no pueden utilizarse sustancias químicas/disolventes, agentes de limpieza ni otros líquidos.

Medio ambiente:

Esta fuente de alimentación es una fuente de alimentación de modo conmutado a utilizar en aplicaciones dentro de un entorno con un Grado de contaminación 2 y una Categoría de sobretensión II. En él se utilizan policloruros de bifenilo del Grupo de materiales IIIb.

Carga de salida:

La potencia de salida tomada de la fuente de alimentación no puede sobrepasar el valor nominal indicado en la etiqueta de la fuente de alimentación, excepto en los casos indicados en las limitaciones del producto en este manual.

Parámetros de entrada:

Este producto debe ser utilizado dentro de los parámetros de entrada indicados en las limitaciones del producto en este manual.

Desecho de la unidad:

La unidad contiene componentes que deben ser desechados de una manera especial. Asegúrese de desechar correctamente la unidad al final de su vida útil y conforme a las normas locales vigentes.



PELIGRO DE DESCARGAS ELÉCTRICAS

Advertencia de alta tensión:

En esta fuente de alimentación hay tensiones peligrosas. El instalador profesional debe proteger al personal de servicio contra cualquier contacto accidental con estas tensiones peligrosas en el equipo final.

ADVERTENCIA: La instalación de este producto en un equipo de clase I la deben llevar a cabo profesionales y el producto debe estar conectado a tierra.

La salida o salidas (+) o (-) pueden conectarse a tierra o se las puede dejar flotando.

Debe impedirse el acceso de los usuarios a la cubierta o cubiertas y al chasis de la unidad.

El conector de entrada de la red no es apto para ser utilizado a modo de bornes de cableado de campo.

No utilice tornillos de montaje susceptibles de penetrar en la unidad más de: Ver dibujos.

Un fusible interno protege la unidad y este no debe ser nunca reemplazado por el usuario. En caso de existir algún defecto interno, la unidad debe ser enviada a TDK-Lambda UK LTD o a uno de sus agentes autorizados.

El equipo de uso final debe constituir un recinto de protección mecánica, eléctrica y contra incendios de protección mecánica, contra descargas eléctricas y contra el peligro de incendios.

La cubierta/chasis de la unidad ha sido diseñada para que proteja a las personas cualificadas de los peligros. No deben ser utilizadas como parte de las cubiertas externas de cualquier equipo al que pueden acceder los operarios, ya que bajo unas condiciones de carga completa, la pieza o piezas del chasis de la unidad pueden alcanzar temperaturas superiores a las consideradas seguras para el acceso de los operarios.

Instruções gerais de segurança:

LEIA AS INSTRUÇÕES DE SEGURANÇA

Manutenção:

Estes produtos não são podem ser submetidos a manutenção por parte do cliente. Apenas a TDK-Lambda UK LTD e os seus agentes autorizados têm permissão para realizar reparações.

Componentes essenciais:

Não é autorizada a utilização destes produtos como componentes essenciais de sistemas de controlo nuclear, sistemas de suporte de vida ou equipamento para utilização em ambientes perigosos sem a expressa autorização por escrito do Director-Geral da TDK-Lambda EMEA.

Utilização do produto:

Estes produtos foram concebidos para utilização dentro de um equipamento de alojamento que apenas permita o acesso a pessoal qualificado autorizado.

Este produto é uma alimentação considerado com um componente para ser instalado por pessoas qualificadas, em outros equipamentos. Não deve ser usado como um produto acabado.

Este produto é destinado para venda entre as empresas e pode ser obtido através de canais de distribuição. Não se destina à venda aos particulares.

Este produto é uma alimentação considerado com um componente, não é dentro do application âmbito da directiva CEM.

Conformidade com a directiva CEM devem ser considerados na instalação final.

Entre em contacto com seu escritório TDK-Lambda mais próximo.

Ambiental:

Estes produtos são IPX0 e, como tal, não se devem utilizar químicos/solventes, agentes de limpeza e outros líquidos.

Ambiente:

Esta fonte de alimentação é uma fonte de alimentação do modo de comutação para utilização em aplicações com um Nível de Poluição 2 e ambientes da categoria de sobretensão II. São utilizadas placas de circuitos impressos do grupo de materiais IIIb.

Carga de saída:

A potência de saída extraída da fonte de alimentação não deve exceder a classificação assinalada na etiqueta da fonte de alimentação, excepto quando indicado nas limitações do produto neste guia.

Parâmetros de entrada:

Este produto deve ser utilizado dentro dos parâmetros de entrada indicados nas limitações do produto neste guia.

Eliminação no fim de vida:

A unidade contém componentes que necessitam de procedimentos especiais de eliminação. Certifique-se de que a unidade é devidamente eliminada no fim da sua vida útil e que tal é feito em conformidade com os regulamentos locais.



RISCO DE CHOQUE ELÉCTRICO

Aviso de alta tensão:

Estão presentes tensões perigosas dentro da fonte de alimentação. O profissional que realizar a instalação deve proteger o pessoal de assistência contra contactos inadvertidos com estas tensões perigosas do equipamento final.

AVISO: Quando instalado num equipamento de Classe I, este produto deve ser ligado à terra de forma fiável e instalado por um profissional.

As saídas (+) e (-) podem ser ligadas à terra ou deixadas soltas.

O chassis/cobertura(s) da unidade não deve estar acessível ao utilizador.

O conector de entrada de alimentação não deve ser utilizado como terminal de cablagens no local.

Não utilize parafusos de montagem, uma vez que estes penetrarão na unidade em mais do que: Veja os desenhos

Existe um fusível interno que protege a unidade e que não deve ser substituído pelo utilizador. Em caso de defeito interno, a unidade deve ser devolvida à TDK-Lambda UK LTD ou a um dos seus agentes autorizados.

O equipamento de utilização final deve fornecer um bastidor com protecção mecânica, eléctrica e contra incêndios adequada.

O chassis/cobertura da unidade está concebido de forma a proteger o pessoal especializado de perigos. Não devem ser utilizados como parte das coberturas externas de qualquer equipamento em que possam estar acessíveis aos operadores, uma vez que em condições de carga máxima, algumas peças do chassis da unidade podem atingir temperaturas superiores às consideradas seguras para o acesso do operador.

TDK-Lambda

TDK-Lambda UK Ltd
Kingsley Avenue, Ilfracombe
Devon, EX34 8ES
Telephone - Sales and Service +44 (0)1271 856666
Head Office and Works +44 (0)1271 856600
Facsimile +44 (0)1271 864894
WEBSITE: www.uk.tdk-lambda.com

CCG 1R5/3

Instruction Manual

BEFORE USING THE POWER SUPPLY

Be sure to read this instruction manual thoroughly before using this product. Pay attention to all cautions and warnings before using this product. Incorrect usage could lead to an electrical shock, damage to the power supply or a fire hazard.

DANGER

Never use this product in locations where flammable gas or ignitable substances are present.

INSTALLATION WARNING

- When installing, ensure that work is done in accordance with the instruction manual. When installation is improper, there is risk of electric shock and fire.
- Installation shall be done by Service personnel with necessary and appropriate technical training and experience. There is a risk of electric shock and fire.
- Do not cover the product with cloth or paper etc. Do not place anything flammable around. This might cause damage, electric shock or fire.

WARNING on USE

- Do not touch this product or its internal components while circuit in operation, or shortly after shutdown. You may receive a burn.
- While this product is operating, keep your hands and face away from it as you may be injured by an unexpected situation.
- There are cases where high voltage charge remains inside the product. Therefore, do not touch even if they are not in operation as you might get injured due to high voltage and high temperature. You might also get electric shock or burn.
- Do not make unauthorized changes to this product nor remove the case as you might get an electric shock or might damage the product. The product has been modified, changed or disassembled will be out of warranty.
- Do not use this product under unusual condition such as emission of smoke or abnormal smell and sound etc. Please stop using it immediately and shut off the product. It might lead to fire and electric shock. In such cases, please contact us. Do not attempt repair by yourself, as it is dangerous for the user.
- Do not operate and store these products in environments where condensation occurs due to moisture and humidity. It might lead fire and electric shock.
- Do not drop or apply shock to this product. It might cause failure. Do not operate these products mechanical stress is applied.

CAUTION on MOUNTING

- Confirm connections to input terminals, output terminals and signal terminals are correct as indicated in the instruction manual before switching on.
- Input line and output line of mounting board, please use the wires as short and thick as possible.
- Do not use this product in special environment with strong electromagnetic field, corrosive gas or conductive substances and direct sunlight, or places where product is exposed to water or rain.
- Mount this product properly in accordance with the instruction manual, mounting direction and shall be properly be ventilated.
- Please shut down the input when connecting input and output of the product.
- When installing in environment where conductive foreign, dust and liquid may be present, please consider penetration of above foreign material in the power supply by installing filter, to prevent trouble or malfunction.
- The mounting parts on the bottom side of product are exposed. Take note that do not touch those components when handling.

⚠ CAUTION on USE

- Product individual notes are shown in the instruction manual. If there is any difference with common notes, individual notes shall have priority.
- Before using this product, be sure to read the catalog and instruction manual. There is risk of electric shock or damage to the product or fire due to improper use.
- Input voltage, Output current, Output power, ambient temperature and ambient humidity should be kept within specifications, otherwise the product will be damaged, or cause electric shock or fire.
- For products without built-in protection circuit (element, fuse, etc.), insert fuse at the input to prevent smoke, fire during abnormal operation.
- For externally mounted fuse do not use other fuses aside from our specified and recommended fuse.
- This product was made for general purpose electronic equipment use and is not designed for applications requiring high safety (such as extremely high reliability and safety requirements. Even though high reliability and safety are not required, this product should not be used directly for applications that have serious risk for life and physical safety. Take sufficient consideration in fail-safe design (such as providing protective circuit or protective device inside the system, providing redundant circuit to ensure no instability when single device failure occurs).
- When used in environments with strong electromagnetic field, there is possibility of product damage due to malfunction.
- When used in environment with corrosive gas (hydrogen sulfide, sulfur dioxide, etc.), there is possibility that they might penetrate the product and lead to failure.
- When used in environments where there is conductive foreign matter, dust or liquid, there is possibility of product failure or malfunction.
- Provide countermeasure for prevention of lightning surge voltage as there is risk of damage due to abnormal voltage.
- Take care not to apply external abnormal voltage to the output terminals and signal terminals. Especially, applying reverse voltage or overvoltage more than the rated voltage to the output might cause failure, electric shock or fire.
- Never operate the product under overcurrent or short circuit condition. Insulation failure, or other damages may occur.
- The application circuits and their parameters are for reference only. Be sure to verify effectiveness of these circuits and their parameters before finalizing the circuit design. Moreover, we will not be responsible on application patent or utility model.
- Excessive stress could cause damage. Therefore, please handle with care.
- Use recommended external fuse to each products to ensure safe operation and compliance with the Safety Standards to which it is approved.
- The input power source to this product must have reinforced or double insulation from the mains.
- This product has possibility that hazardous voltage may occur in output terminal depending on failure mode. The output of these products must be protected by over voltage protection circuit in the end use equipment to maintain SELV.

⚠ Note

- When disposing product, follow disposal laws of each municipality.
- Published EMI (CE, RE) or immunity is the result when measured in our standard measurement conditions and might not satisfy specification when mounted and wired inside end-user equipment.
- Use the product after sufficiently evaluating at actual end-user equipment.
- If products are exported, please register the export license application etc. by the Government of Japan according to Foreign Exchange and Foreign Trade Control Law.
- The information in the catalog or the instruction manual is subject to change without prior notice. Please refer to the latest version of the catalog or the instruction manual.
- No part of this document may be copied or reproduced in any form without prior written consent TDK-Lambda.

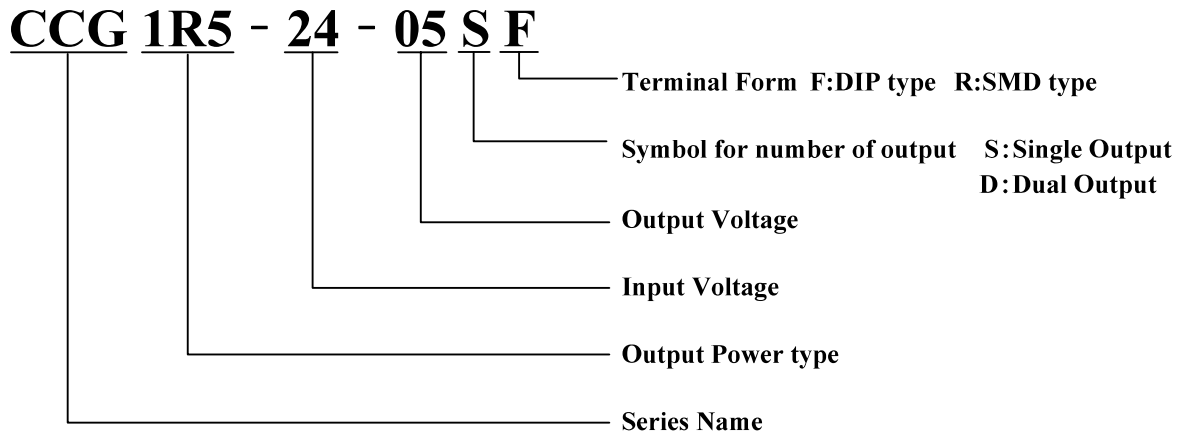
⚠ LONG-TERM STORAGE METHOD AND PERIOD

- Please keep the product in carton box.
 - Please do not apply excessive vibration, shock or mechanical stress applied directly to the product.
 - Consider storage of the product at normal temperature and humidity avoiding direct exposure to sunlight.
 - For long-term storage temperature and humidity, the following conditions shall be used as a guideline :
 - Temperature range : 5°C~30°C
 - Humidity range : 40%~60%RH
 - Please keep away from the places where temperature and humidity can change drastically.
 - It can cause condensation on the product or deterioration.
 - For long-term storage period, we recommend to use within 2 years after receiving the product.
- For products that have been received for more than 1 year, please check lead oxidation and solderability.
In addition, MSL (Moisture Sensitivity Level) of SMD type product is equivalent to 1.

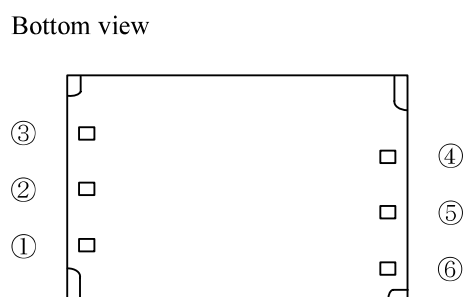
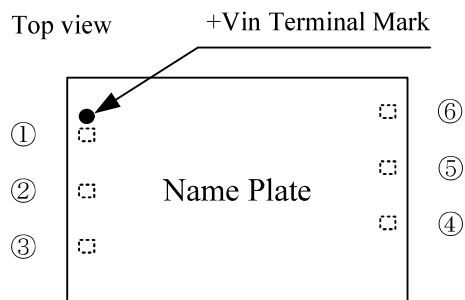
Index

	Page
1. Model name identification method	5
2. Terminal Explanation	5
3. Block Diagram	6
4. Sequence Time Chart	7
5. Terminal Connecting Method	8
6. Explanation of Functions and Precautions	11
6-1. About Input Voltage	11
6-2. Output Voltage Adjustable Range	12
6-3. Measurement Method of Output Ripple and Noise	15
6-4. Line Regulation	16
6-5. Load Regulation	16
6-6. Over Current Protection (OCP)	16
6-7. Remote ON/OFF Control (RC Terminal)	17
6-8. Redundant Operation	18
6-9. Parallel Operation	18
6-10. Series Operation	18
6-11. Operating Ambient Temperature	19
6-12. Operating Ambient Humidity	19
6-13. Storage Ambient Temperature	19
6-14. Storage Ambient Humidity	19
6-15. Withstand Voltage	19
6-16. Isolation Resistance	20
7. Output Derating	21
7-1. Output Derating Measurement Method	21
7-2. Output Derating Curve	22
8. Mounting Method, Soldering and Cleaning Condition	33
8-1. Mounting Method	33
8-2. Recommended Soldering Condition	35
8-3. About Cleaning	35
9. Before Concluding Power Module Damage	36
10. Warranty Period	36
11. CE Marking / UKCA Marking	36

1. Model name identification method



2. Terminal Explanation



CCG-S

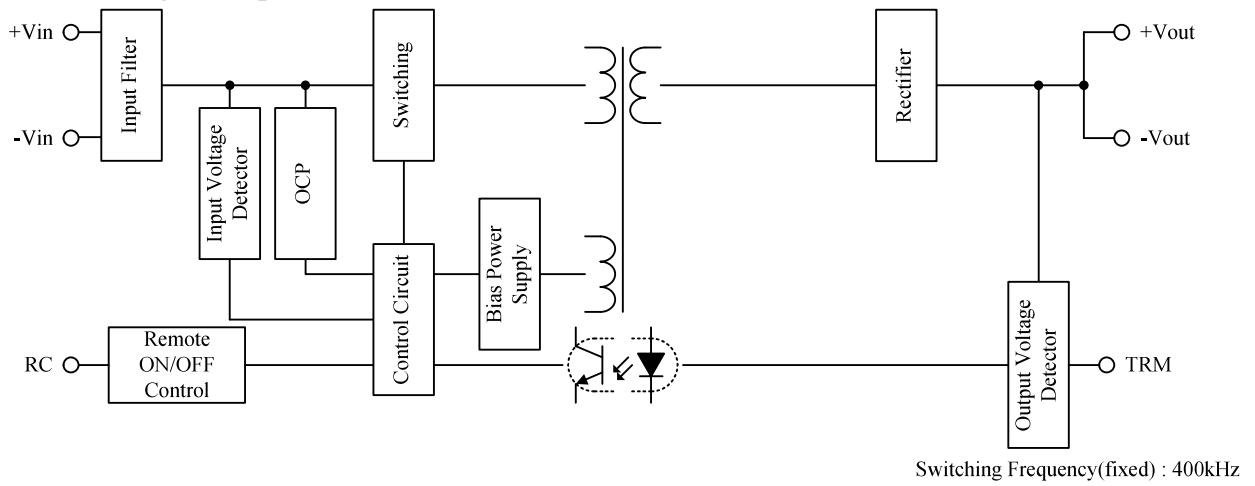
- ① +Vin : +Input Terminal
- ② RC : Remote ON/OFF Control Terminal
- ③ -Vin : -Input Terminal
- ④ -Vout : -Output Terminal
- ⑤ TRM : Output Voltage Trimming Terminal
- ⑥ +Vout : +Output Terminal

CCG-D

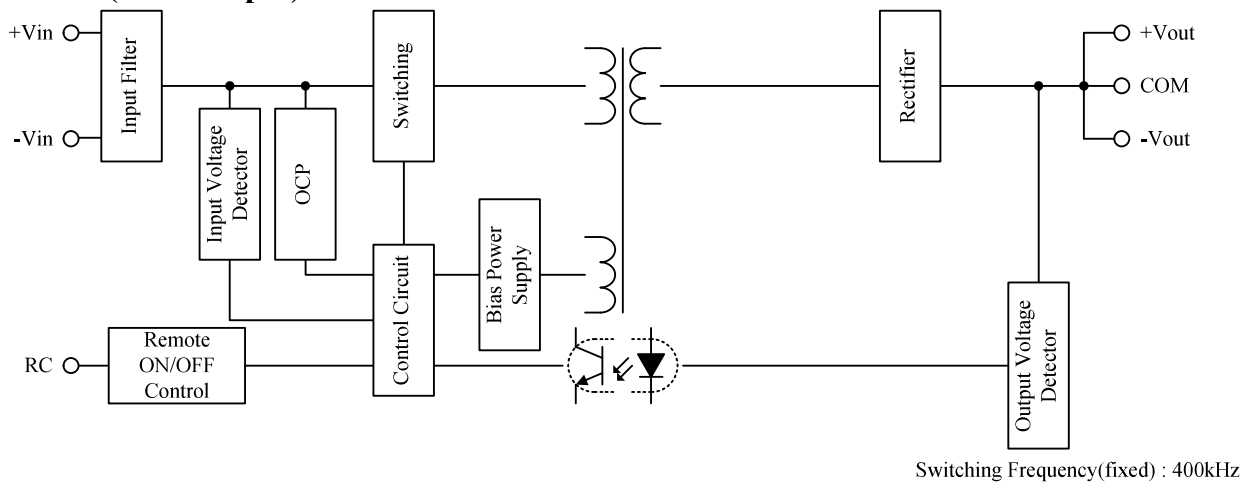
- ① +Vin : +Input Terminal
- ② RC : Remote ON/OFF Control Terminal
- ③ -Vin : -Input Terminal
- ④ -Vout : -Output Terminal
- ⑤ COM : Common Ground Terminal
- ⑥ +Vout : +Output Terminal

3. Block Diagram

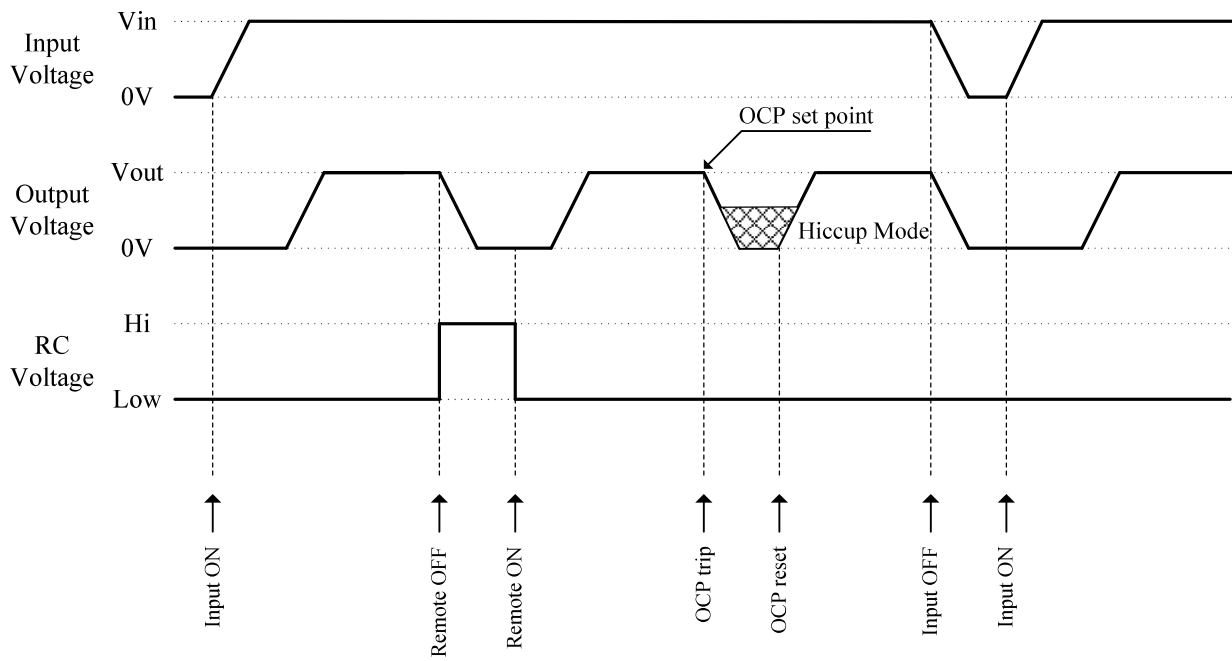
CCG-S (Single Output)



CCG-D (Dual Output)



4. Sequence Time Chart



5. Terminal Connecting Method

In order to use the CCG series, this power supply must be connected with external components according to Fig.5-1.

If it is connected to wrong terminal, the power supply will be damaged. Pay attention to each wiring. External application should be connected in order to meet various EMI and EMS requirement. Refer to Evaluation data, Reliability data and IEC61000 Test data of CCG1R5/3 (target model).

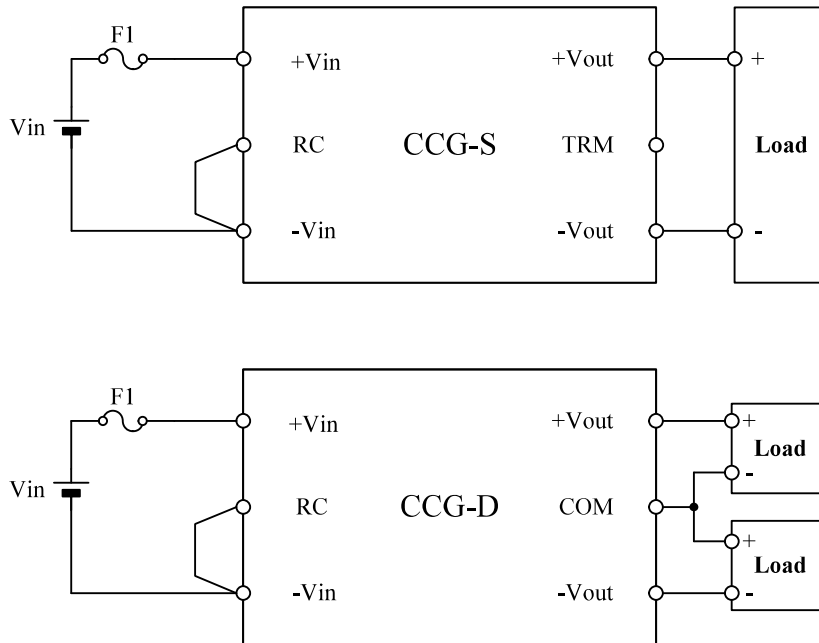


Fig.5-1 Basic connection

F1 : Input Fuse

CCG series has no internal fuse.

Use external fuse for each power supply to comply various Safety Standards and to improve safety. Select a DC fuse, it must be connected to +Vin side if -Vin side is used as ground, or it must be connected to -Vin side if +Vin side is used as ground.

Consider margin over the maximum input voltage to be actually used when selecting fuse.

Moreover, consider I^2t fuse rating for surge current (inrush current) during line throw-in.

Select the following recommended item or equivalent, and evaluate enough on actual system.

Input Fuse Recommended product and Current Rating

CCG1R5-12-xxS/D, CCG3-12-xxS/D : DC86V11CT 3.15A (SOC) (3.15A rated)

CCG1R5-24-xxS/D, CCG3-24-xxS/D : DC86V11CT 1.6A (SOC) (1.6A rated)

CCG1R5-48-xxS/D, CCG3-48-xxS/D : DC86V11CT 1.25A (SOC) (1.25A rated)

● **External Input Capacitor**

This power supply is capable of operating without external input capacitor. External capacitor can reduce input ripple voltage and conduct emission noise as shown in Fig.5-2. Connect external input capacitor as necessary.

Note) 1.The operation of power supply may become unstable if inductance of the input line is large when the input line is long or a choke coil is inserted in the line. For this case, connect a capacitor with sufficiently large capacitance. The capacitance of external input capacitor is influenced by the impedance characteristics of pattern on printed circuit board and choke coil etc. Please choose it by pre-evaluation sufficiently on actual system.
2.Connect an external capacitor as close to input terminal as possible.

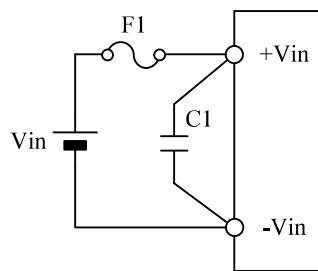


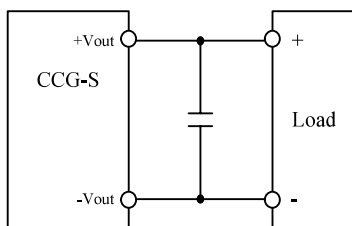
Fig.5-2 The way to connect external input capacitor

● **External Output Capacitor**

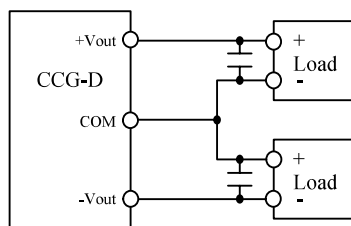
This power supply is capable of operating without external output capacitor. For case of abrupt changes in load current or the line to the load is long, output voltage might become unstable. In this case, it is possible to stabilize the output voltage by attaching capacitor as shown in Fig.5-3. Maximum capacitance of external output capacitor is shown in Table 5-1.

Table 5-1 Maximum Capacitance of External Output Capacitor

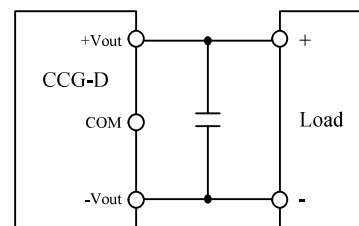
Output Voltage / Model	CCG1R5	CCG3	Connection Method
3.3V,5V	220 μ F	220 μ F	Fig.5-3(a)
12V,15V	100 μ F	100 μ F	
\pm 12V, \pm 15V	100 μ F	100 μ F	Fig.5-3(b)
\pm 12V, \pm 15V	47 μ F	47 μ F	Fig.5-3(c)



(a)Add to Single Output Model



(b)Add to Dual Output Model
(Use as dual output)



(c)Add to Dual Output Model
(Use as single output)

Fig.5-3 Adding method of external output capacitor

● **Protection for Reversed Input Connection**

Reverse input polarity would cause power supply damage. If there is a possibility of reverse connection, connect a protective diode and fuse as shown in Fig.5-4 or Fig.5-5. Use protective diode with higher voltage rating than the input voltage, and with higher surge current rating than fuse current rating.

The protection circuit as shown in Fig.5-5 can prevent fuse blow when reverse input polarity. But, please take note that power loss will constantly occur due to conduction of the diode.

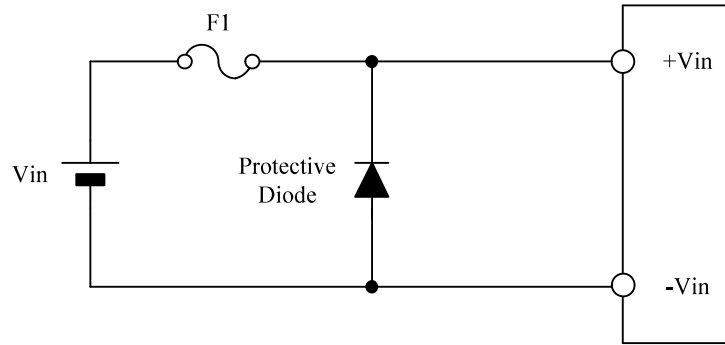


Fig.5-4 Protection for Reversed Input Connection (1)

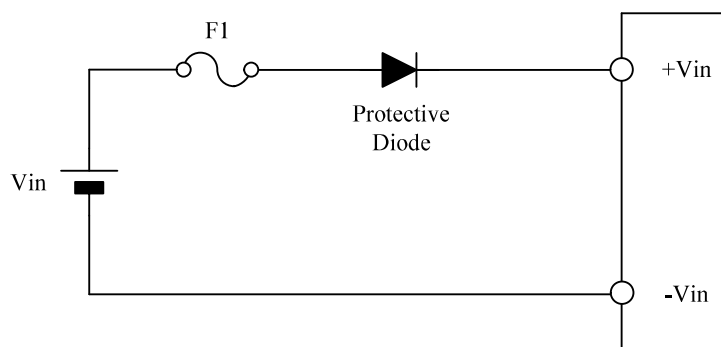


Fig.5-5 Protection for Reversed Input Connection (2)

● **Protection of Instantaneous Input Voltage Drop**

Note) When instantaneous drop of input voltage is occur, output voltage might become unstable. In particular, in the case of input voltage recover before output voltage drops to 0V after the input voltage instantaneous drop, the output voltage may overshoot.

In this case, it is possible to stabilize the output voltage by attaching input voltage retention diode and capacitor C1 as shown in Fig.5-6.

The appropriate capacitance value of C1 is influenced by load factor used, capacitance of capacitor connected to output side and expected time that dips or short interruption.

Please choose it by pre-evaluation sufficiently on actual system.

Use input voltage retention diode with higher current rating than fuse current rating.

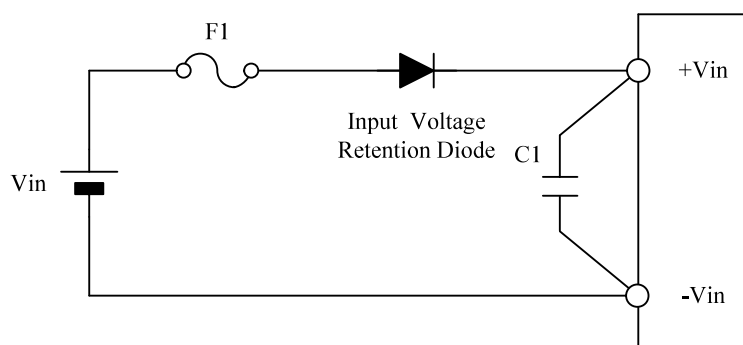


Fig.5-6 Protection of Instantaneous Input Voltage Drop

6. Explanation of Functions and Precautions

6-1.About Input Voltage

● Input Voltage Range

Input voltage range for CCG series is indicated below.

Input Voltage Range

CCGxxx-12-xxS/D : 4.5 ~ 18VDC

CCGxxx-24-xxS/D : 9 ~ 36VDC

CCGxxx-48-xxS/D : 18 ~ 76VDC

Take note that power supply might be damaged when applied input voltage which is out of specified range.

Take note that variation range of the input voltage and maximum and minimum values of ripple voltage do not out of above input voltage range.

Output ripple voltage may increase by level of ripple voltage or frequency about input voltage.

So evaluate enough before using on actual system.

Take note that sudden change of input voltage may cause variation of output voltage transitionally.

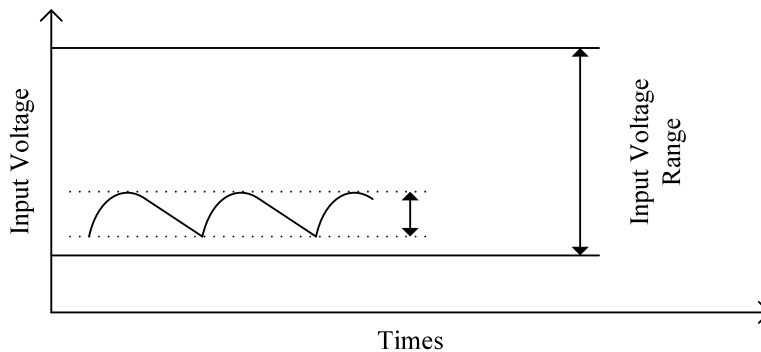


Fig.6-1 Input Ripple Voltage

● About Rise and Fall Slope of Input Voltage

If the input line is directly disconnected / connected by a switch component or other, this product may be damaged due to the generation of excessive surge voltage / current.

In this case, adjust such as adding an input capacitor so that the slope of the input voltage is $0.8\text{V}/\mu\text{s}$ or less or reduce switching speed of switching device.

6-2. Output Voltage Adjustable Range (Only CCG-S)

Output voltage could be adjusted within the range described below by connecting external resistor or variable resistor.

However, take note that power supply might be damaged when output voltage exceeds the range described below.

Output Voltage Adjustable Range : -5% ~ +10% of Nominal Output Voltage

● **Output Voltage Adjustment by External Resistor or Variable Resistor**

(1) In case of adjusting output voltage lower

(1-1) Maximum output current

Take note that when output voltage is decreased, do not over the maximum output current of specification.

ex) In case of CCG1R5-xx-05S

When setting 5V Model to 4.75V output, maximum output power = 4.75V × 0.3A = 1.425W.

(1-2) External resistor connecting method

Connect an external resistor or variable resistor Ra between TRM and +Vout terminal as shown in Fig.6-2.

To prevent the effect of noise or other, wire as short as possible because TRM terminal is relatively high impedance.

Please refer to Table 6-1 when adjusting output voltage.

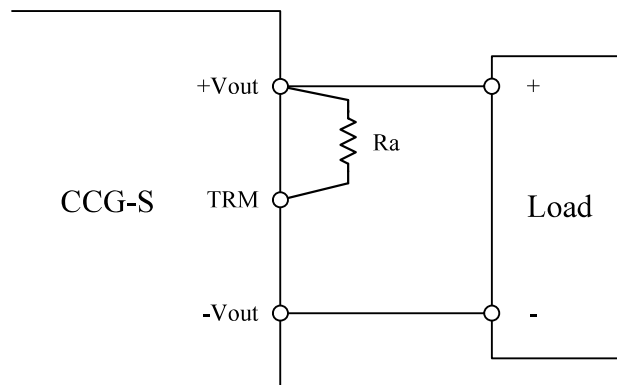


Fig.6-2 Basic Connection for Output Voltage Trim Down

Table 6-1 Equation of External Resistor and Output Voltage

Unit (Output Voltage : Vout [V], External Resistor : Ra [kΩ])

Model	Equation	
CCGxxx-xx-03S	$V_{out} = 3.31 - \frac{9.31}{16.50 + R_a}$	$R_a = \frac{9.31}{3.31 - V_{out}} - 16.50$
CCGxxx-xx-05S	$V_{out} = 5.02 - \frac{31.17}{23.22 + R_a}$	$R_a = \frac{31.17}{5.02 - V_{out}} - 23.22$
CCGxxx-xx-12S	$V_{out} = 12.1 - \frac{257.3}{41.7 + R_a}$	$R_a = \frac{257.3}{12.1 - V_{out}} - 41.7$
CCGxxx-xx-15S	$V_{out} = 15.2 - \frac{424.6}{48.4 + R_a}$	$R_a = \frac{424.6}{15.2 - V_{out}} - 48.4$

Output voltage could be adjusted within the -5% of nominal output voltage by external resistor Ra.

(2) In case of adjusting output voltage higher

(2-1) Maximum output current

When increasing the output voltage, reduce the output current accordingly so as not to exceed the maximum output power.

ex) In case of CCG1R5-xx-05S

When setting 5V Model to 5.5V output, maximum output current = $1.5W \div 5.5V = 272.7mA$.

(2-2) External resistor connecting method

Connect an external resistor or variable resistor R_b between TRM and -Vout terminal as shown in Fig.6-3.

To prevent the effect of noise or other, wire as short as possible because TRM terminal is relatively high impedance. Please refer to Table 6-2 when adjusting output voltage.

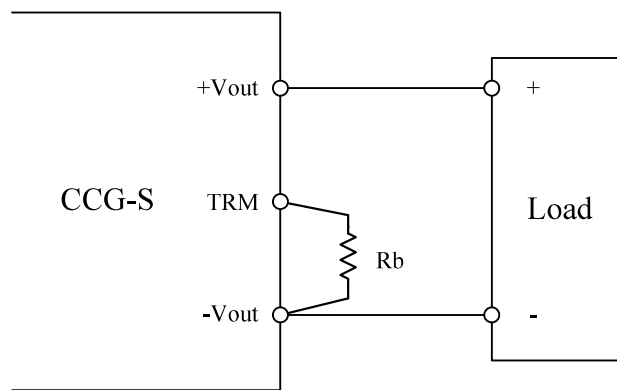


Fig.6-3 Basic Connection for Output Voltage Trim Up

Table 6-2 Equation of External Resistor and Output Voltage

Unit (Output Voltage : Vout [V], External Resistor : R_b [k Ω])

Model	Equation	
CCGxxx-xx-03S	$V_{out} = 3.31 + \frac{5.58}{12 + R_b}$	$R_b = \frac{5.58}{V_{out} - 3.31} - 12$
CCGxxx-xx-05S	$V_{out} = 5.02 + \frac{10.10}{15 + R_b}$	$R_b = \frac{10.10}{V_{out} - 5.02} - 15$
CCGxxx-xx-12S	$V_{out} = 12.1 + \frac{29.2}{18 + R_b}$	$R_b = \frac{29.2}{V_{out} - 12.1} - 18$
CCGxxx-xx-15S	$V_{out} = 15.2 + \frac{37.4}{18 + R_b}$	$R_b = \frac{37.4}{V_{out} - 15.2} - 18$

Output voltage could be adjusted within the +10% of nominal output voltage by external resistor R_b .

(3) In case of adjusting output voltage within adjustable range

(3-1) Maximum output current

Take note that when output voltage is decreased, do not over the maximum output current of specification.

When increasing the output voltage, reduce the output current accordingly so as not to exceed the maximum output power.

(3-2) External resistor connecting method

Connect an external resistor Ra between +Vout and TRM terminal as shown in Fig.6-4, and connect an external resistor Rb and variable resistor VR between TRM and -Vout terminal.

To prevent the effect of noise or other, wire as short as possible because TRM terminal is relatively high impedance. Please refer to Table 6-3 when adjusting output voltage.

Please refer to Table 6-4 when selecting external resistor.

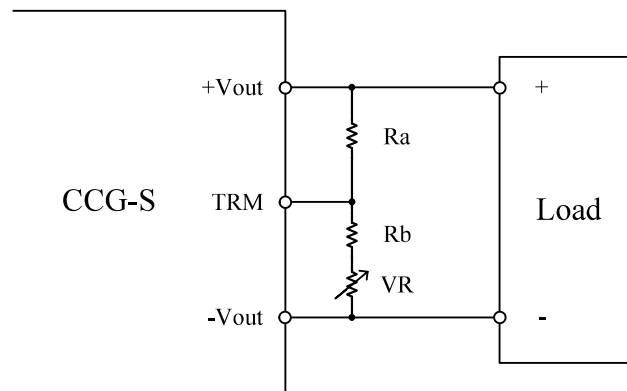


Fig.6-4 Basic connection for adjusting output voltage within adjustable range

Table 6-3 Equation of External Resistor and Output Voltage

Unit (Output Voltage : Vout [V], External Resistor : Ra Rb VR [kΩ])

Model	Equation
CCGxxx-xx-03S	$V_{out} = 3.31 + \frac{5.58 \times R_a - 9.32 (VR + R_b)}{(R_a + 16.50) (VR + R_b) + 12 \times R_a}$
CCGxxx-xx-05S	$V_{out} = 5.02 + \frac{10.10 \times R_a - 31.06 (VR + R_b)}{(R_a + 23.22) (VR + R_b) + 15 \times R_a}$
CCGxxx-xx-12S	$V_{out} = 12.1 + \frac{29.2 \times R_a - 257.2 (VR + R_b)}{(R_a + 41.7) (VR + R_b) + 18 \times R_a}$
CCGxxx-xx-15S	$V_{out} = 15.2 + \frac{37.4 \times R_a - 424.5 (VR + R_b)}{(R_a + 48.4) (VR + R_b) + 18 \times R_a}$

Output voltage could be adjusted within the -5% ~ +10% of nominal output voltage by external resistor Ra, Rb, VR.

Table 6-4 External Resistor (Reference Value)

Model	Ra(kΩ)	Rb(kΩ)	VR(kΩ)
CCGxxx-xx-03S	6.8	0.100	10
CCGxxx-xx-05S	15	0.470	10
CCGxxx-xx-12S	47	0.560	10
CCGxxx-xx-15S	33	0.470	5

6-3. Measurement Method of Output Ripple and Noise

Measurement method of output ripple and noise voltage is shown in Fig.6-5.
 Connect ceramic capacitor (C2, C3 : 1 μ F) at 50mm distance from the output terminal.
 Measure at C2 and C3 terminals as shown in Fig.6-5 using coaxial cable with JEITA attachment.
 Use oscilloscope with 100MHz frequency bandwidth or equivalent.

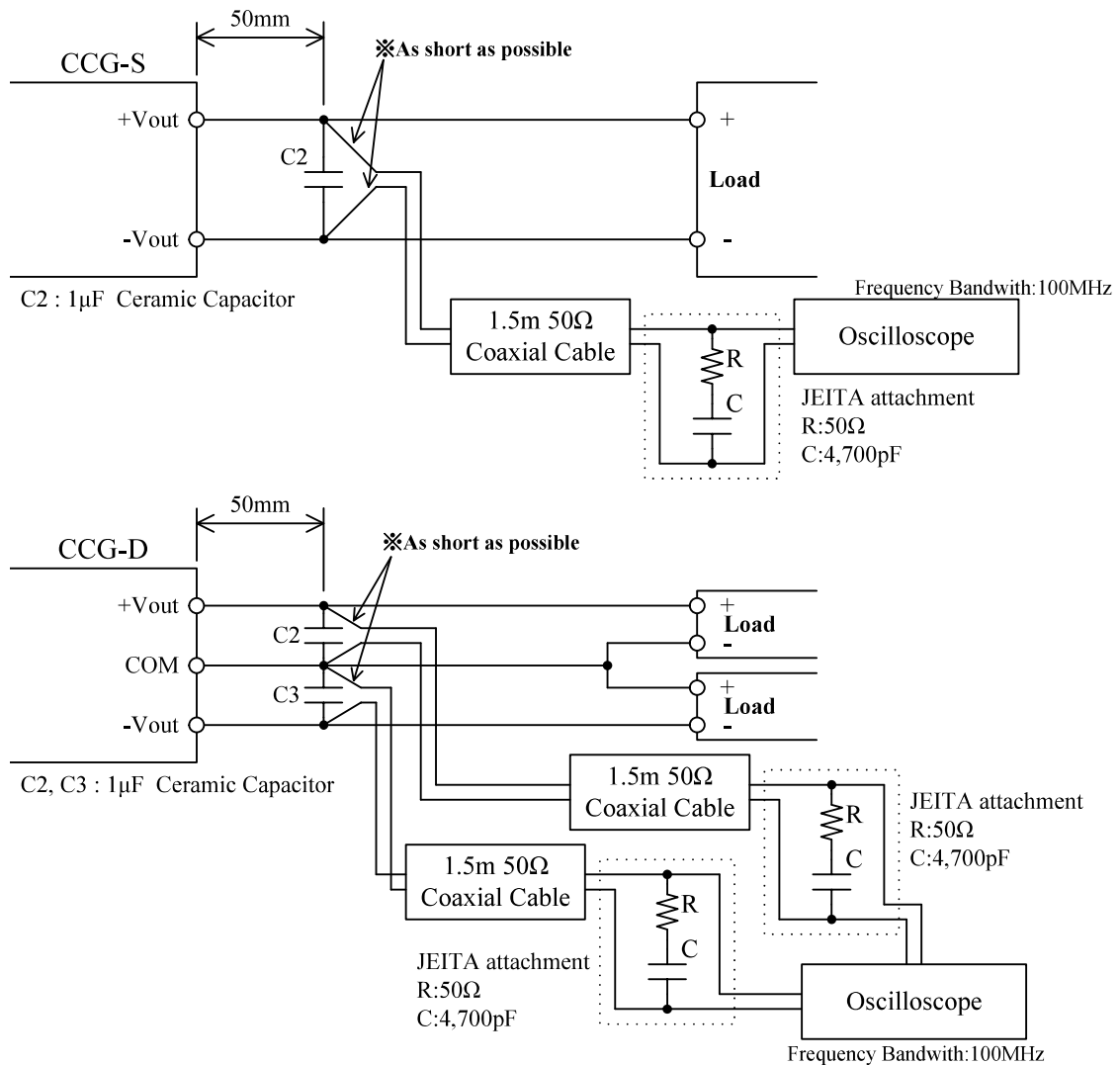


Fig.6-5 Measurement Method of Maximum Output Ripple and Noise

Take note that PCB wiring design might influence output ripple voltage and spike noise voltage. Generally, increasing capacitance value of external capacitor can reduce output ripple voltage and connecting ceramic capacitor can reduce output spike noise voltage.

6-4. Line Regulation

Line regulation of specification is the variation value of output voltage when input voltage is gradually varied (steady state) within specified input voltage range.

Please consider to connect the protection circuit as shown in Fig.5-6 if there is a possibility that instantaneous drop of input voltage might happen.

A thorough pre-evaluation must be performed before using this power supply.

6-5. Load Regulation

Load regulation of specification is the variation value of output voltage when output current is gradually varied (steady state) within specified output current range.

When using at dynamic load mode, output voltage fluctuation might increase.

Also, when CCG-D is used with unbalanced load, the output voltage with the higher load factor decreases and the output voltage with the lower load factor increases.

A thorough pre-evaluation must be performed before using this power supply.

6-6. Over Current Protection (OCP)

This power supply has built-in OCP function.

When short circuit or output current is in overload condition, it becomes intermittent operation.

Output will recover when short circuit or overload conditions are released.

Take note that power supply might be damaged at continuous overload conditions depending on thermal conditions.

6-7. Remote ON/OFF Control (RC terminal)

The output can be enabled/disabled by RC terminal without turning the input supply on and off. This function is Negative Logic.

In order to use remote ON/OFF control function, attach transistor, relay or equivalent switch between RC and -Vin terminal as shown in Fig.6-6.

For secondary control, isolation can be achieved through the use of a opto-coupler or equivalent as shown in Fig.6-7.

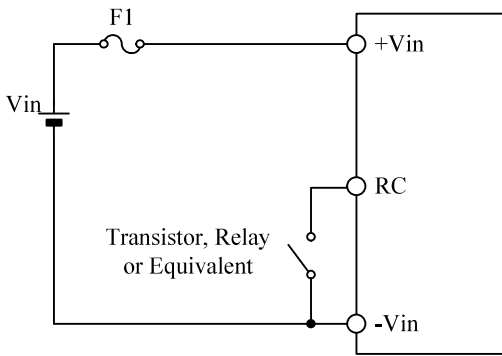


Fig.6-6 RC Connection (1)

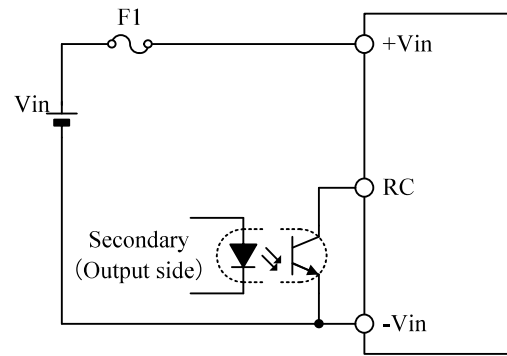


Fig.6-7 RC Connection (2)

Table 6-5 Specification of Remote ON/OFF Control

Connection of RC and -Vin terminal	RC Voltage Range	Output Status
Short	$0V \leq V_{RC} \leq 0.5V$	ON
Open	-	OFF

- Note) 1. When remote ON/OFF control function is not used, between RC and -Vin terminals should be shorted.
 2. In case of applying external voltage into RC terminal, please contact us.
 3. When the wiring from RC terminal to -Vin terminal is long or it is affected by noise, attach capacitor between RC terminal and -Vin terminal. The maximum capacitance of it is 1,000pF.
 4. When selecting external component for using ON/OFF circuit, refer to Table 6-6.
 5. When using opto-coupler for ON/OFF circuit, select one with a small dark current.
 Select opto-coupler with a dark current 50uA or less at 25°C (ambient temperature) or 100uA or less at 100°C (ambient temperature).
 6. Take note that if control ON operation applied before output voltage drops to 0V after control OFF operation, over shoot may occur in the output voltage.

Table6-6 The Maximum Value of Open Voltage of RC Terminal and Source Current (when RC Terminal and -Vin Terminal are Shorted).

model	Open Voltage	Source Current
CCGxxx-12-xxS/D	11V	1.5mA
CCGxxx-24-xxS/D	6.5V	
CCGxxx-48-xxS/D		

6-8. Redundant Operation

Redundant operation is possible for loads that are within the maximum output power of one power supply. When one power supply is shut-down by the power failure etc., another one can continue to provide power.

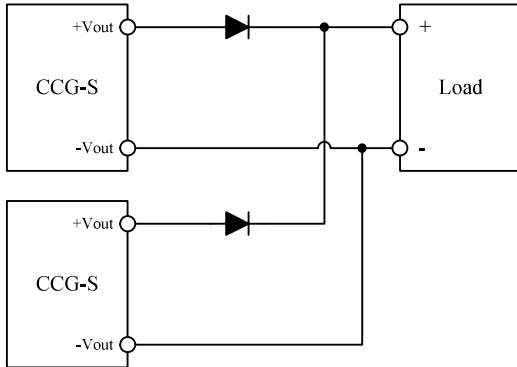


Fig.6-8 Redundant Operation Connection (CCG-S)

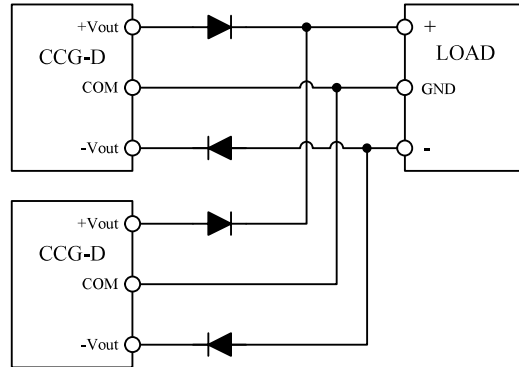


Fig.6-9 Redundant Operation Connection (CCG-D)

6-9. Parallel Operation

Parallel operation cannot be used.

6-10. Series Operation

Series operation is possible for CCG series.

Connections shown in Fig.6-10 and Fig.6-11 are possible.

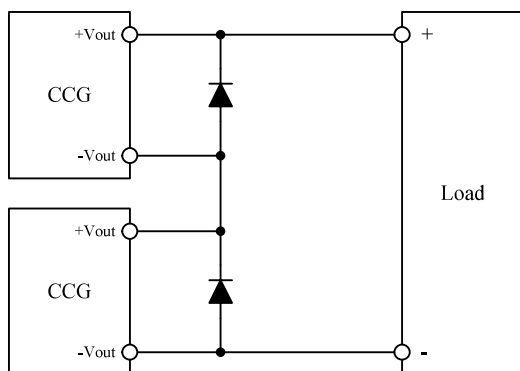


Fig.6-10 Series Operation for High Output Voltage

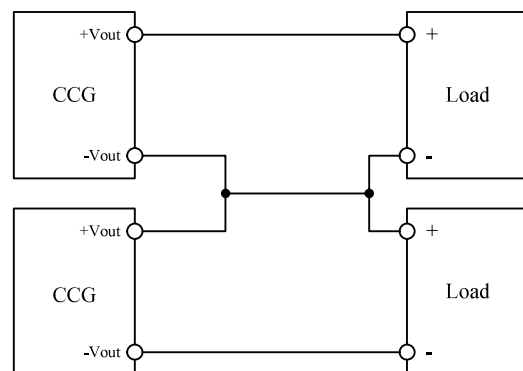


Fig.6-11 ±Output Series Operation

<Reference>

CCG-D can be used as 24V or 30V single output by connecting + Vout and -Vout to the load.

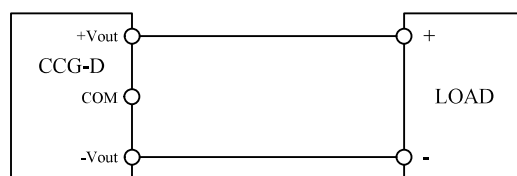


Fig.6-12 Connection when CCG-D single output is used

6-11. Operating Ambient Temperature

Output load needs to be derated depending on the ambient temperature. There is no restriction on mounting direction but there should be enough consideration for airflow so that heat does not accumulate around the power supply vicinity. Determine external components configuration and mounting direction on PCB such that air could flow around the power supply at forced cooling and convection cooling. For better improvement of power supply reliability, derating of ambient temperature is recommended. For details, refer to "7.Output Derating" section.

6-12. Operating Ambient Humidity

Take note that condensation could lead to power supply abnormal operation or damage.

6-13. Storage Ambient Temperature

Take note that sudden temperature change can cause dew condensation.

6-14. Storage Ambient Humidity

Take note that rust would occurred on terminals when stored in high temperature and high humidity environment.

6-15. Withstand Voltage

This power supply is designed to have a withstand voltage of 1.5kVDC or 1.0kVAC between input and output for 1 minute. When conducting withstand voltage test during incoming inspection, set the current limit value of the withstand voltage testing equipment to 20mA. Furthermore, avoid throw in or shut off of the testing equipment when applying or when shutting down the voltage. Instead, gradually increase or decrease the applied voltage. Take note especially when using the timer of the test equipment because when the timer switches the applied voltage off, impulse voltage which has several times the magnitude of the applied voltage is generated causing damage to the power supply. Connect the terminals as shown in Fig.6-13.

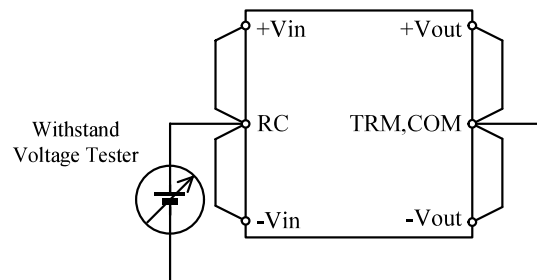


Fig.6-13 Withstand Voltage Test

6-16. Isolation Resistance

Isolation resistance value is $100M\Omega$ and above at 500VDC applied voltage.

Make sure that during testing, the isolation testers do not generate a high pulse when the applied voltage is varied. Ensure that the tester is fully discharged after the test.

Connect the terminals as shown in Fig.6-14.

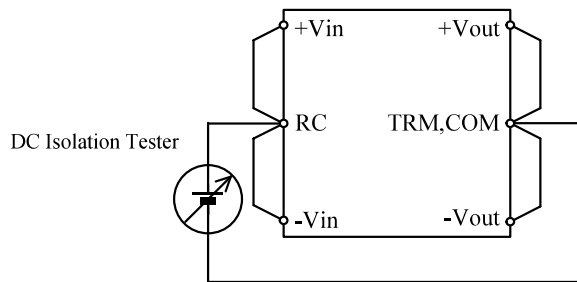


Fig.6-14 Isolation Resistance Test

7. Output Derating

7-1. Output Derating Measurement Method

There is no restriction on mounting direction but there should be enough consideration for airflow so that heat dose not accumulate around the power supply vicinity. Determine external components configuration and mounting direction on PCB such that air could flow around the power supply at forced cooling and conventional cooling. The derating of the output current is necessary when the ambient temperature is high. (See 「7-2. Output Derating Curve」.)

Measurement method of Output Current vs. Ambient Temperature is according to Fig.7-1 and Fig.7-2.

When mounting on actual system, do actual measurement based on measurement points shown in Fig.7-1 and Fig.7-2. Moreover take note that component temperature shown in Fig.7-3 not to exceed the criterion value.

(1) Output Current vs. Ambient Temperature Measurement Method (for convection cooling)

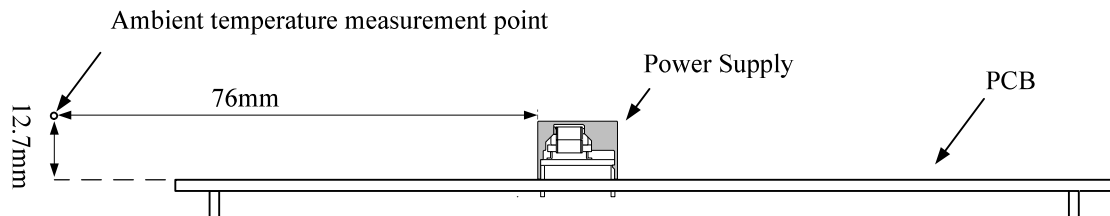


Fig.7-1 Output Current vs. Ambient Temperature Measurement Method (for convection cooling)

(2) Output Current vs. Ambient Temperature Measurement Method (for forced cooling)

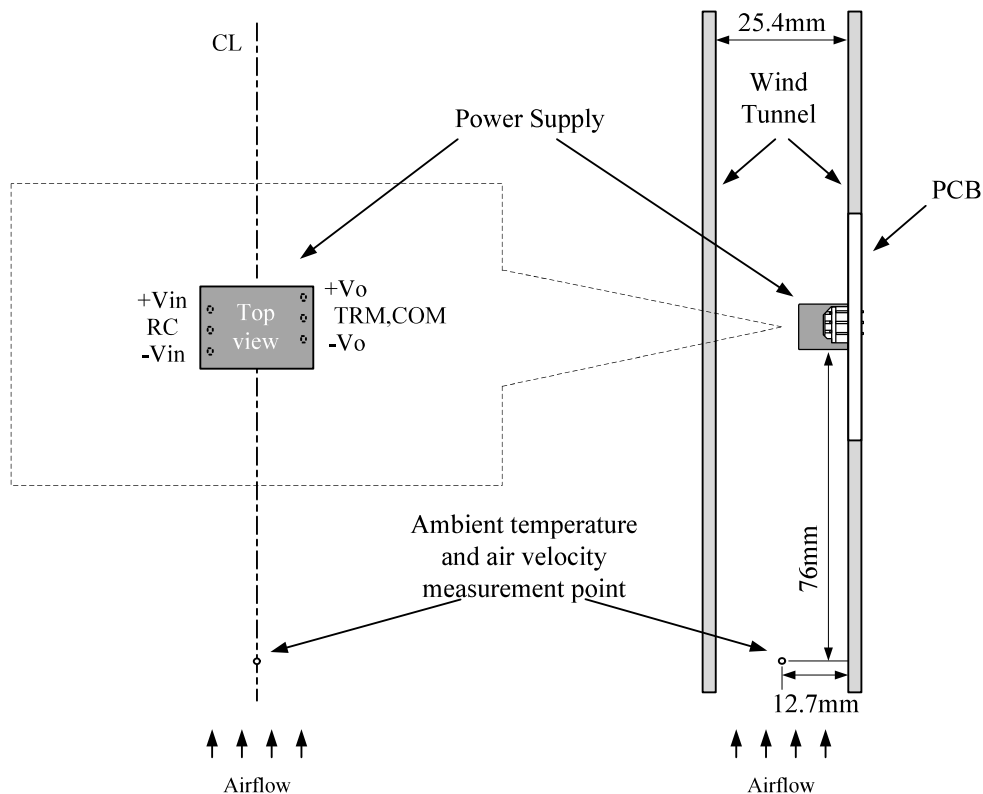


Fig.7-2 Output Current vs. Ambient Temperature Measurement Method (for forced cooling)

(3) Temperature Measurement Points of Component

Confirm the temperature of measurement points (T_c) shown in Fig.7-3 (Center at both sides of transformer core) is below derating curve shown in 「7-2. Output Derating Curve」.

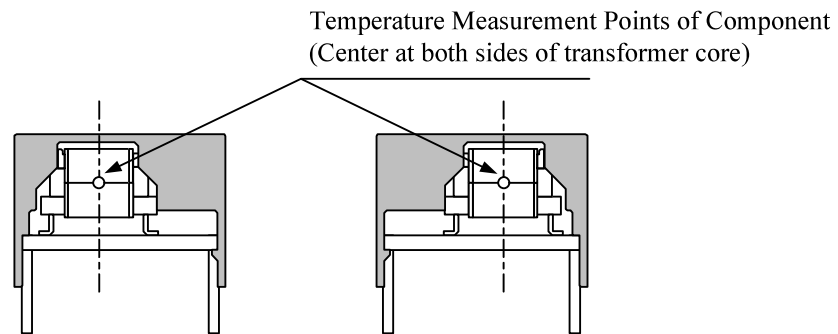


Fig.7-3 Temperature Measurement Point of Component

7-2. Output Derating Curve

Output derating curve described (next page and after) is a measurement data when mounting on our evaluation PCB.

The output derating curve is affected by the mounting board, the external components, and the ambient conditions. Therefore, use it after confirming the temperature that center at both sides of transformer when the power supply operates on actual system does not exceed following derating curve. Moreover, take note that ambient temperature does not exceed following derating curve.

* Evaluation PCB Specification

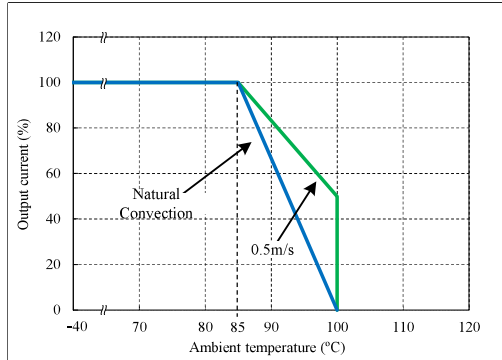
Size	135mm × 50mm t = 1.6mm
Material	FR-4 (Double sided)
Copper	18μm

(1) Output Derating Curve

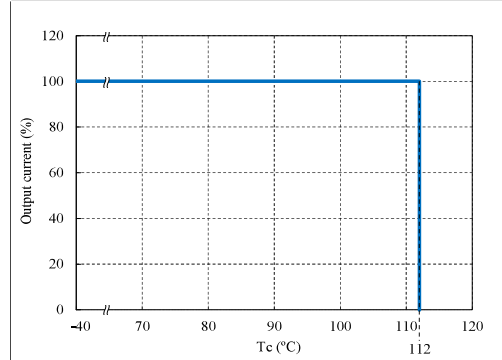
※Data which input voltage range is not described correspond to the full input range.

◆**CCG1R5-12-03S**

Output Current vs. Ambient Temperature

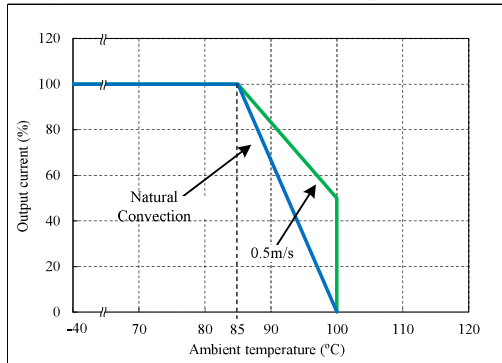


Output Current vs. Tc

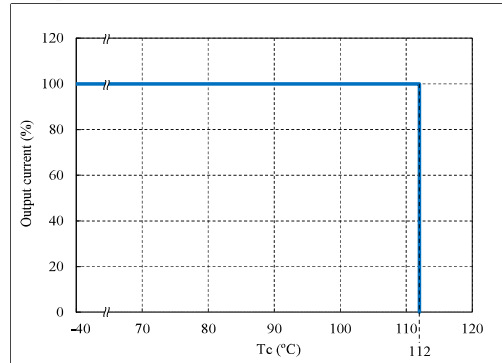


◆**CCG1R5-12-05S**

Output Current vs. Ambient Temperature

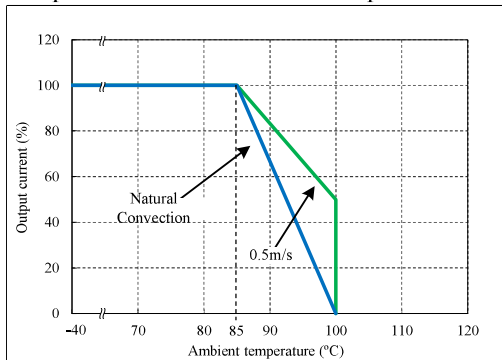


Output Current vs. Tc

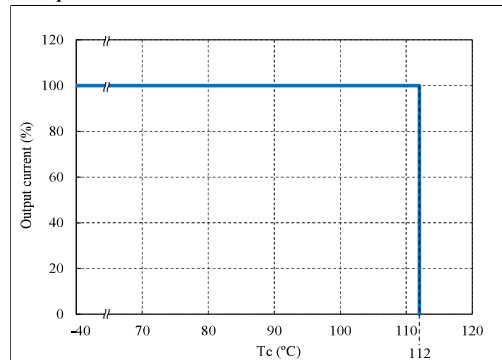


◆**CCG1R5-12-12S**

Output Current vs. Ambient Temperature

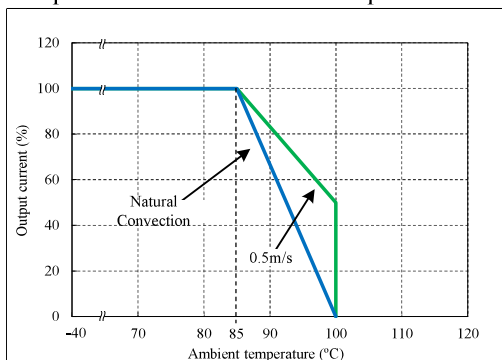


Output Current vs. Tc

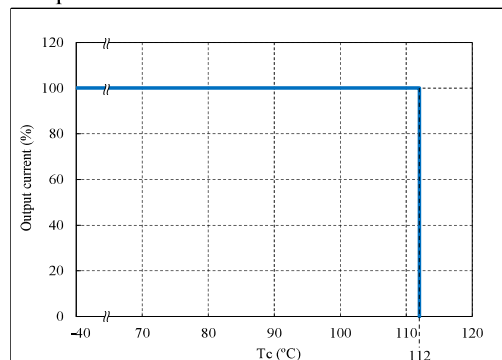


◆**CCG1R5-12-15S**

Output Current vs. Ambient Temperature

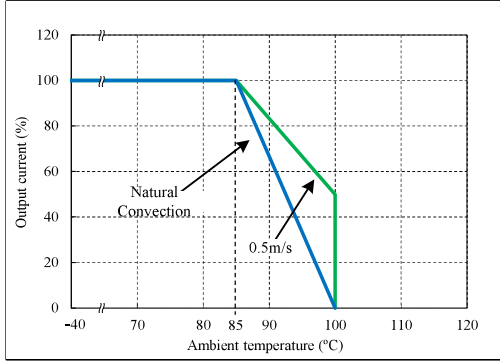


Output Current vs. Tc

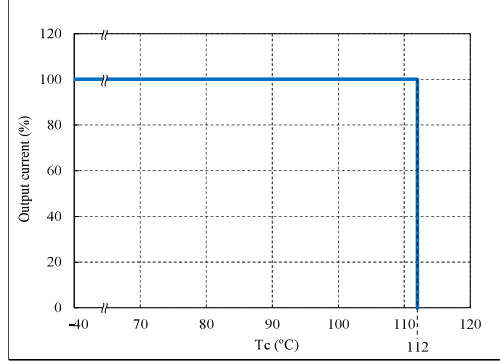


◆**CCG1R5-12-12D**

Output Current vs. Ambient Temperature

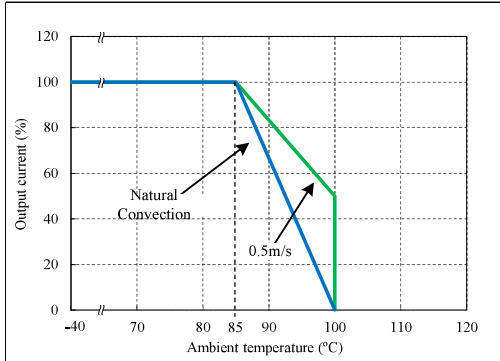


Output Current vs. Tc

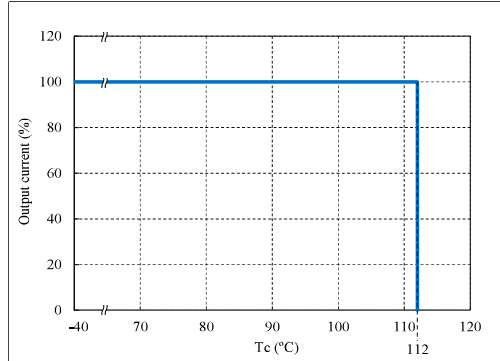


◆**CCG1R5-12-15D**

Output Current vs. Ambient Temperature

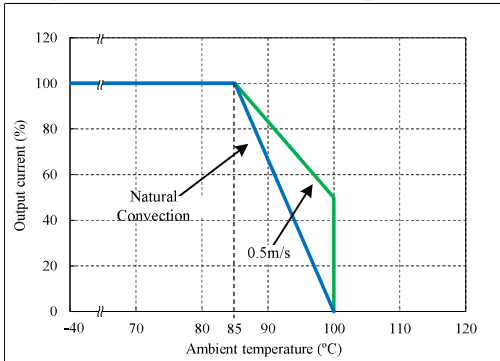


Output Current vs. Tc

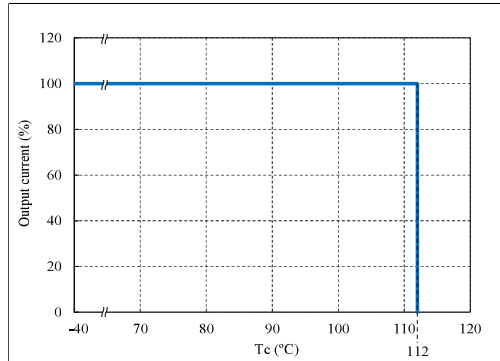


◆**CCG1R5-24-03S**

Output Current vs. Ambient Temperature

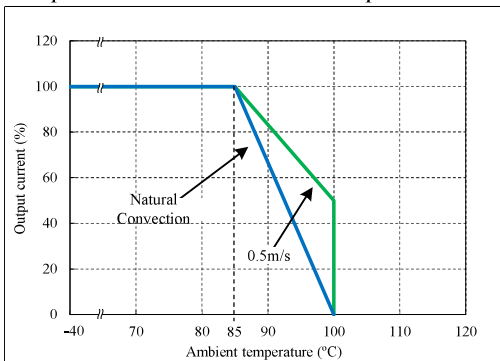


Output Current vs. Tc

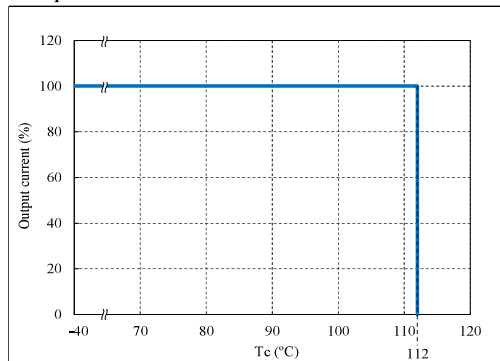


◆**CCG1R5-24-05S**

Output Current vs. Ambient Temperature

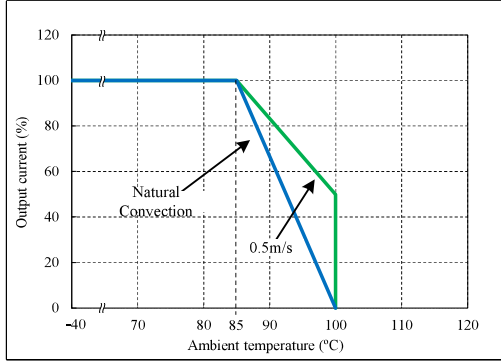


Output Current vs. Tc

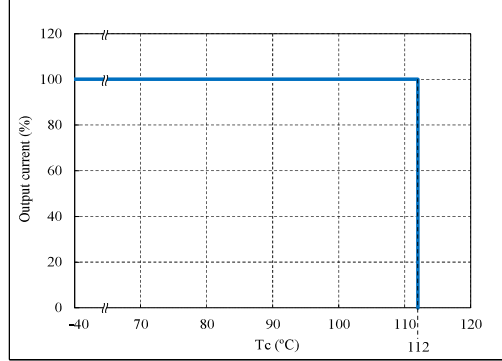


◆**CCG1R5-24-12S**

Output Current vs. Ambient Temperature

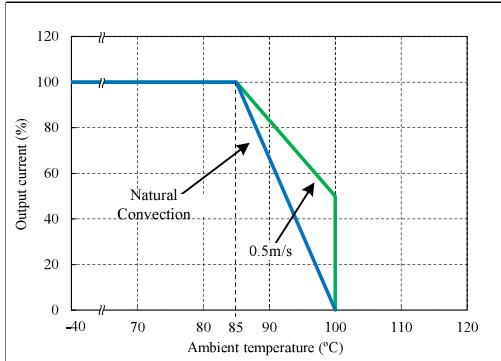


Output Current vs. Tc

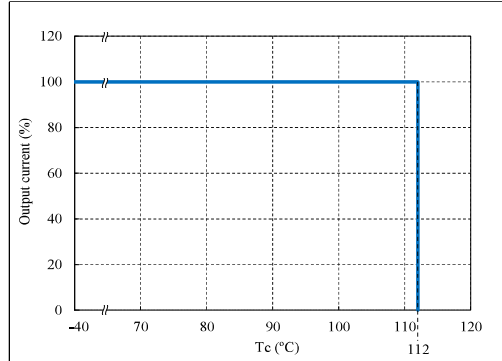


◆**CCG1R5-24-15S**

Output Current vs. Ambient Temperature

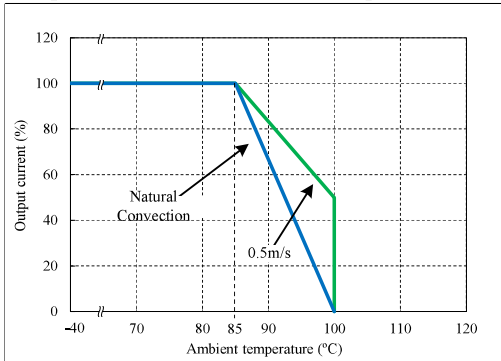


Output Current vs. Tc

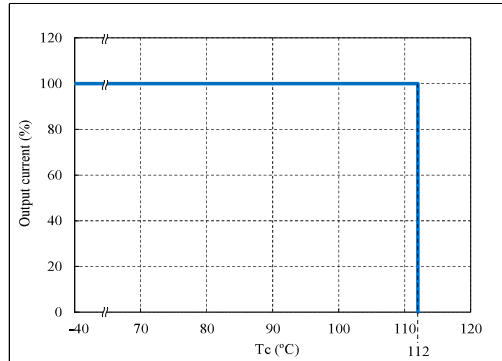


◆**CCG1R5-24-12D**

Output Current vs. Ambient Temperature

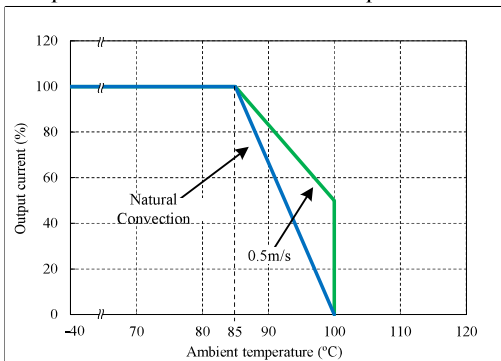


Output Current vs. Tc

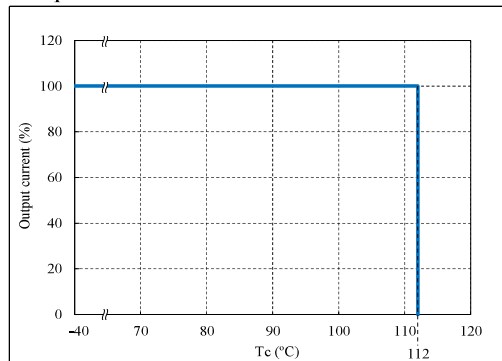


◆**CCG1R5-24-15D**

Output Current vs. Ambient Temperature

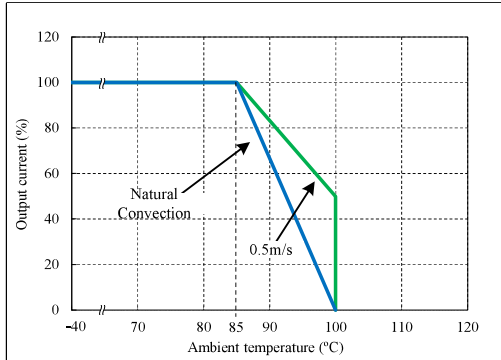


Output Current vs. Tc

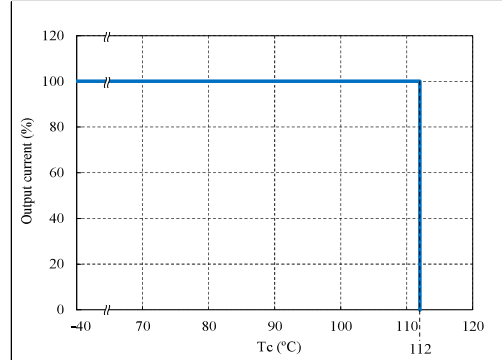


◆**CCG1R5-48-03S**

Output Current vs. Ambient Temperature

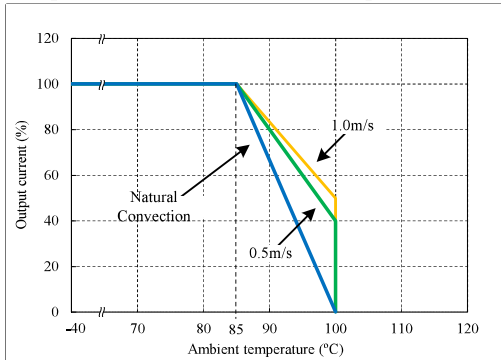


Output Current vs. Tc

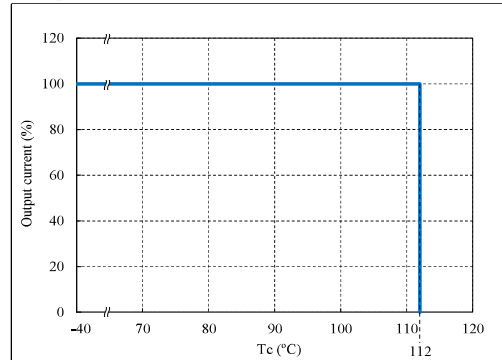


◆**CCG1R5-48-05S**

Output Current vs. Ambient Temperature

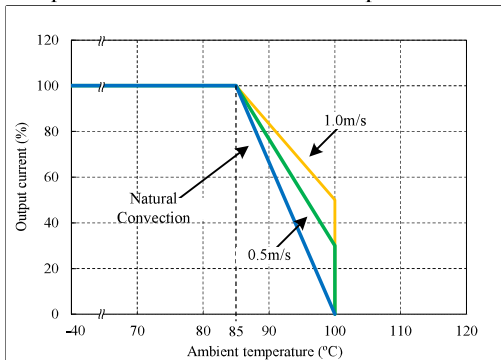


Output Current vs. Tc

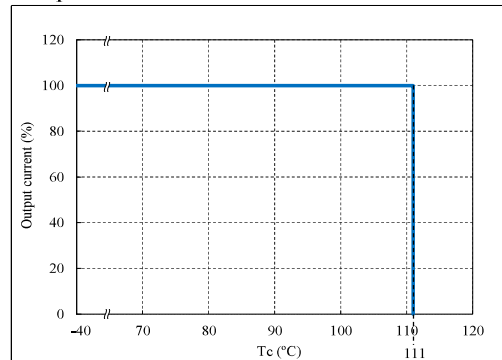


◆**CCG1R5-48-12S**

Output Current vs. Ambient Temperature

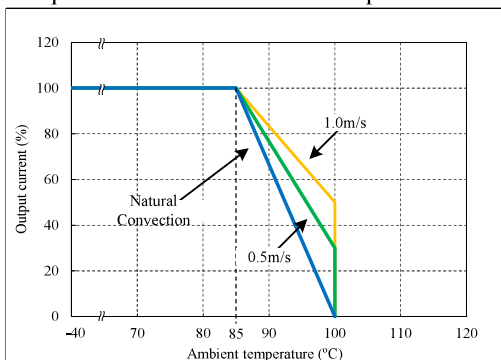


Output Current vs. Tc

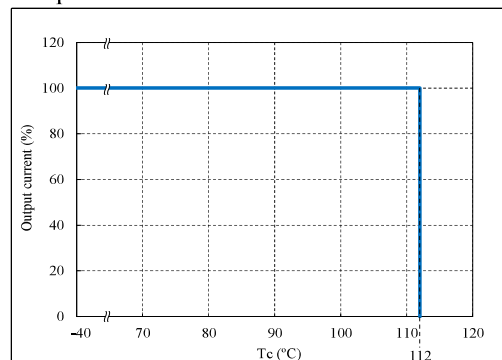


◆**CCG1R5-48-15S**

Output Current vs. Ambient Temperature

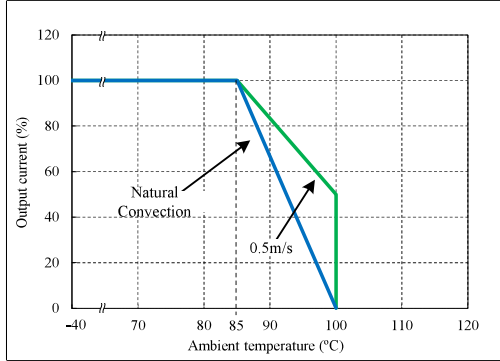


Output Current vs. Tc

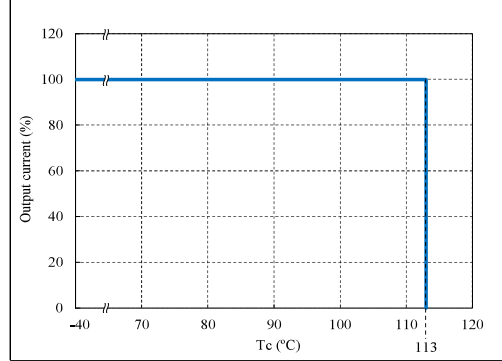


◆**CCG1R5-48-12D**

Output Current vs. Ambient Temperature

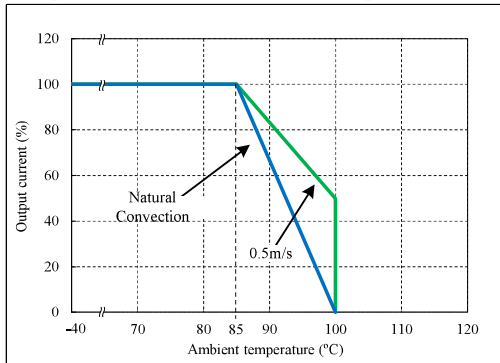


Output Current vs. Tc

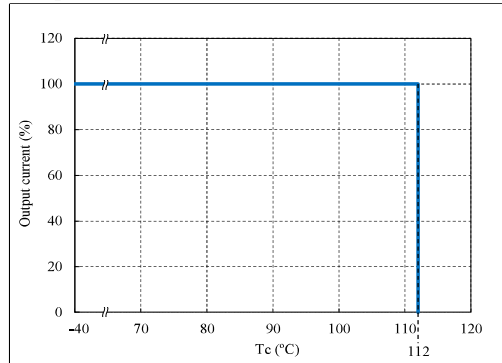


◆**CCG1R5-48-15D**

Output Current vs. Ambient Temperature

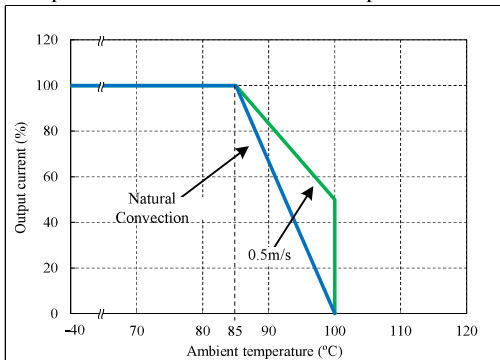


Output Current vs. Tc

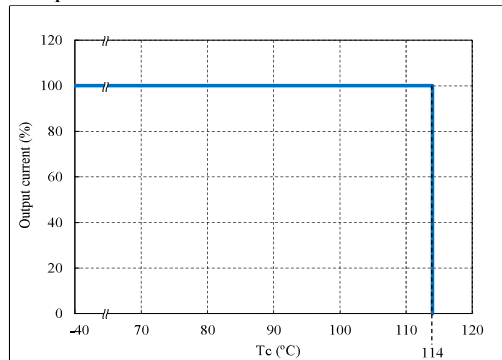


◆**CCG3-12-03S**

Output Current vs. Ambient Temperature

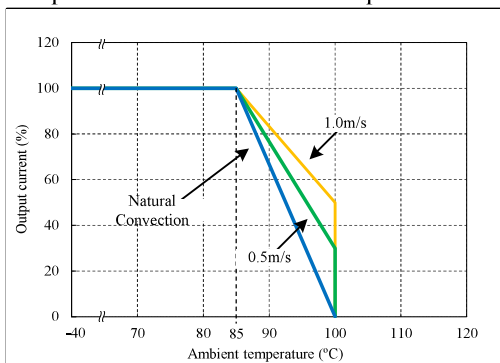


Output Current vs. Tc

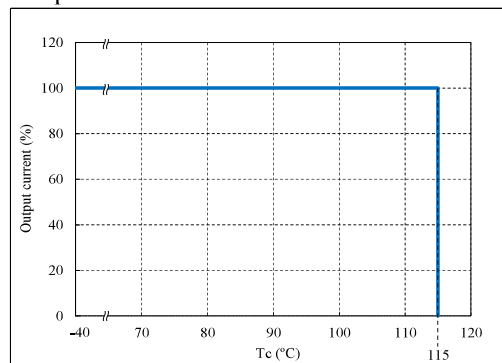


◆**CCG3-12-05S**

Output Current vs. Ambient Temperature

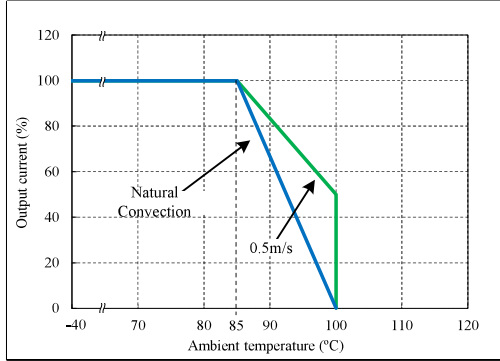


Output Current vs. Tc

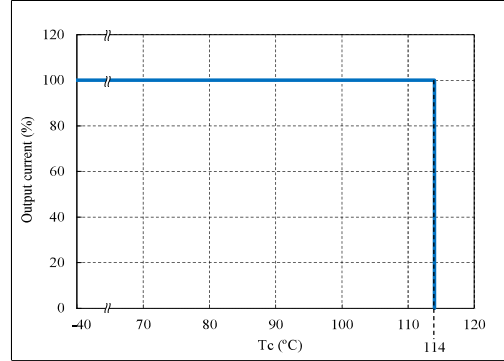


◆**CCG3-12-12S**

Output Current vs. Ambient Temperature

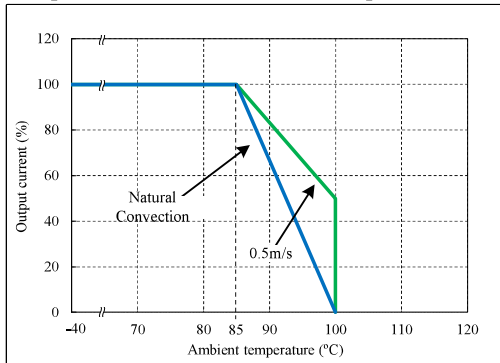


Output Current vs. Tc

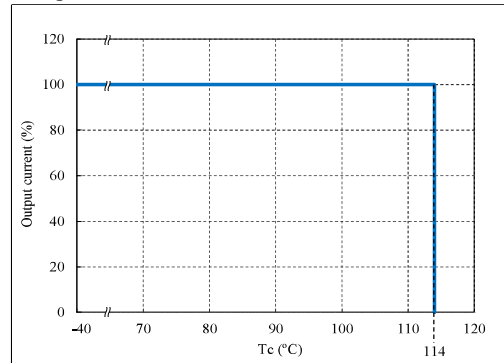


◆**CCG3-12-15S**

Output Current vs. Ambient Temperature

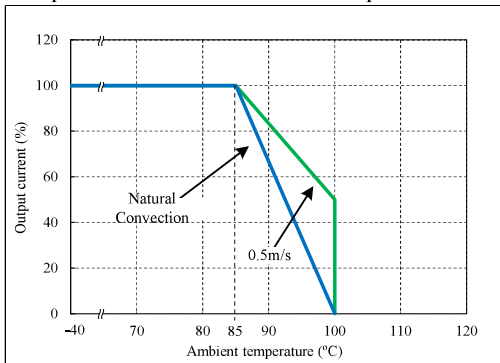


Output Current vs. Tc

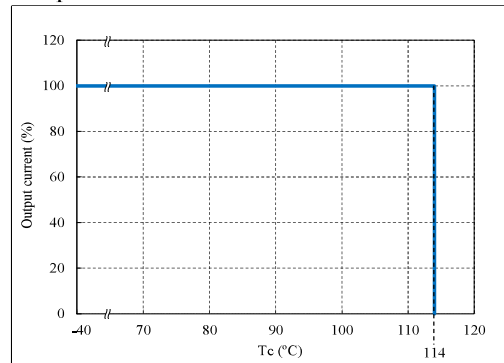


◆**CCG3-12-12D**

Output Current vs. Ambient Temperature

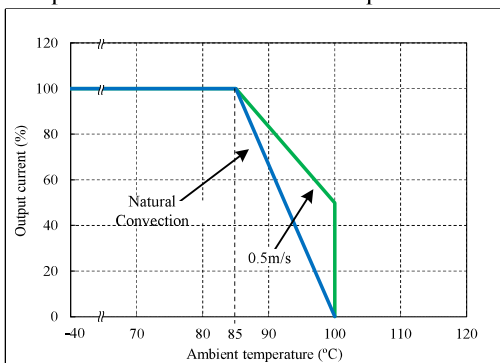


Output Current vs. Tc

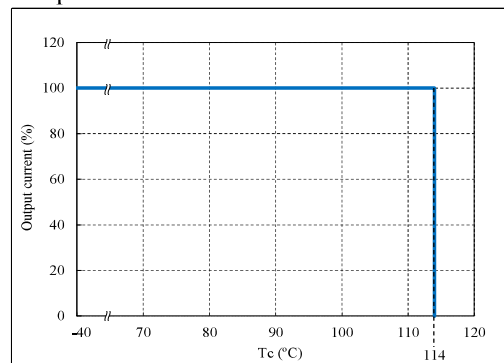


◆**CCG3-12-15D**

Output Current vs. Ambient Temperature

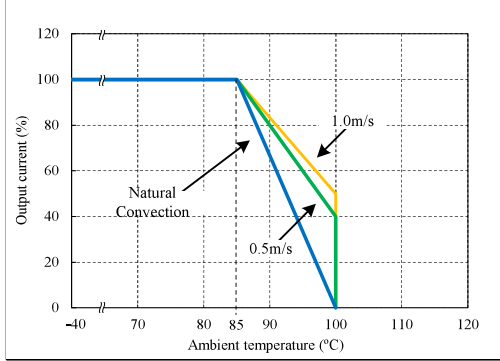


Output Current vs. Tc

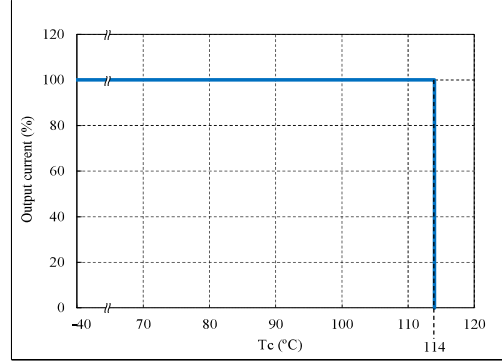


◆**CCG3-24-03S**

Output Current vs. Ambient Temperature

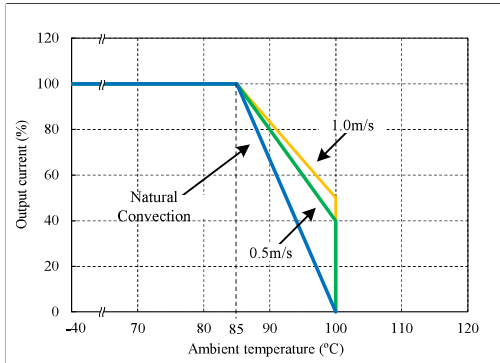


Output Current vs. Tc

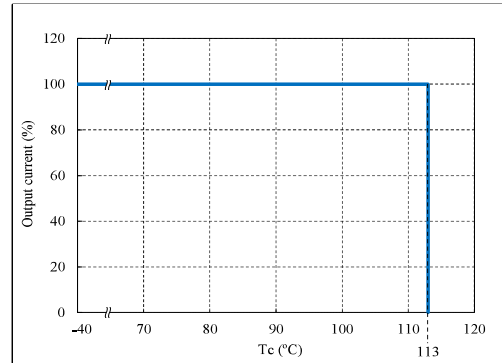


◆**CCG3-24-05S**

Output Current vs. Ambient Temperature

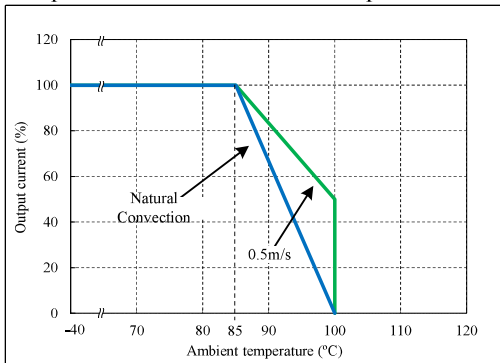


Output Current vs. Tc

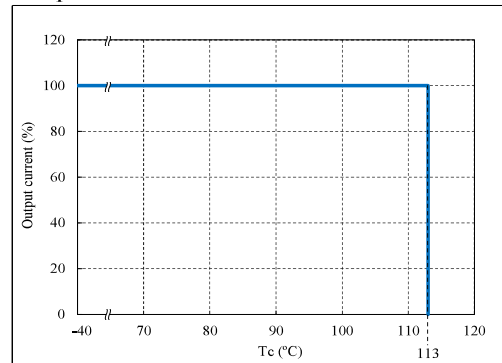


◆**CCG3-24-12S**

Output Current vs. Ambient Temperature

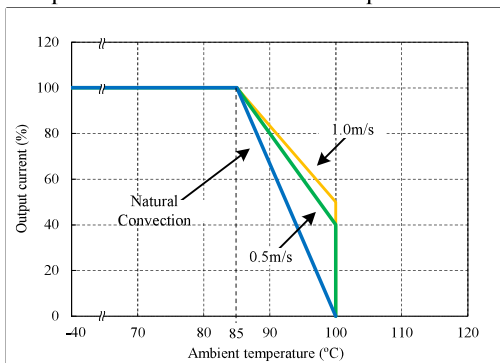


Output Current vs. Tc

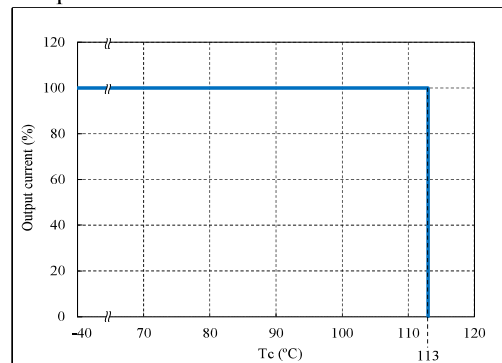


◆**CCG3-24-15S**

Output Current vs. Ambient Temperature

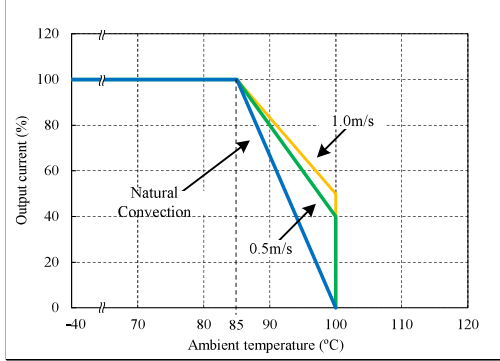


Output Current vs. Tc

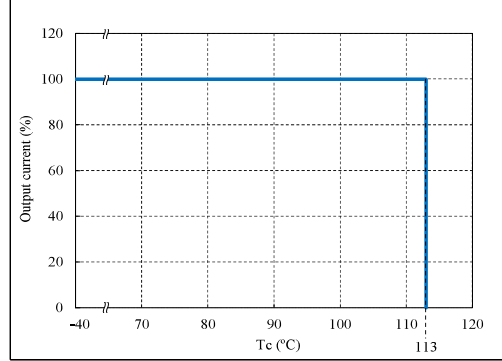


◆**CCG3-24-12D**

Output Current vs. Ambient Temperature

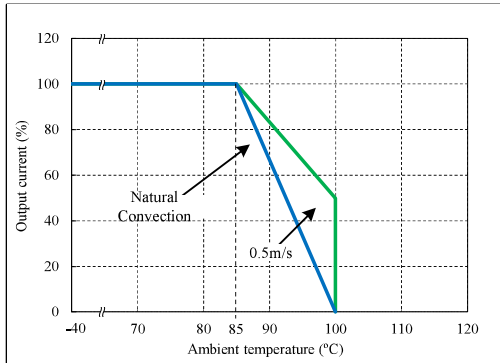


Output Current vs. Tc

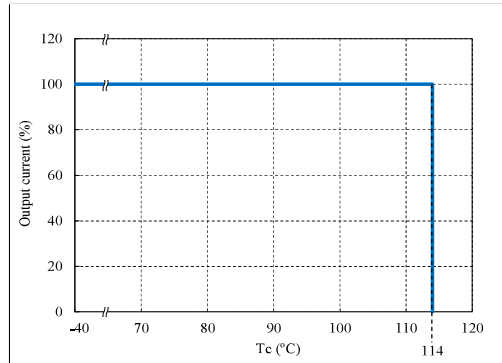


◆**CCG3-24-15D**

Output Current vs. Ambient Temperature

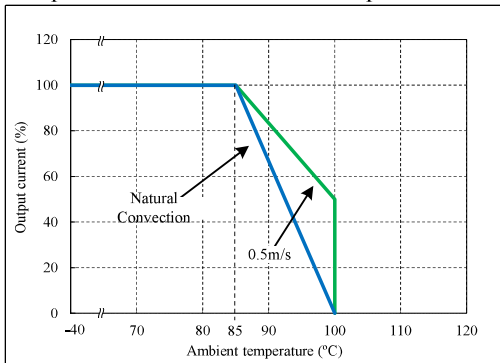


Output Current vs. Tc

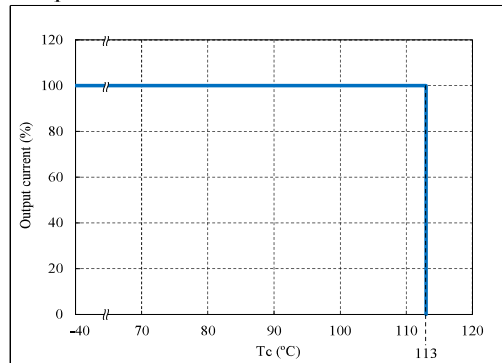


◆**CCG3-48-03S (18V ≤ Vin ≤ 36V)**

Output Current vs. Ambient Temperature

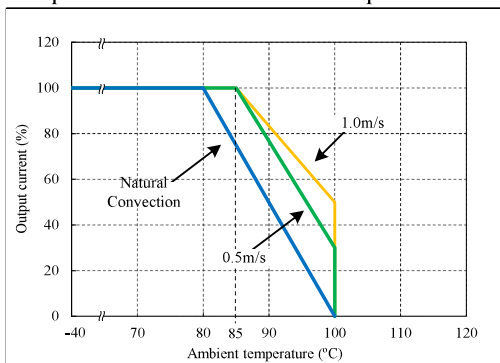


Output Current vs. Tc

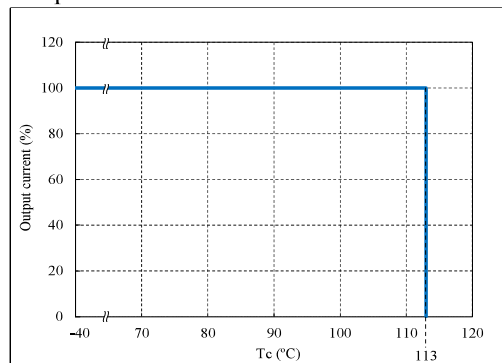


(36V < Vin ≤ 76V)

Output Current vs. Ambient Temperature

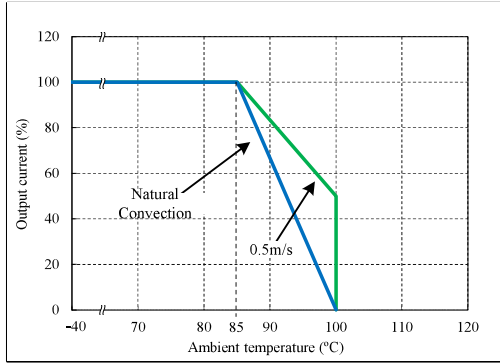


Output Current vs. Tc

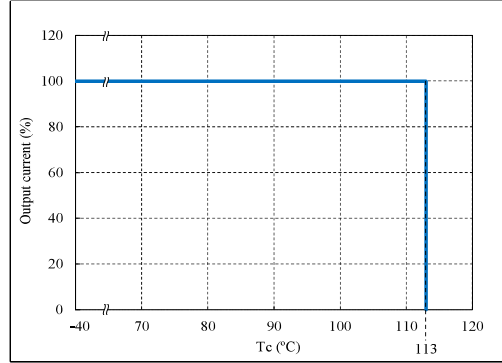


◆ **CCG3-48-05S** ($18V \leq V_{in} \leq 36V$)

Output Current vs. Ambient Temperature

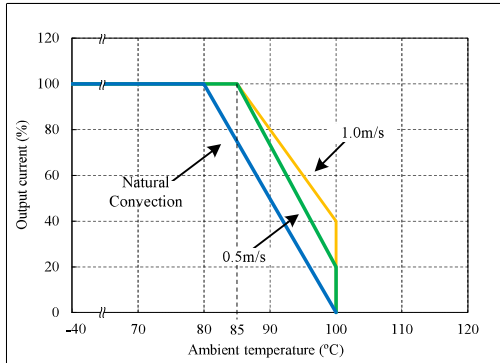


Output Current vs. Tc

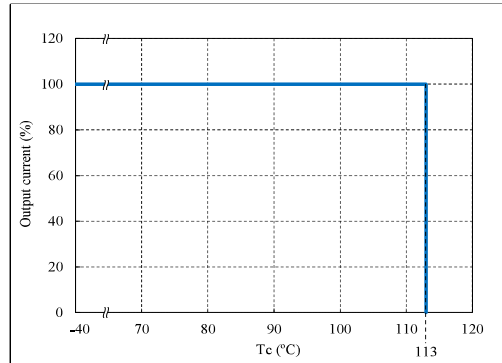


($36V < V_{in} \leq 76V$)

Output Current vs. Ambient Temperature

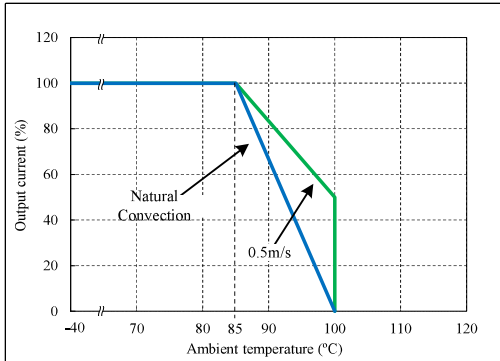


Output Current vs. Tc

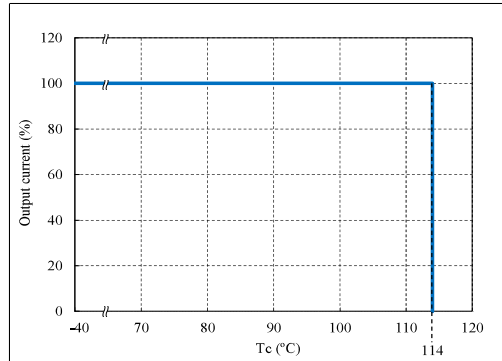


◆ **CCG3-48-12S**

Output Current vs. Ambient Temperature

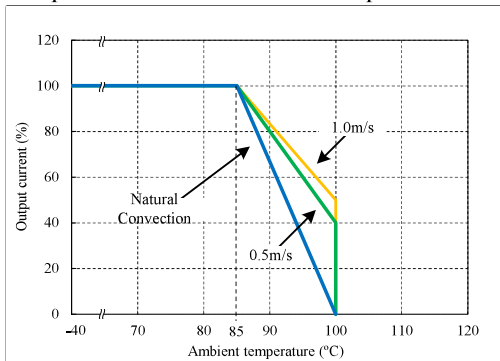


Output Current vs. Tc

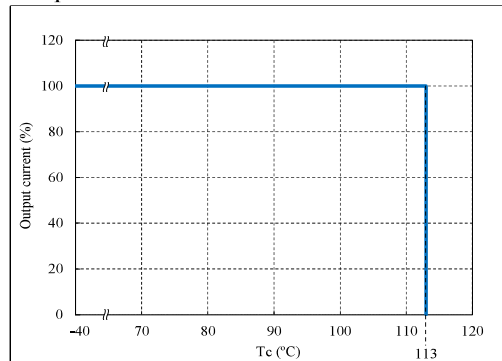


◆ **CCG3-48-15S**

Output Current vs. Ambient Temperature

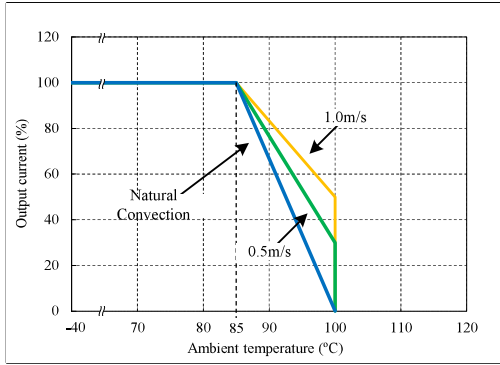


Output Current vs. Tc

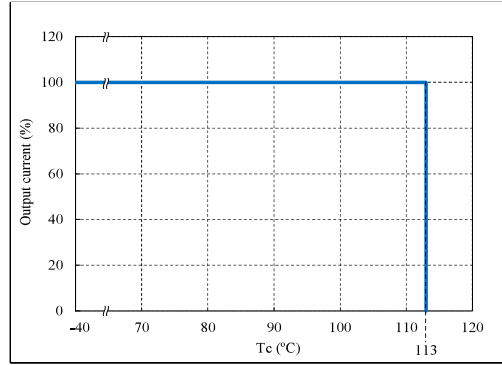


◆CCG3-48-12D

Output Current vs. Ambient Temperature

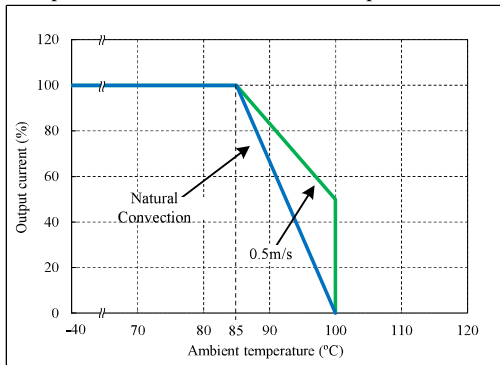


Output Current vs. Tc

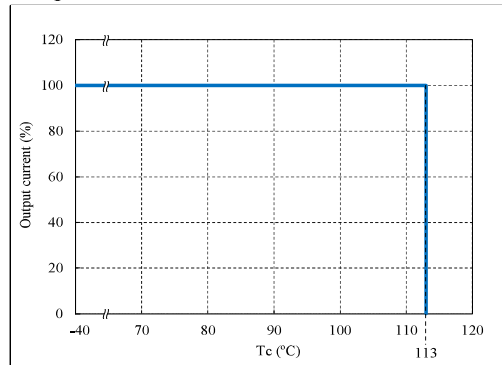


◆CCG3-48-15D

Output Current vs. Ambient Temperature



Output Current vs. Tc



8. Mounting Method, Soldering and Cleaning Condition

8-1. Mounting Method

(1) Mounting Dimension

[DIP type]

Below is the recommended size of hole and land of PCB in Table 8-1.

The mounting hole position is shown in Fig.8-1.

Table 8-1 Recommended Diameter of Hole and Land

Terminal pin size	0.7×0.5mm
Hole diameter	φ 1.2mm
Land diameter	φ 2.0mm

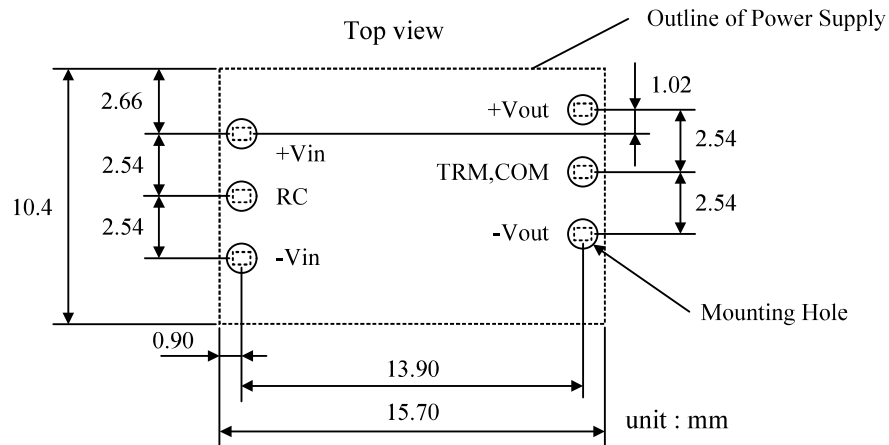


Fig.8-1 Recommended Mounting Dimension (DIP type)

[SMD type]

There is the recommended pad size of PCB in Table 8-2.

The mounting pad position is shown in Fig.8-2.

Table 8-2 Recommended Pad

Terminal pin size	2.25×0.5mm
Pad size	3.60×1.30mm

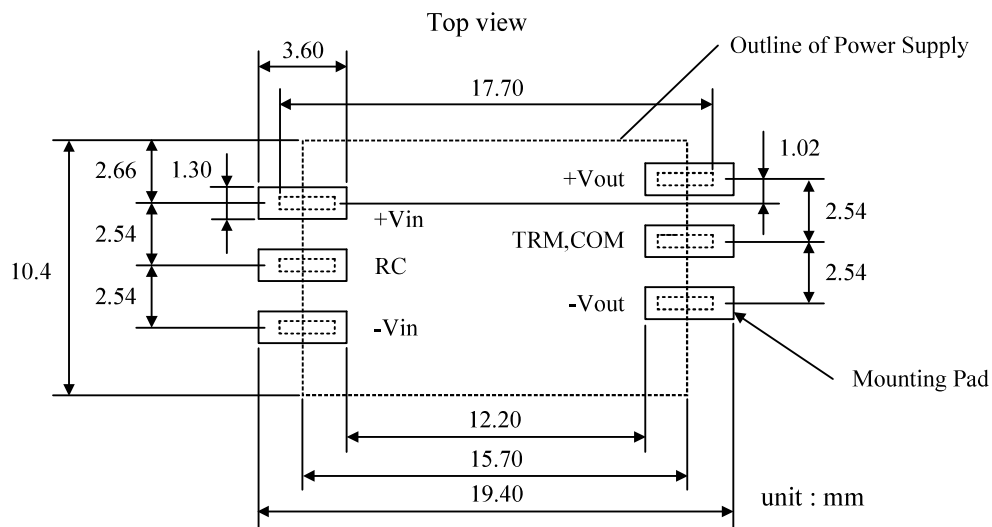




Fig.8-2 Recommended Mounting Dimension (SMD type)

※See outline drawing for outline of the power supply.

(2) Prohibition Area of Pattern Wiring

When power supply mount on PCB, avoid wiring pattern to prohibition area as shown in Fig.8-3. Because there is a possibility to occur insulation failure.

When wiring signal pattern under the power supply even in non-prohibition area, evaluate enough on actual system because it is susceptible to noise.

- ①  : Wiring prohibition area of secondary circuit pattern
- ②  : Wiring prohibition area of primary circuit pattern

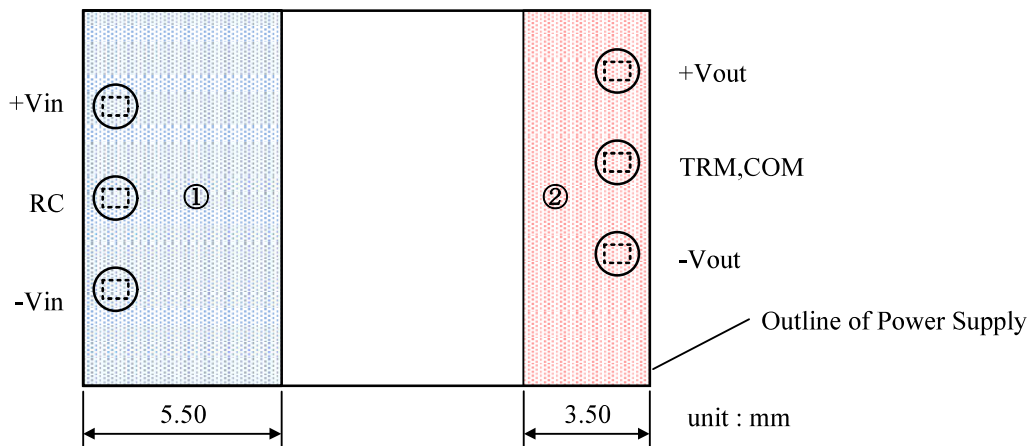


Fig.8-3 Prohibition Area of Pattern Wiring

(3) Recommended Material of PCB

Recommended materials of the printed circuit board is double sided glass epoxy with through holes. (thickness : 1.6mm, copper : 18μm or more)

(4) Input / Output Pattern Width

Large current flows through input and output pattern. If pattern width is too narrow, heat on pattern will increase because of voltage drop of pattern. Relationship between allowable current and pattern width varies depending on materials of printed circuit board, thickness of conductor and allowable temperature rise of pattern, etc. It is definitely necessary to confirm on manufactures of printed circuit board for designing pattern.

(5) Method of Connecting Terminals

Connect +Vin, -Vin, RC, +Vout, -Vout, TRIM/COM with consideration of contact resistance. On CCG1R5 and CCG3, there is a possibility of reverse mounting (it means that input and output terminals are opposite orientation) might happen as shown in Fig.8-4.

Power supply would be damaged when input voltage was applied it of reverse mounting situation. Prevent reverse mounting by confirming +Vin terminal marking and orientation of words printed on case as shown in Fig.8-5.

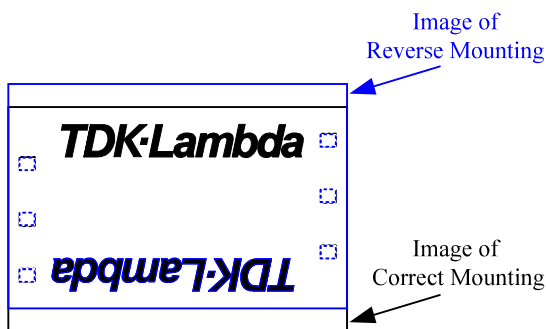


Fig.8-4 Image of Reverse Mounting

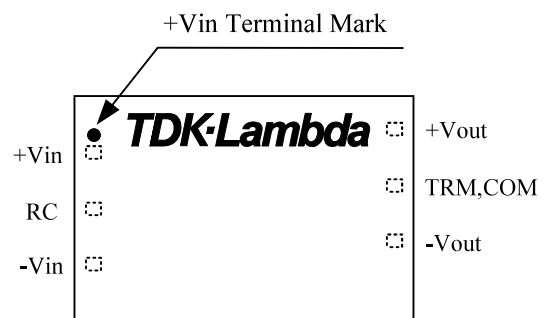


Fig.8-5 Printed Image of +Vin Terminal Marking and words

8-2. Recommended Soldering Condition

Recommended soldering conditions are as follows.

(1) Soldering Dip

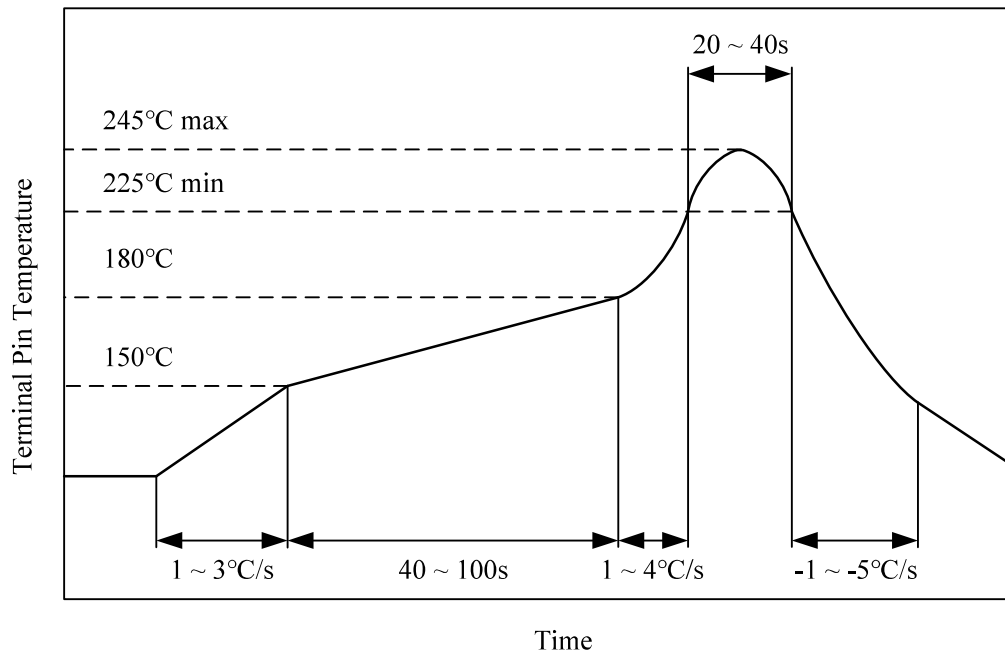
Dip condition : 260°C within 10 seconds

Pre-heat condition : 110°C for 30 ~ 40 seconds

(2) Soldering SMD

Allowable number of Reflow : 1 time

MSL(Moisture Sensitivity Level) : Equivalent to 1



(3) Soldering Iron

350°C within 3 seconds

Note) Soldering time changes according to heat capacity of soldering iron, pattern on printed circuit board etc. Please confirm actual performance.

8-3. About Cleaning

Cleaning is not recommended.

9. Before Concluding Power Module Damage

Verify following items before concluding power supply damage.

(1) No output voltage

- Is specified input voltage applied?
- Are the remote ON/OFF control terminal (RC), output voltage trimming terminal (TRM) correctly connected?
- For case where output voltage adjustment is used, is resistor or variable resistor setting, connections correctly done?
- Are there no abnormalities in the output load used?
- Is the temperature of measurement point (Tc) as shown in Fig.7-3 within the specified temperature range?
- Is the ambient temperature within the specified temperature range?

(2) Output voltage is high

- For case where output voltage adjustment is used, is resistor or variable resistor setting, connections correctly done?
- Is the ambient temperature within the specified temperature range?

(3) Output voltage is low

- Is specified input voltage applied?
- For cases where output voltage adjustment is used, is resistor or variable resistor setting, connections correctly done?
- Are there no abnormalities in the output load used?

(4) Load regulation or line regulation is large

- Is specified input voltage applied?
- Are the input terminals and the output terminals firmly connected?
- Is the input or output wire too thin?
- Is the input or output wire too long?

(5) Output ripple voltage is large

- Is the measurement done according to methods described in the Instruction Manual or is it an equivalent method?
- Is the input ripple voltage value within the specified value?

10. Warranty Period

Warranty period is 5 years.

For damages occurring at normal operation within this warranty period, exchange is free of charge.

Please read the General Safety Instruction before using the products.

11. CE MARKING / UKCA MARKING

CE MARKING

CE Marking, when applied to a product or packing material for a product covered by this handbook, CCGxxx-12-xxS/D, CCGxxx-24-xxS/D indicates compliance with RoHS Directive, CCGxxx-48-xxS/D indicates compliance with Low Voltage Directive and RoHS Directive.

UKCA MARKING

UKCA Marking, when applied to a product or packing material for a product covered by this handbook, indicates compliance with the Electrical Equipment (Safety) Regulations and Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment Regulations.