TDK·Lambda

DPX30-xxWSxx DC-DC Converter Module

10 ~ 40VDC, 18 ~ 75VDC input; 3.3 to 28VDC Single Output
30 Watts Output Power

FEATURES

- NO MINIMUM LOAD REQUIRED
- 1600VDC INPUT TO OUTPUT ISOLATION
- SCREW TERMINALS FOR INPUT AND OUTPUT CONNECTIONS
- RELIABLE SNAP-ON FOR DIN RAIL TS-35/7.5 OR TS-35/15
- CASE PROTECTION MEETS IP20(IEC60529)
- INPUT FUSE PROTECTION
- INPUT REVERSE POLARITY PROTECTION
- INPUT IN-RUSH CURRENT LIMIT CIRCUIT
- OUTPUT DC-OK INDICATOR
- 4:1 WIDE INPUT VOLTAGE RANGE
- FIXED SWITCHING FREQUENCY
- INPUT UNDER-VOLTAGE PROTECTION
- OUTPUT OVER-VOLTAGE PROTECTION
- OVER-CURRENT PROTECTION
- OUTPUT SHORT CIRCUIT PROTECTION
- MEETS EN55022 CLASS B
- COMPLIANT TO RoHS II & REACH

RoHS Compliant

CE

CE MARKED
SAFETY MEETS: UL60950-1
EN60950-1
IEC60950-1

APPLICATIONS

- COMMUNICATION SYSTEMS
- INDUSTRY CONTROL SYSTEMS
- FACTORY AUTOMATIC EQUIPMENT
- SEMICONDUCTOR EQUIPMENT

OPTIONS

- REMOTE ON/OFF

GENERAL DESCRIPTION

The DPX30-xxWSxx series was designed to offer easy installation with snap-on type mounting to a DIN-rail. Internal protection circuits such as input voltage reversal and in-rush current limit protection, as well as output short-circuit, over-current protection and over-voltage protection. A green LED at the front displays the status of the output.

Contents

Output Specifications					
Parameter	Model	Min	Typ	Max	Unit
Output Voltage					
(Vin(nom); Full Load; Ta=25℃)	xxWS3P3	3.251	3.3	3.349	
	xxWS05	4.95	5	5.05	
	xxWS12	11.88	12	12.12	VDC
	xxWS15	14.85	15	15.15	
	xxWS24	23.76	24	24.24	
	xxWS28	27.72	28	28.28	
Output Regulation					
Line (Vin(min) to Vin(max); Full Load)	All	-0.5		+0.5	%
Load (0% to 100% of Full Load)	xxWS3P3	-1.5		+1.5	
	Others	-1.0		+1.0	
Output Ripple and Noise					
Peak to Peak (20MHz Bandwidth)	xxWS3P3		50	75	
	xxWS05		50	75	
	xxWS12		75	100	mVp-p
	xxWS15		75	100	
	xxWS24		130	160	
	xxWS28		130	160	
Voltage Adjustability					
	xxWS28	-3		+17	% of Vout
	Others	-10		+10	
Temperature Coefficient	All	-0.02		+0.02	%/℃
Output Voltage Overshoot					% of Vout
(Vin(min) to Vin(max) Full Load; Ta=25℃)	All		0	5	
Dynamic Load Response					
(Vin(nom); Ta=25℃)					
Load step change from					
75% to 100% or 100 to 75% of Full Load					
Peak Deviation	All		250		mV
Setting Time (Vo＜10% peak deviation)	All		250		μs
Output Current					
	xxWS3P3	0		6	
	xxWS05	0		6	
	xxWS12	0		2.5	A
	xxWS15	0		2	
	xxWS24	0		1.25	
	xxWS28	0		1	
Output Capacitance Load					
	xxWS3P3			19500	
	xxWS05			10200	
	xxWS12			3300	μF
	xxWS15			1100	
	xxWS24			500	
	xxWS28			340	
Output Over Voltage Protection (see page 32)					
(Zener diode clamp)	xxWS3P3		3.9		
	xxWS05		6.2		
	xxWS12		15		VDC
	xxWS15		18		
	xxWS24		30		
	xxWS28		36		
Output Indicator	All	Green LED			
Output Over Current Protection (see page 32)					% of FL
(% of Iout rated; Hiccup mode)	All			150	
Output Short Circuit Protection (see page 32)	All	Continuous, automatic recovery			

Input Specifications					
Parameter	Model	Min	Typ	Max	Unit
Operating Input Voltage					
Continuous	24WSxx	10	24	40	VDC
	48WSxx	18	48	75	
Transient (100ms,max)	24WSxx			50	
	48WSxx			100	
Input Standby Current					
(Vin(nom); No Load)	24WS3P3		52		mA
	24WS05		67		
	24WS12		69		
	24WS15		75		
	24WS24		39		
	24WS28		45		
	48WS3P3		32		
	48WS05		32		
	48WS12		38		
	48WS15		48		
	48WS24		30		
	48WS28		30		
Under Voltage Lockout Turn-on Threshold	24WSxx			10	VDC
	48WSxx			18	
Under Voltage Lockout Turn-off Threshold	24WSxx		8		VDC
	48WSxx		16		
Input Reflected Ripple Current (see page 30) (Vin(nom); Full Load)	All		15		mAp-p
Start Up Time (Vin(nom) and constant resistive load)	All				ms
Power up			100		
Remote ON/OFF			20		
Remote ON/OFF Control (see page 31) (The Ctrl pin voltage is referenced to negative input)					
Positive Logic (Optional)					
On/Off pin High Voltage (Remote ON)	xxWSxx-P		Open or 3 ~ 12VDC		
On/Off pin Low Voltage (Remote OFF)			Short or 0 ~ 1.2VDC		
Negative Logic (Optional)					
On/Off pin Low Voltage (Remote ON)	xxWSxx-**N**		Short or 0 ~ 1.2VDC		
On/Off pin High Voltage (Remote OFF)			Open or 3 ~ 12VDC		
Input Current of Remote Control Pin	All	-0.5		0.5	mA
Remote Off State Input Current	All		3		mA
Input Fuse (Slow Blow)	24WSxx		6		A
	48WSxx		4		
In-rush Current	All		15		A

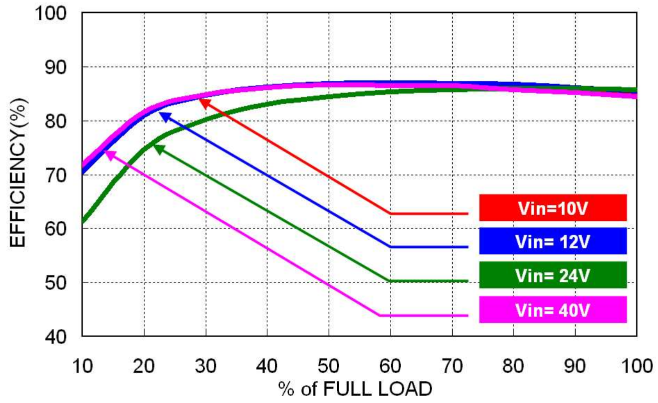
General Specifications					
Parameter	Model	Min	Typ	Max	Unit
Efficiency					
(Vin(nom); Full Load; Ta=25℃)	24WS3P3		85		
	24WS05		85		
	24WS12		85		
	24WS15		86		
	24WS24		82		
	24WS28		83		%
	48WS3P3		85		
	48WS05		86		
	48WS12		85		
	48WS15		86		
	48WS24		83		
	48WS28		84		
Isolation Voltage (1 minute)					
Input to Output	All	1600			VDC
Input to Chassis, Output to Chassis		1600			
Isolation Resistance (500VDC)	All	1			GΩ
Isolation Capacitance	All			4000	pF
Switching Frequency	All	270	300	330	kHz
Safety Meets	All		IEC60950-1,UL60950-1, EN60950-1		
Weight	All		170		g
MTBF (see page 33) MIL-HDBK-217F Ta=25ºC, Full load	All		$8.412x 10^5$		hours
Chassis Material	All		Aluminum		

Environmental Specifications						
Parameter		Model	Min	Typ	Max	Unit
Operating Ambient Temperature	Without derating	All	-40		+65	℃
	With derating	All	+65		+99	℃
Storage Temperature		All	-40		105	℃
Relative Humidity		All	5		95	% RH
Thermal Shock		All		MIL-STD-810F		
Vibration		All		IEC60068-2-6		

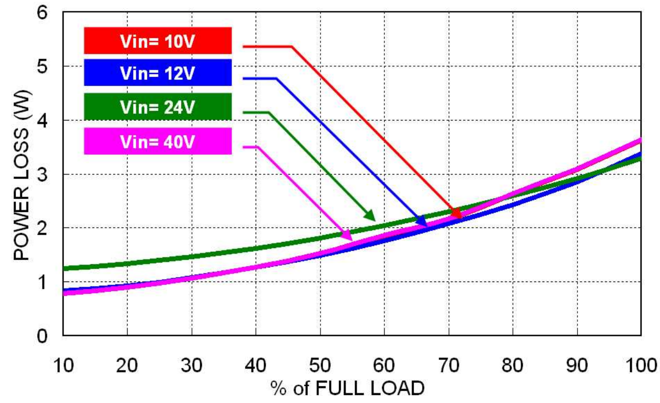
EMC Characteristics			
Characteristic	Standard	Condition	Level
EMI	EN55022	Module stand-alone	Class B
ESD	EN61000-4-2	Air ±8kV Contact ±6kV	Perf. Criteria A
Radiated Immunity	EN61000-4-3	10V/m	Perf. Criteria A
Fast Transient (see page 32)	EN61000-4-4	±2kV	Perf. Criteria A
Surge (see page 32)	EN61000-4-5	±1kV	Perf. Criteria A
Conducted Immunity	EN61000-4-6	10V r.m.s	Perf. Criteria A
Power Frequency Magnetic Field	EN61000-4-8	100A/m continuous; 1000A/m 1 second	Perf. Criteria A

Characteristic Curves

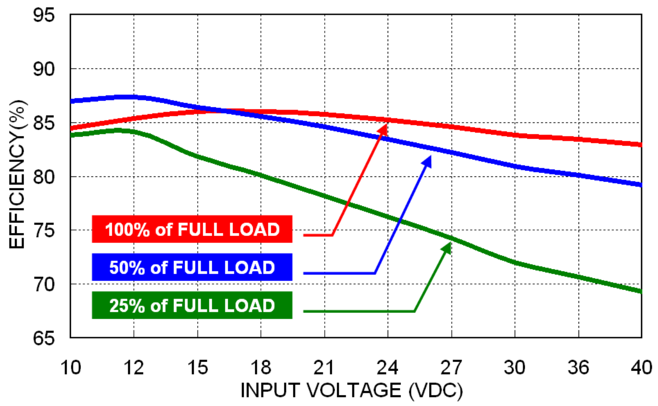
All test conditions are at 25℃.The figures are for DPX30-24WS3P3



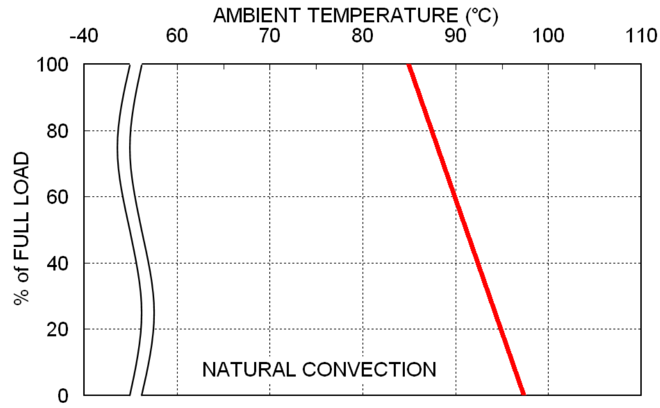
Efficiency versus Output Load



Power Dissipation versus Output Load



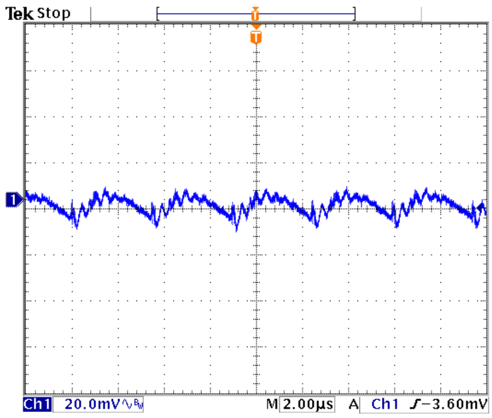
Efficiency versus Input Voltage



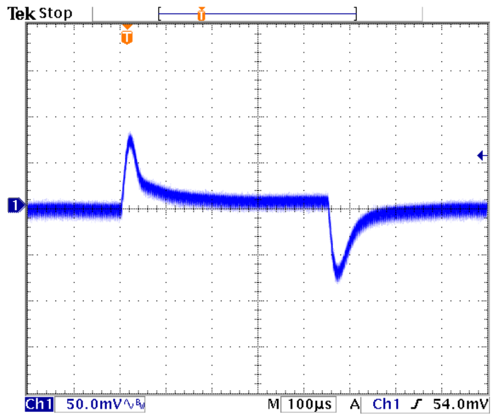
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

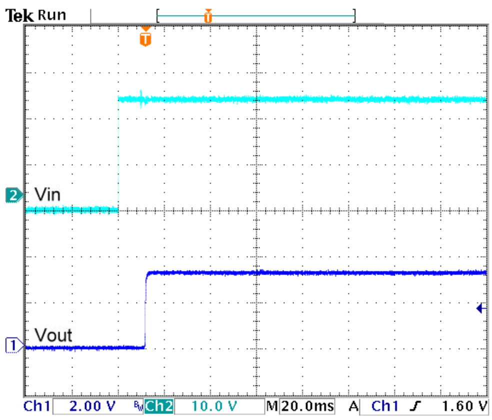
All test conditions are at 25℃.The figures are for DPX30-24WS3P3



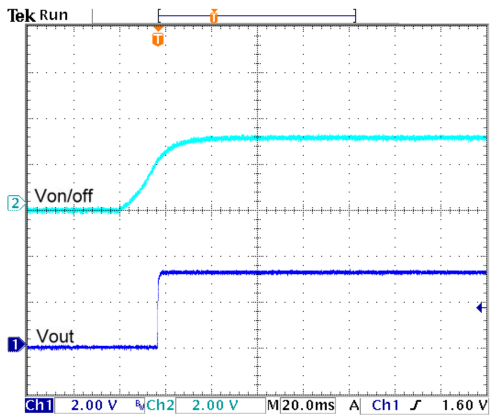
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



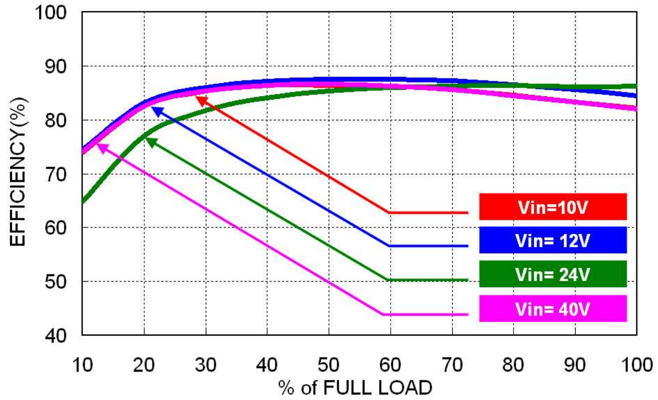
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



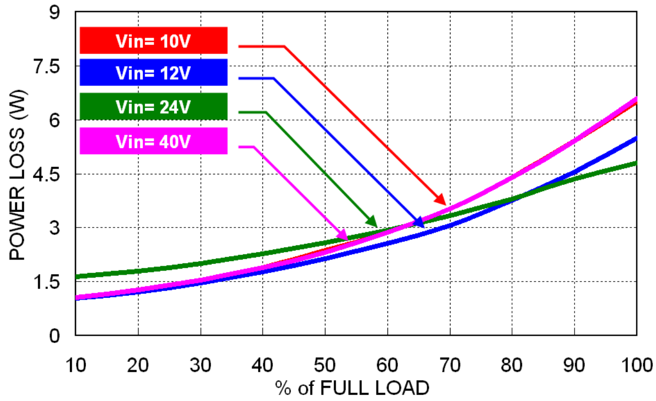
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

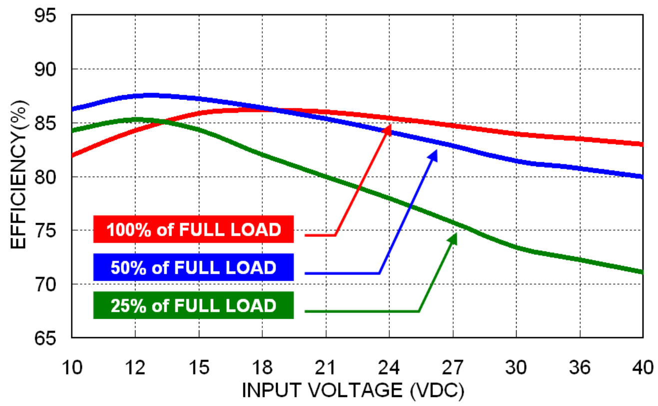
All test conditions are at 25℃.The figures are for DPX30-24WS05



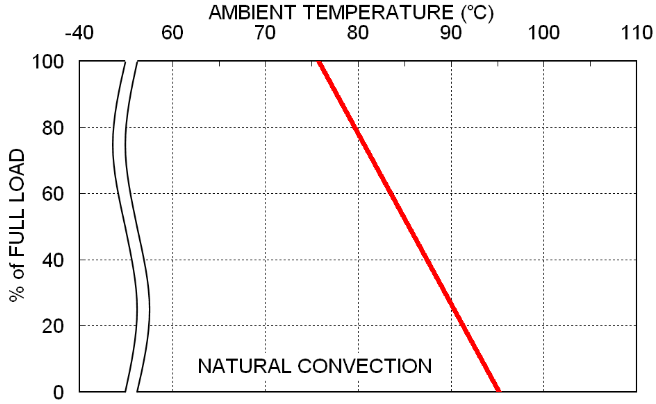
Efficiency versus Output Load



Power Dissipation versus Output Load



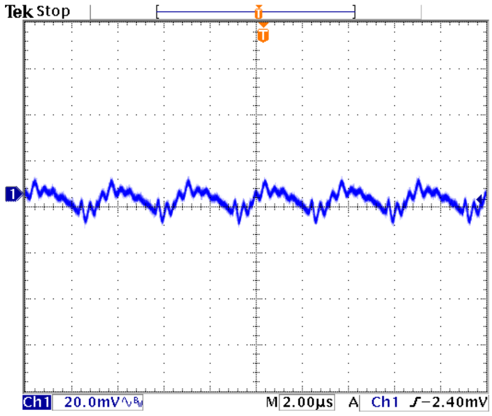
Efficiency versus Input Voltage



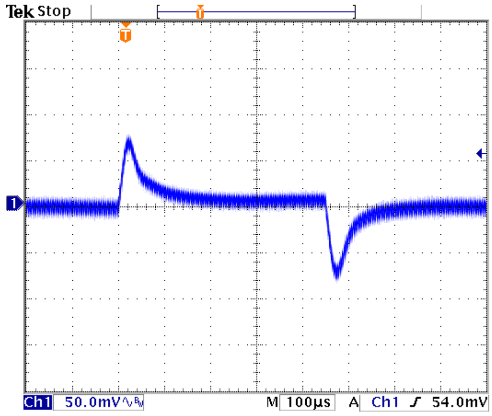
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

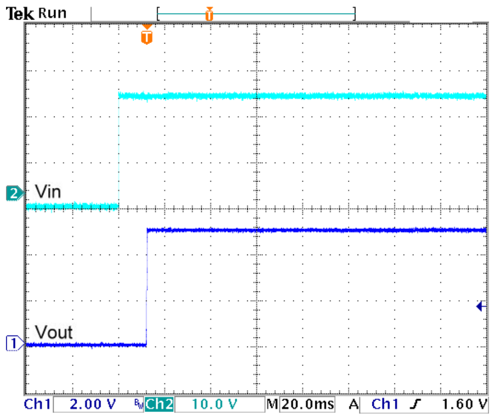
All test conditions are at 25℃.The figures are for DPX30-24WS05



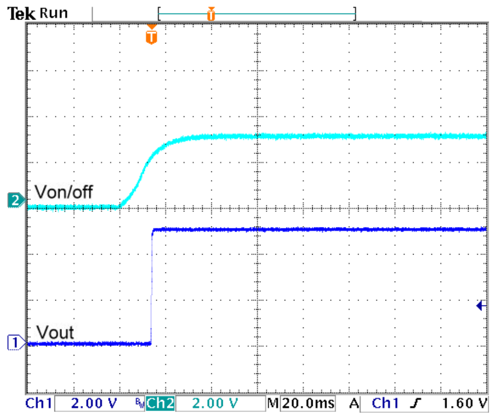
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



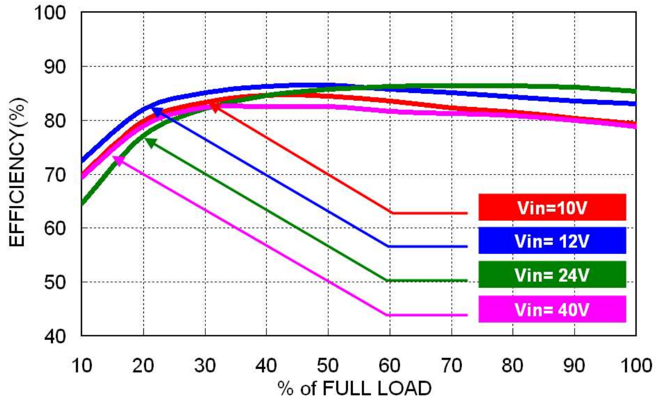
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



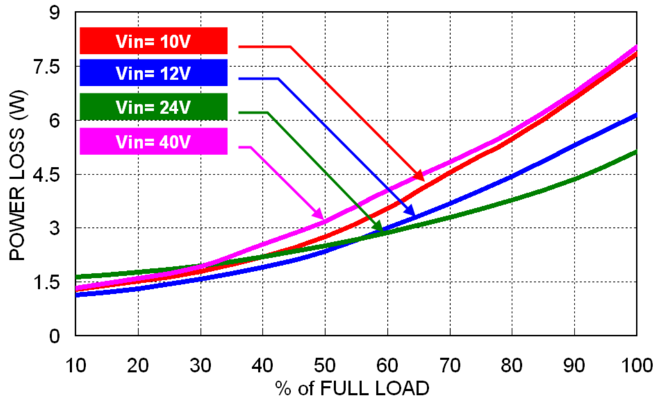
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

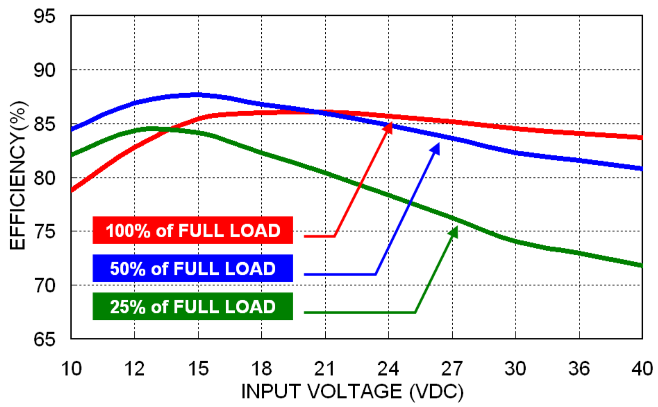
All test conditions are at 25℃.The figures are for DPX30-24WS12



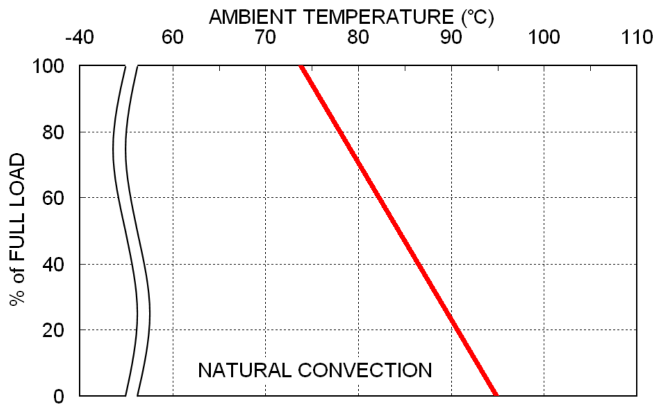
Efficiency versus Output Load



Power Dissipation versus Output Load



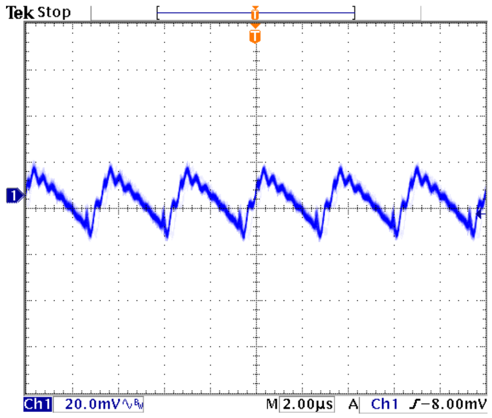
Efficiency versus Input Voltage



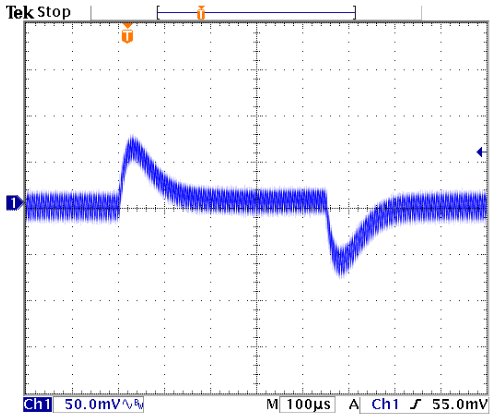
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

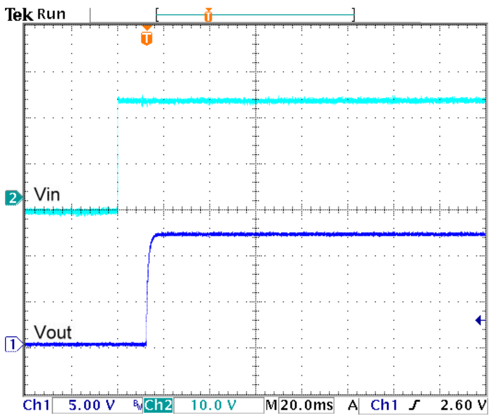
All test conditions are at 25℃.The figures are for DPX30-24WS12



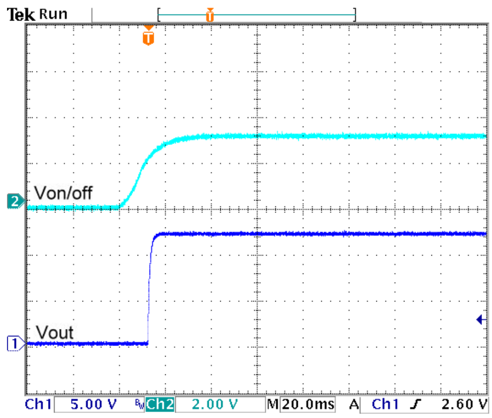
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



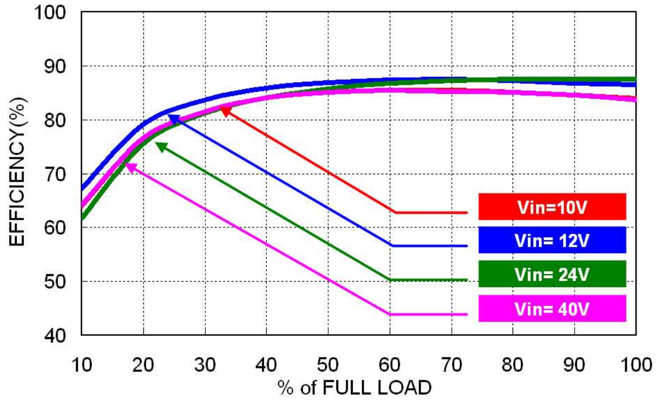
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



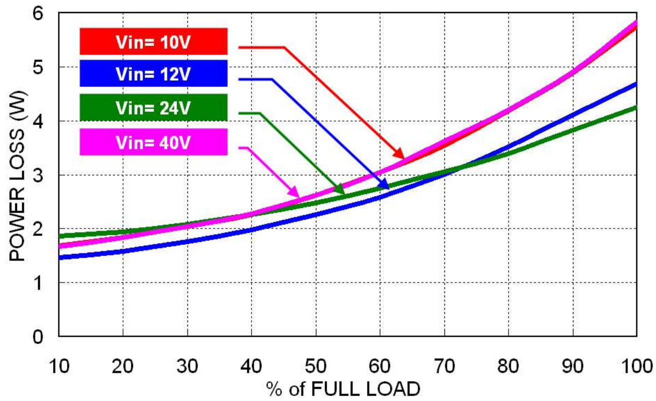
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

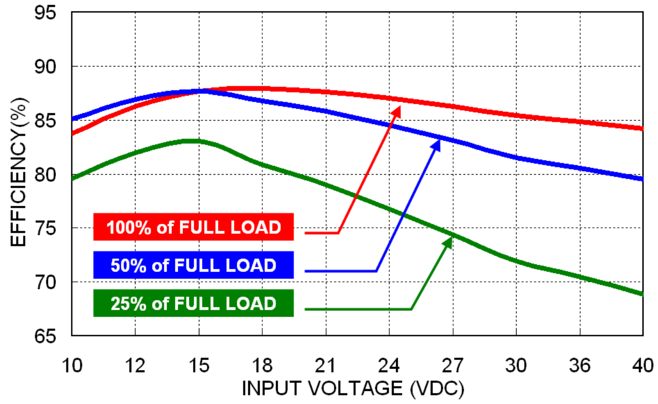
All test conditions are at 25℃.The figures are for DPX30-24WS15



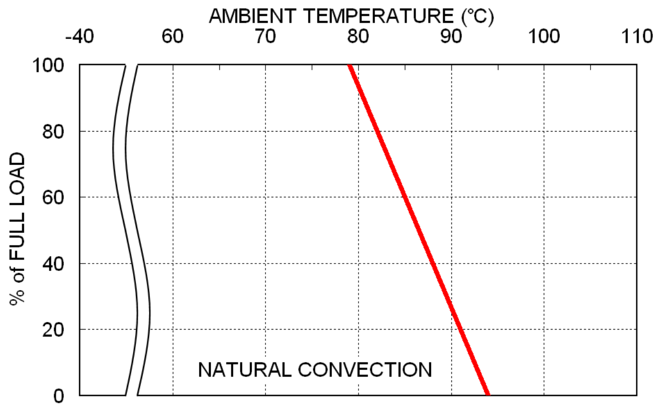
Efficiency versus Output Load



Power Dissipation versus Output Load



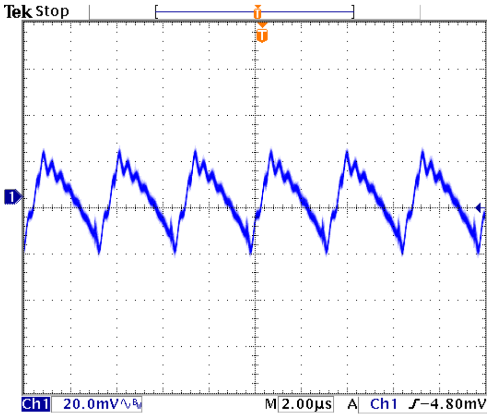
Efficiency versus Input Voltage



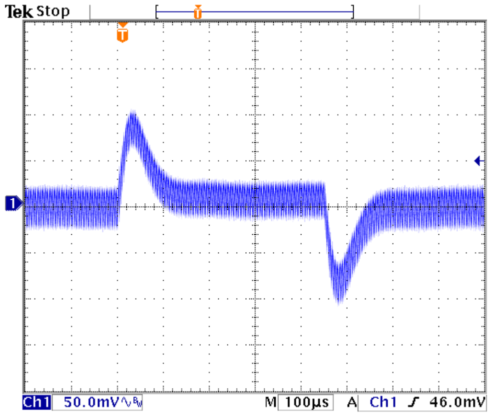
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

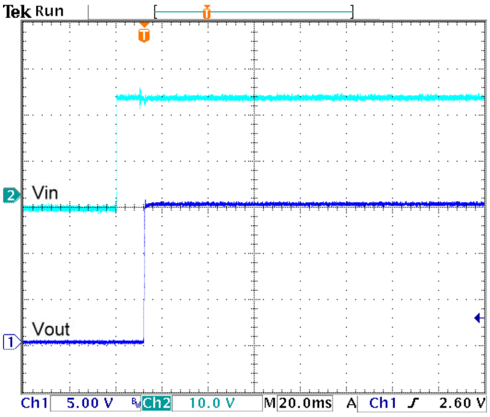
All test conditions are at 25℃.The figures are for DPX30-24WS15



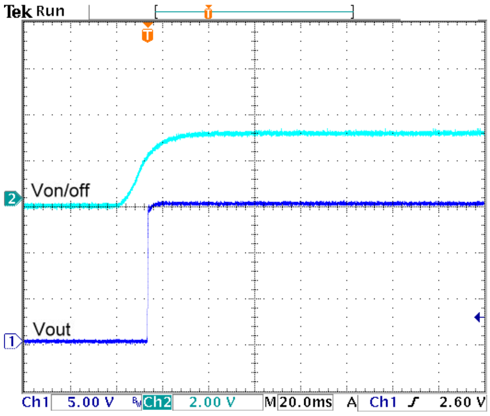
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



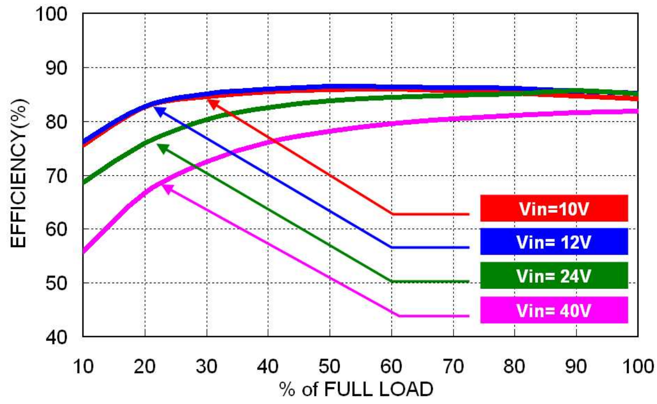
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



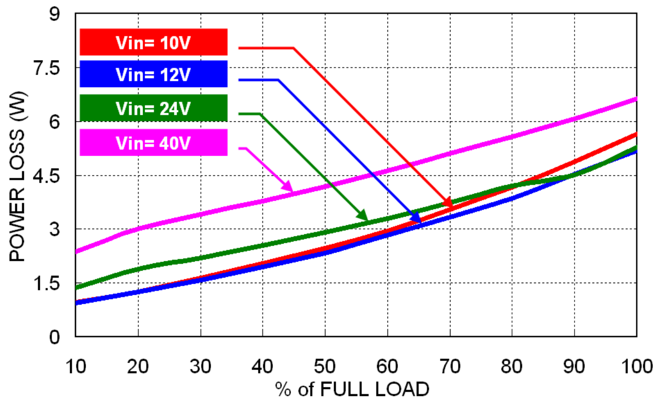
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

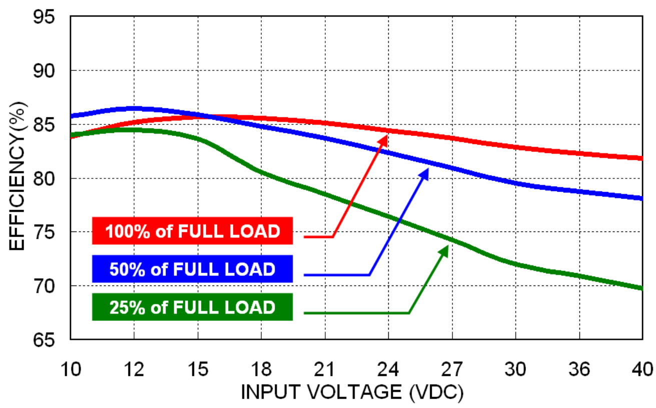
All test conditions are at 25℃.The figures are for DPX30-24WS24



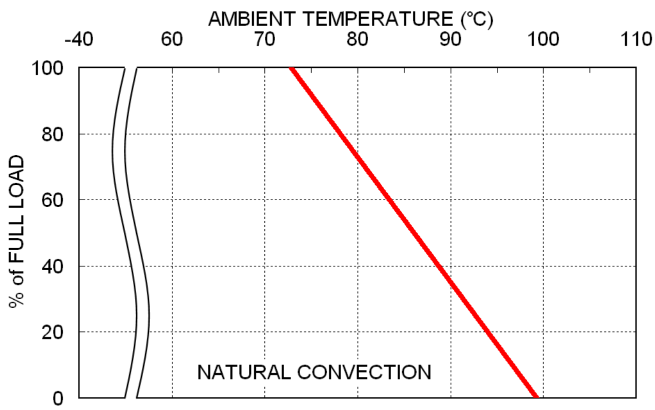
Efficiency versus Output Load



Power Dissipation versus Output Load



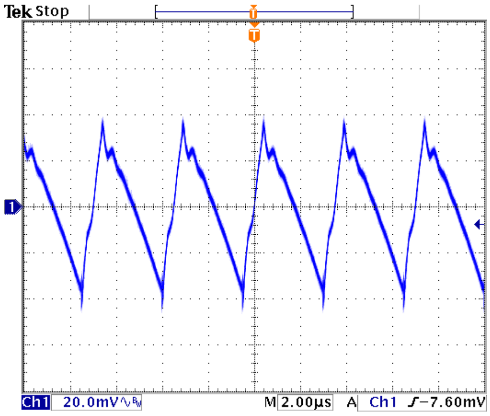
Efficiency versus Input Voltage



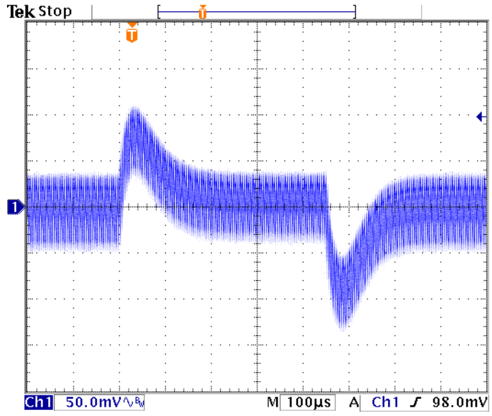
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

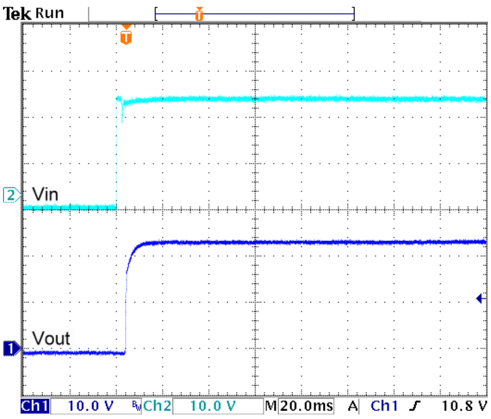
All test conditions are at 25℃.The figures are for DPX30-24WS24



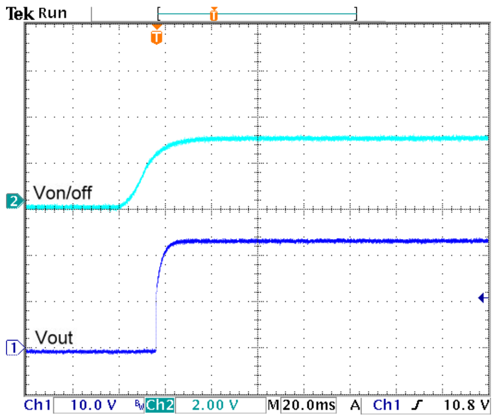
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



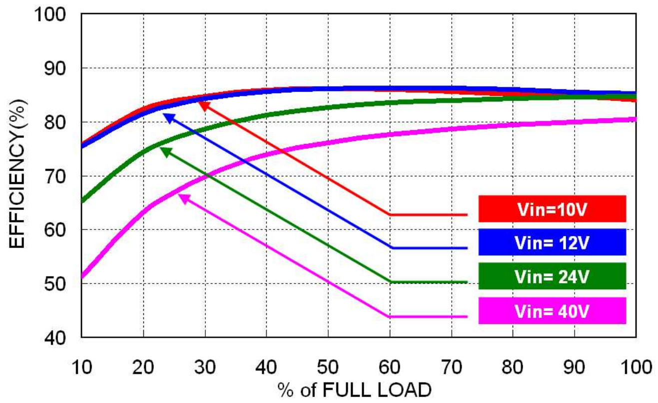
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



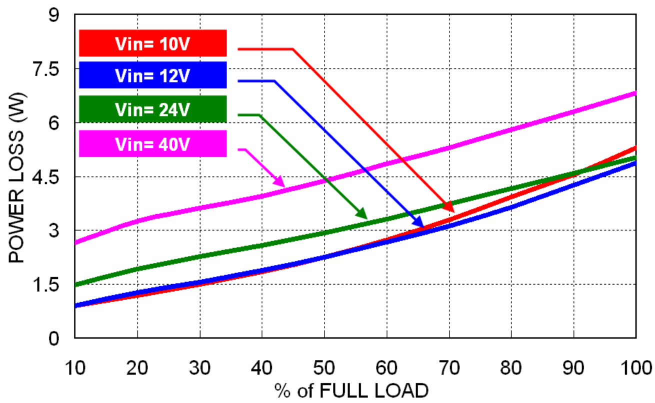
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

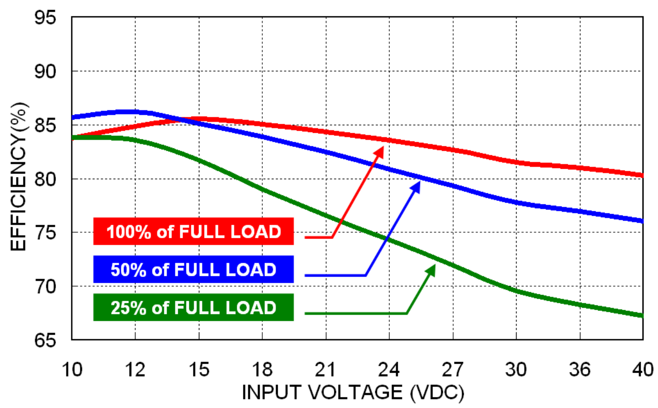
All test conditions are at 25℃.The figures are for DPX30-24WS28



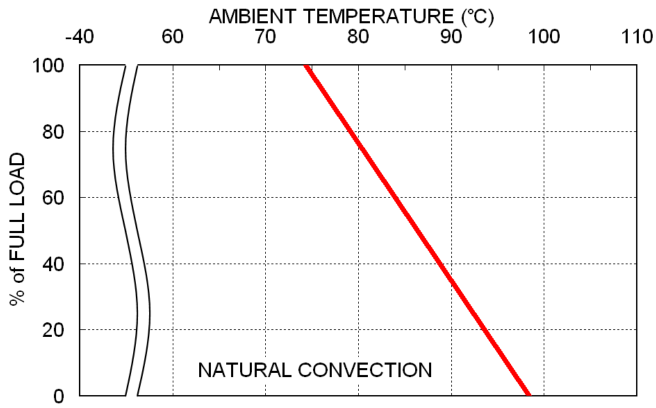
Efficiency versus Output Load



Power Dissipation versus Output Load



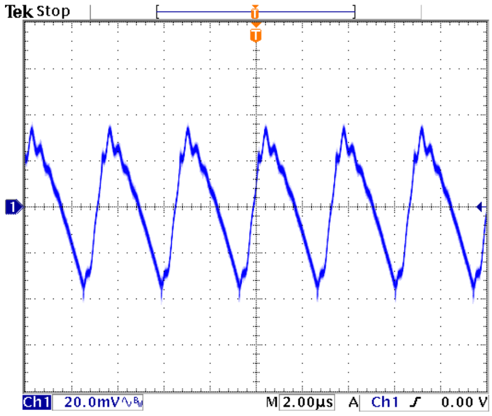
Efficiency versus Input Voltage



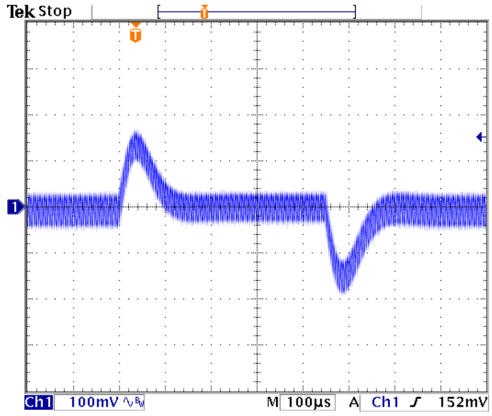
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

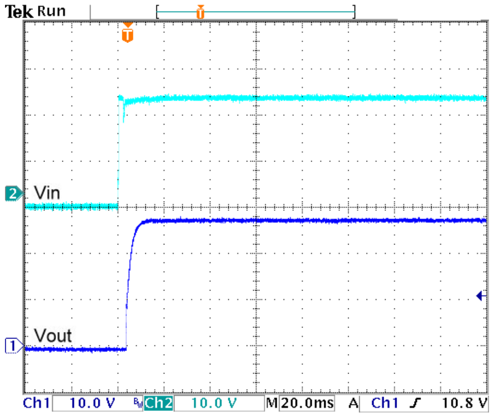
All test conditions are at 25℃.The figures are for DPX30-24WS28



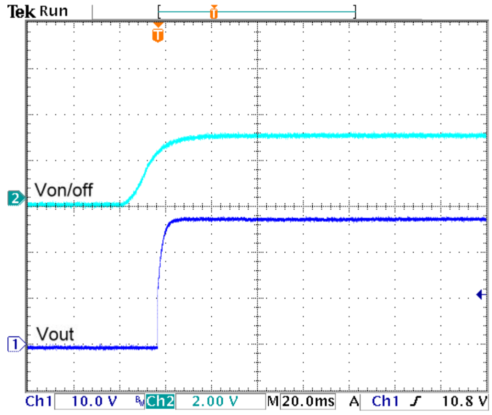
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



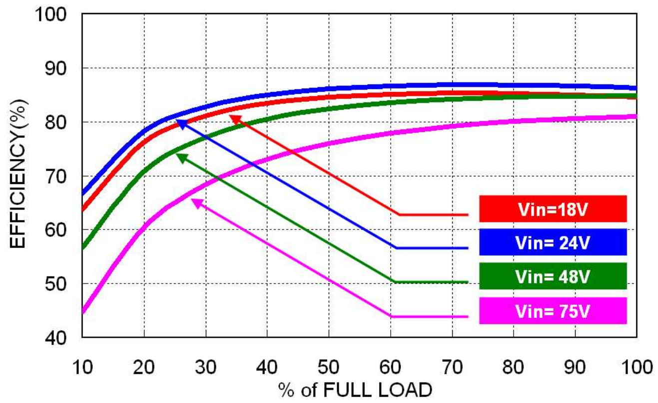
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



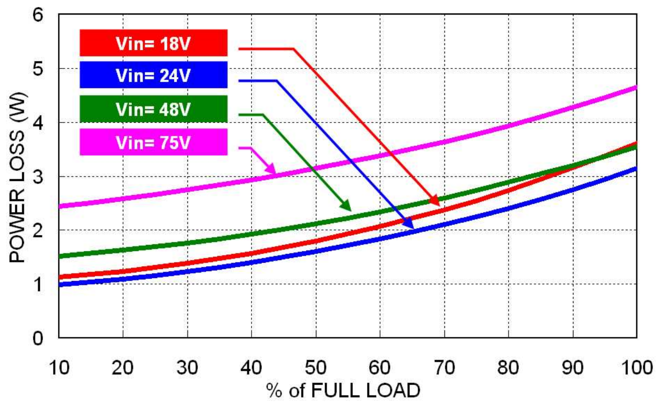
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

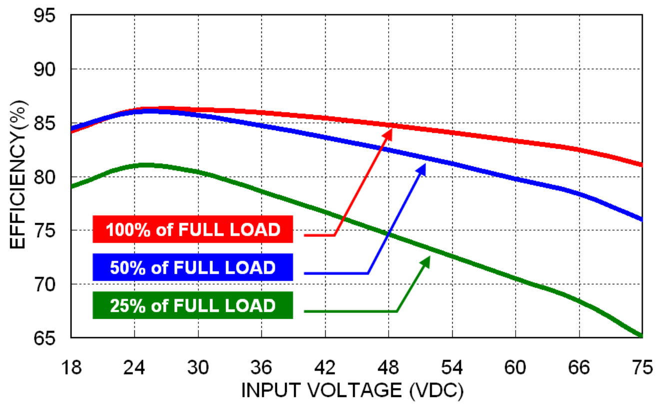
All test conditions are at 25℃.The figures are for DPX30-48WS3P3



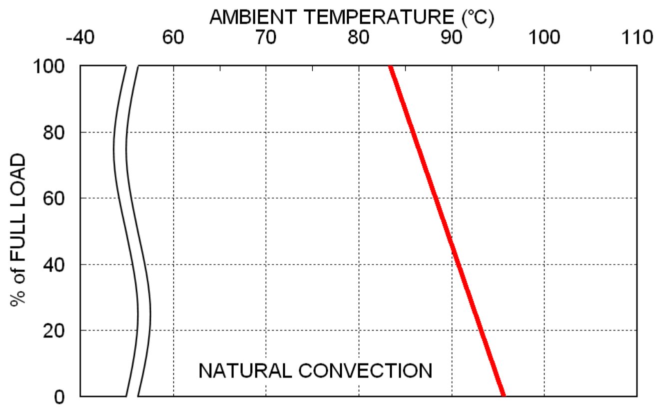
Efficiency versus Output Load



Power Dissipation versus Output Load



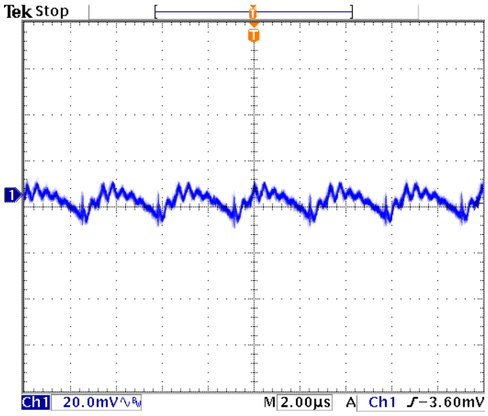
Efficiency versus Input Voltage



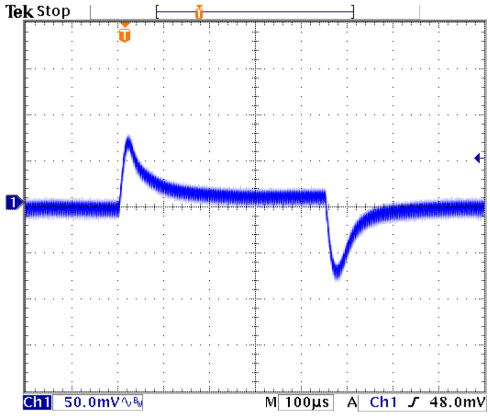
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

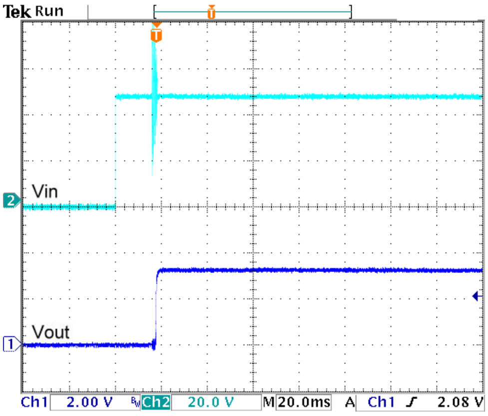
All test conditions are at 25℃.The figures are for DPX30-48WS3P3



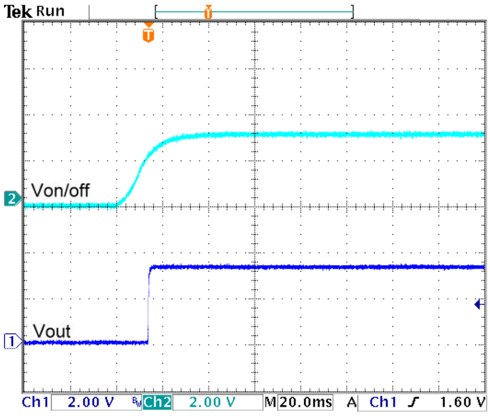
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



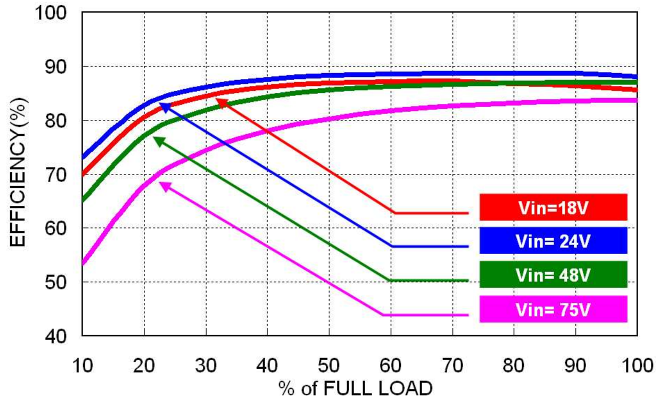
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



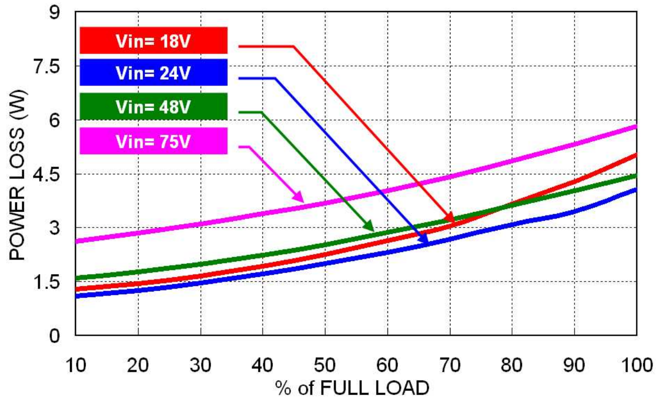
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

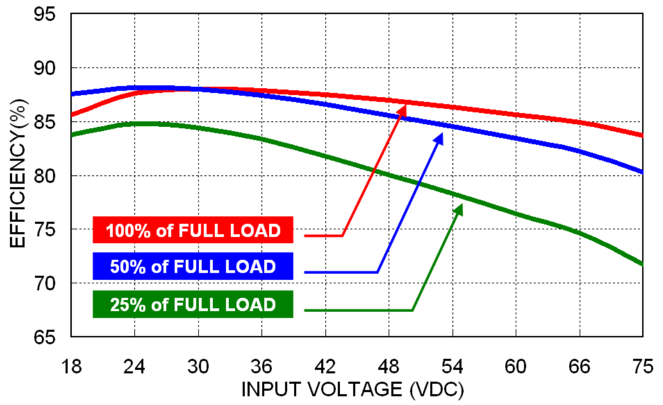
All test conditions are at 25℃.The figures are for DPX30-48WS05



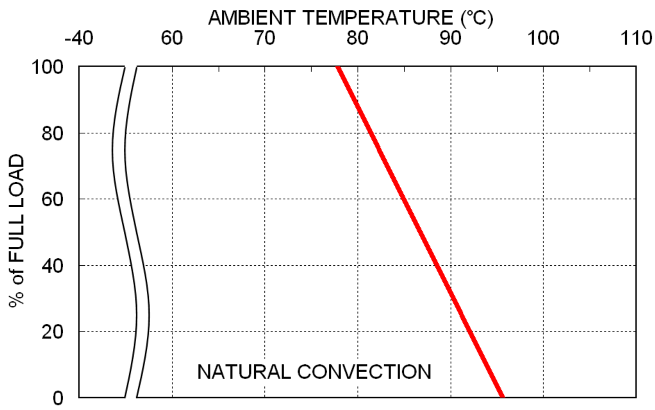
Efficiency versus Output Load



Power Dissipation versus Output Load



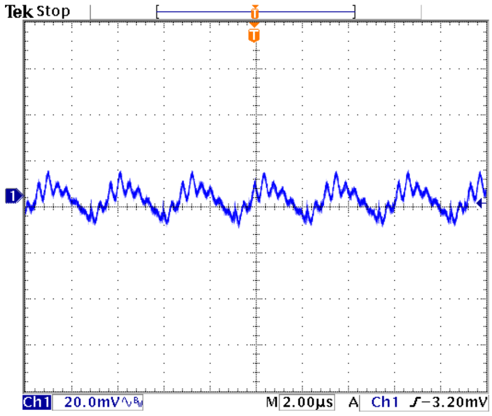
Efficiency versus Input Voltage



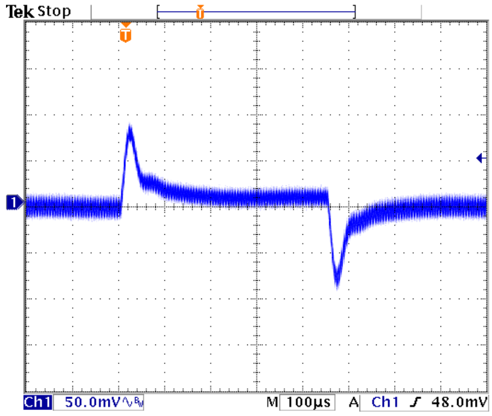
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

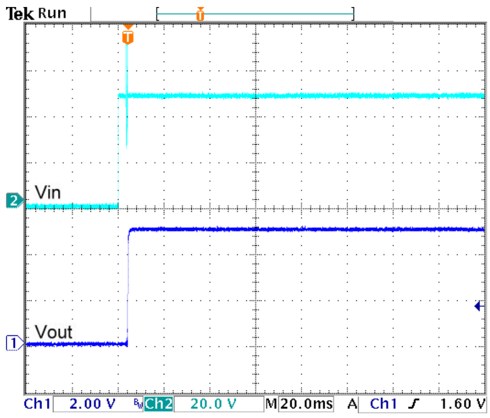
All test conditions are at 25℃.The figures are for DPX30-48WS05



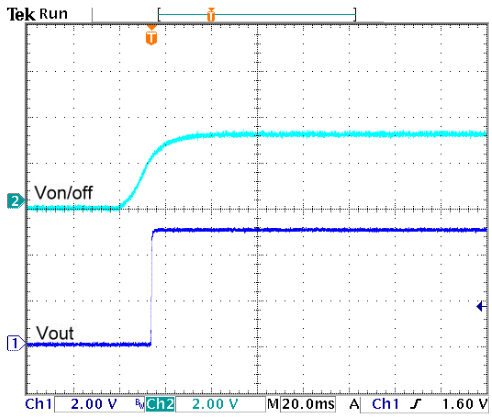
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



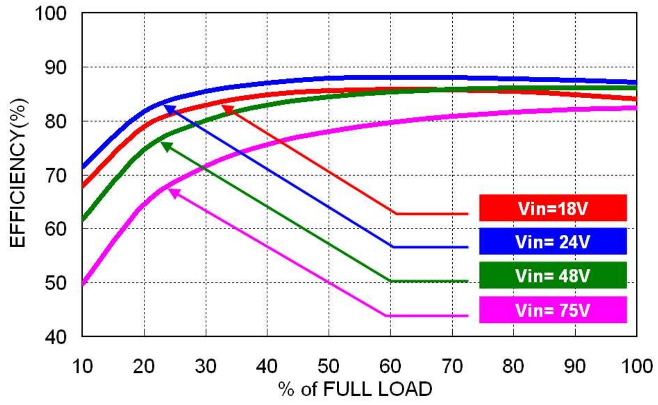
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



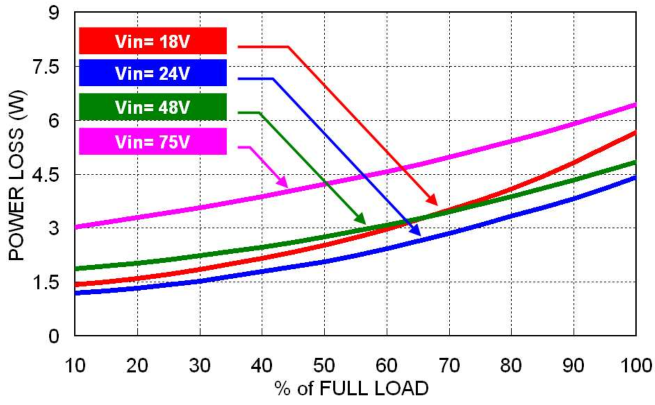
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

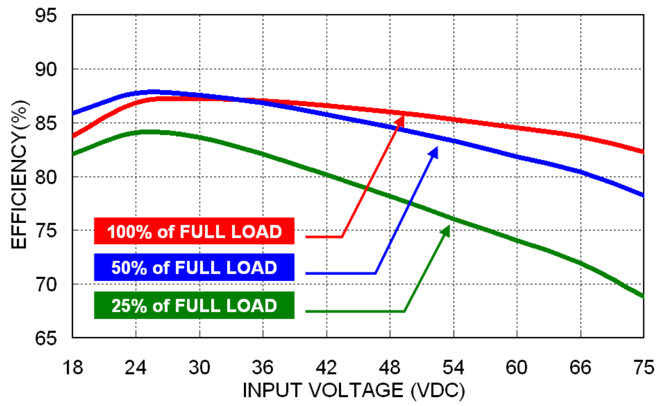
All test conditions are at 25℃.The figures are for DPX30-48WS12



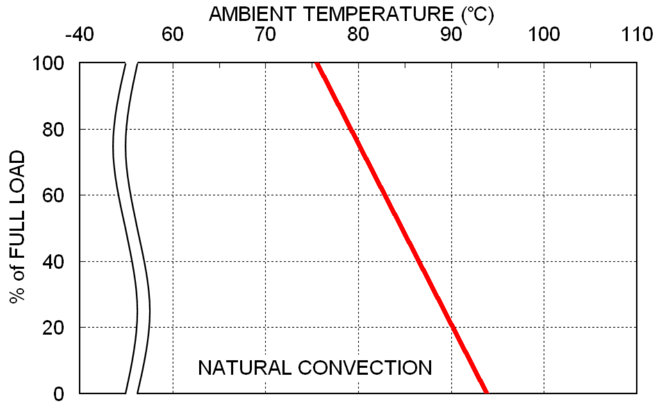
Efficiency versus Output Load



Power Dissipation versus Output Load



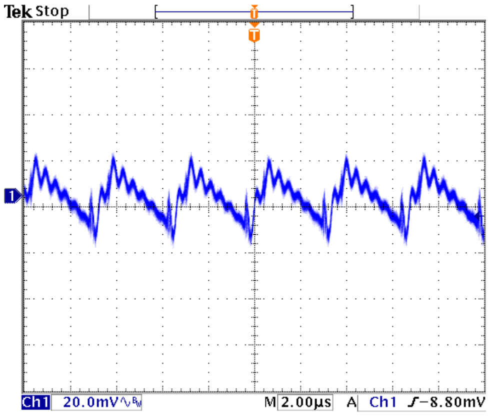
Efficiency versus Input Voltage



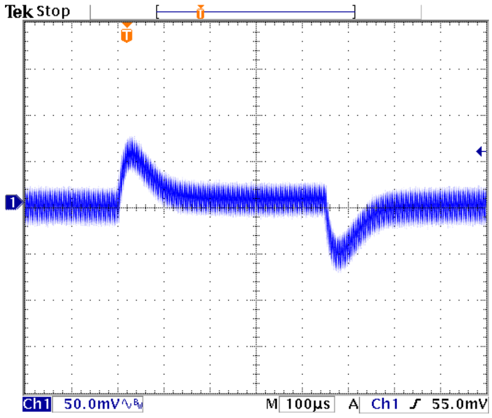
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

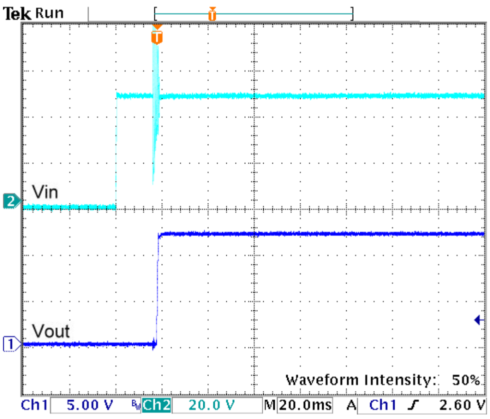
All test conditions are at 25℃.The figures are for DPX30-48WS12



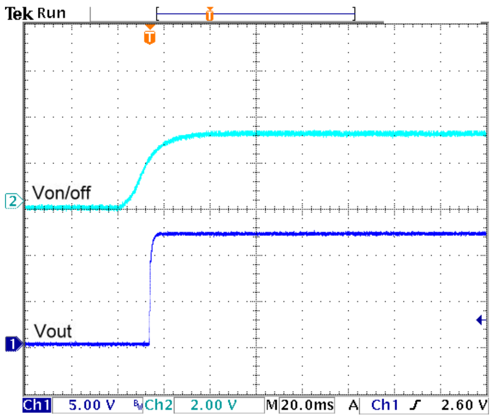
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



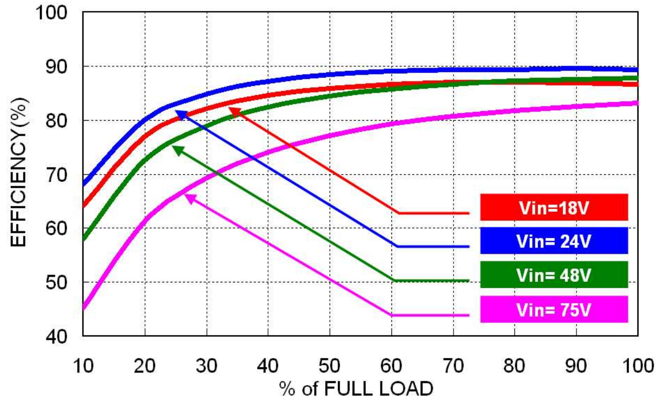
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



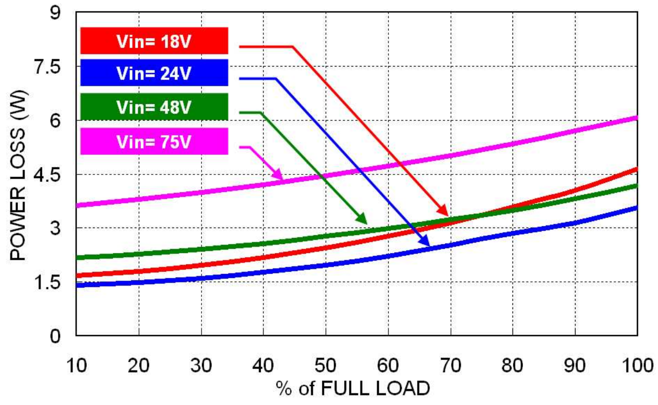
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

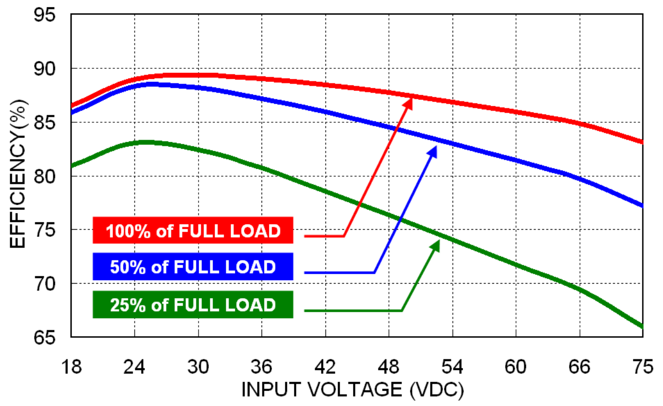
All test conditions are at 25℃.The figures are for DPX30-48WS15



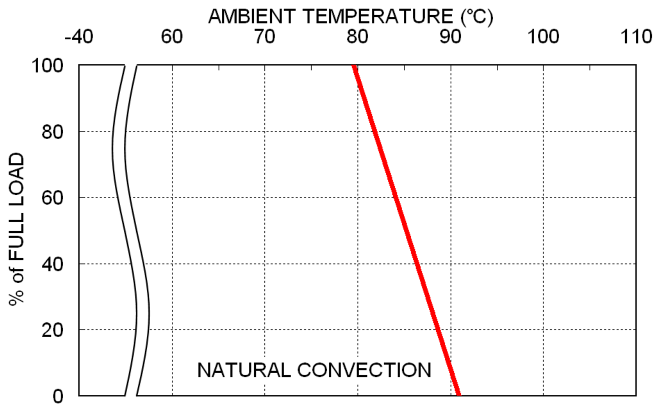
Efficiency versus Output Load



Power Dissipation versus Output Load



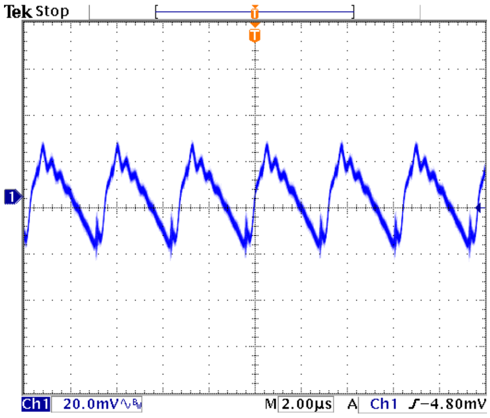
Efficiency versus Input Voltage



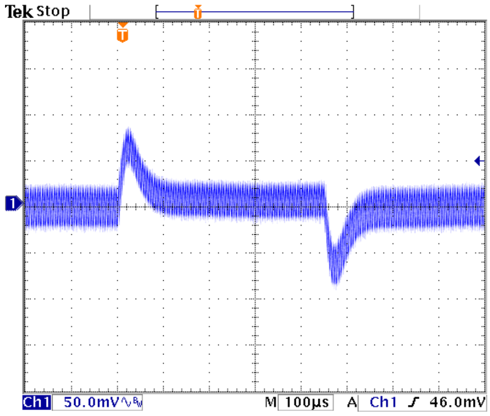
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

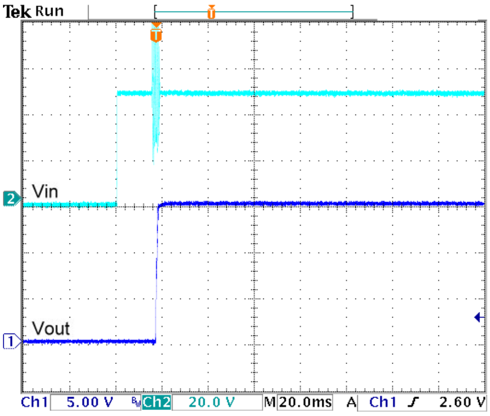
All test conditions are at 25℃.The figures are for DPX30-48WS15



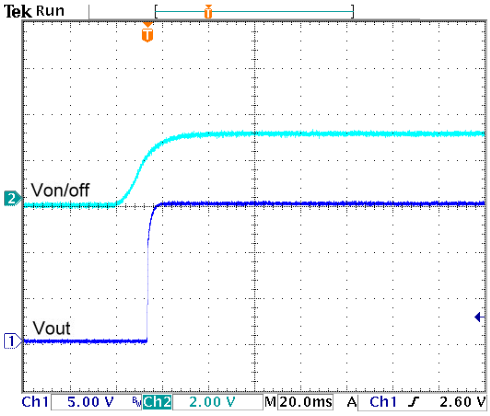
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from 100% to 75% to 100% of Full Load; Vin(nom)



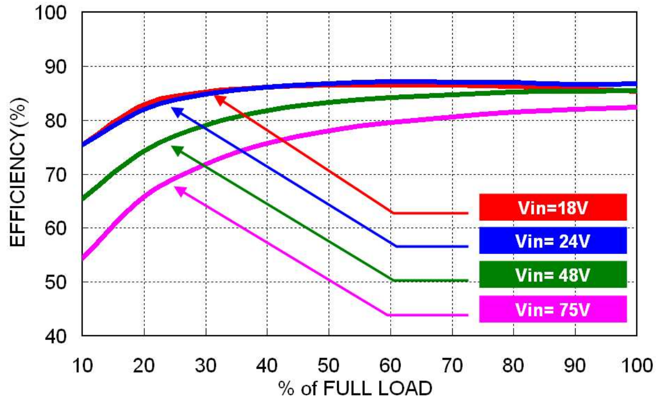
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



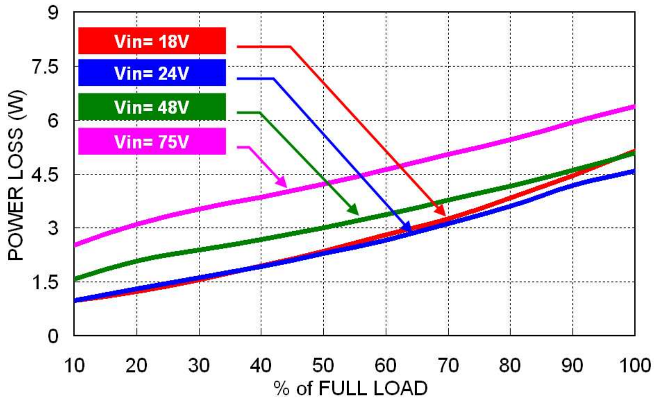
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

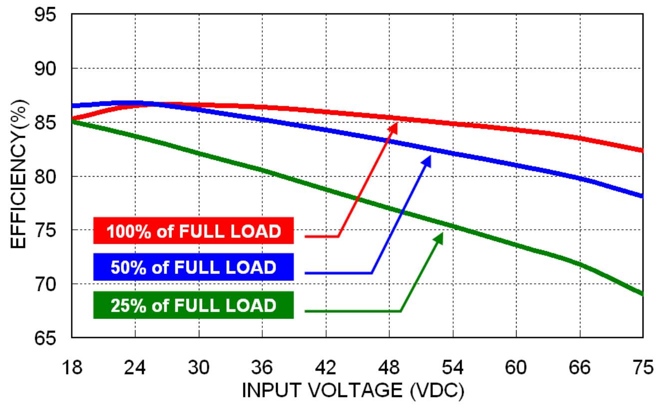
All test conditions are at 25℃.The figures are for DPX30-48WS24



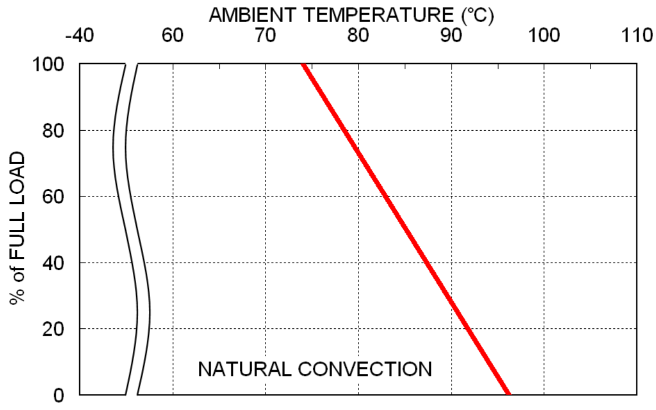
Efficiency versus Output Load



Power Dissipation versus Output Load



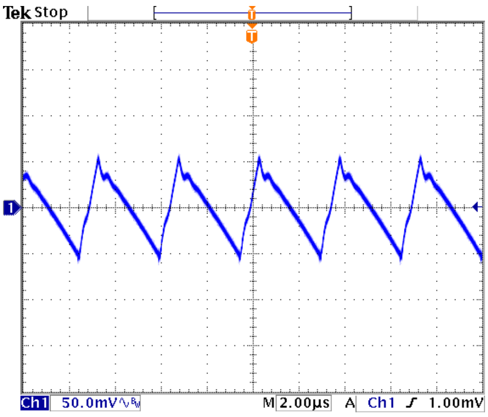
Efficiency versus Input Voltage



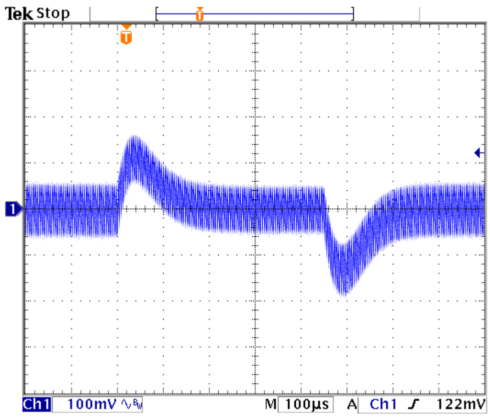
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

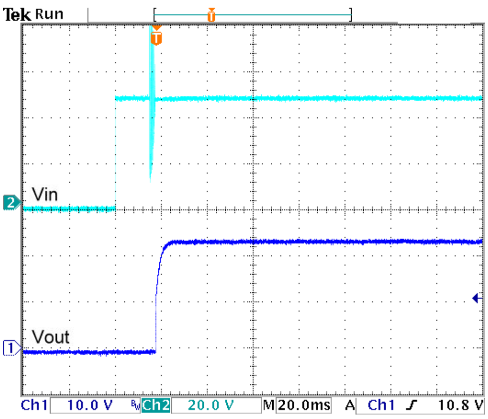
All test conditions are at 25℃.The figures are for DPX30-48WS24



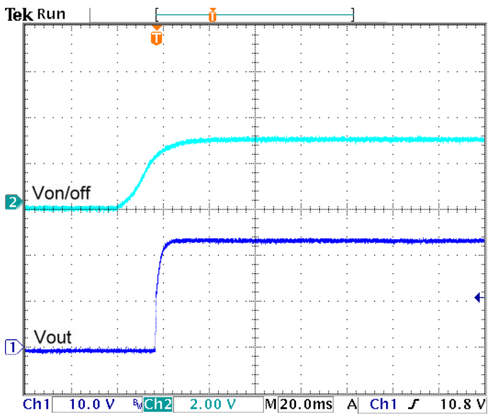
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



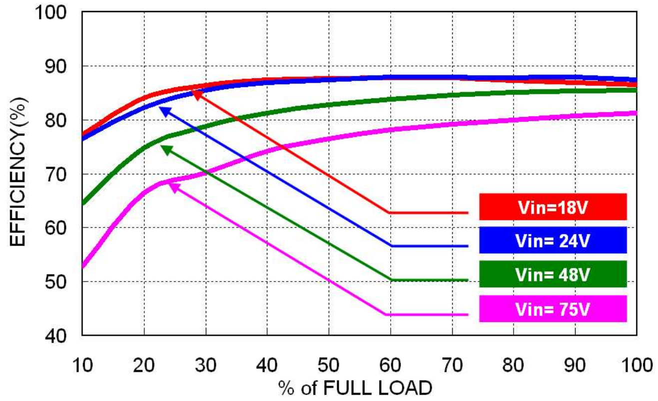
Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load



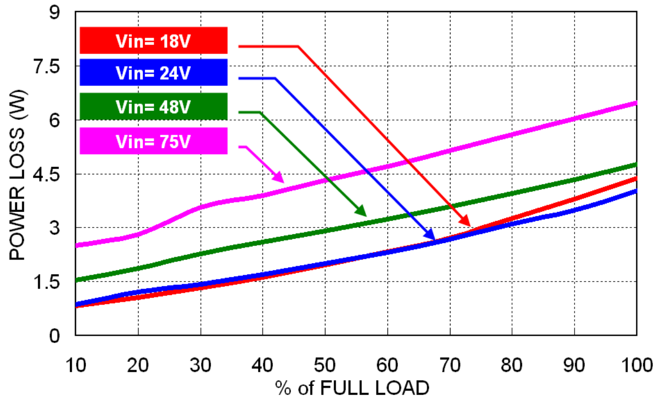
Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Characteristic Curves (Continued)

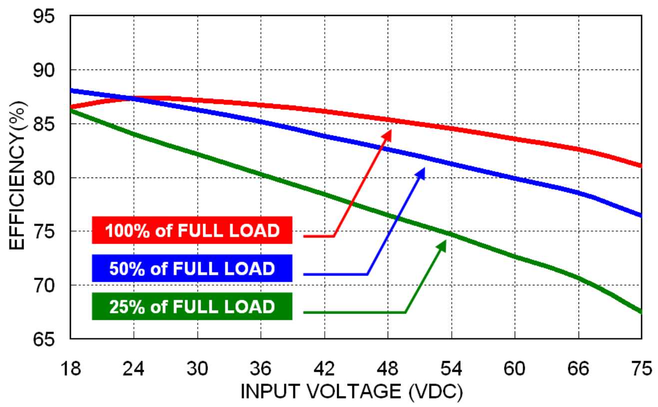
All test conditions are at 25℃.The figures are for DPX30-48WS28



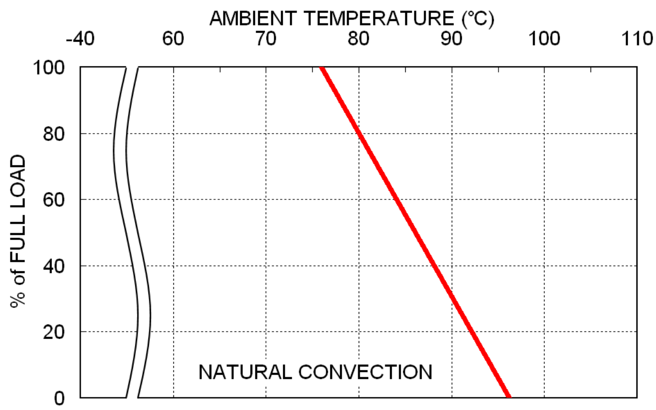
Efficiency versus Output Load



Power Dissipation versus Output Load



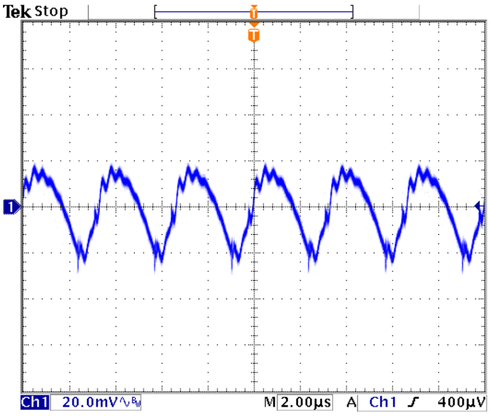
Efficiency versus Input Voltage



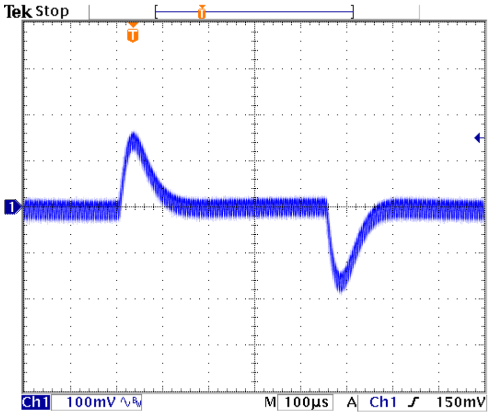
Derating Output Current versus Ambient Temperature and Airflow
Vin(nom)

Characteristic Curves (Continued)

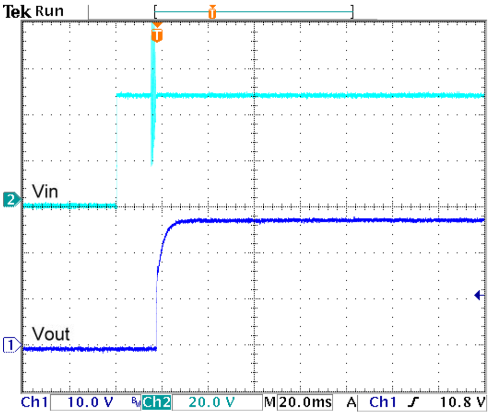
All test conditions are at 25℃.The figures are for DPX30-48WS28



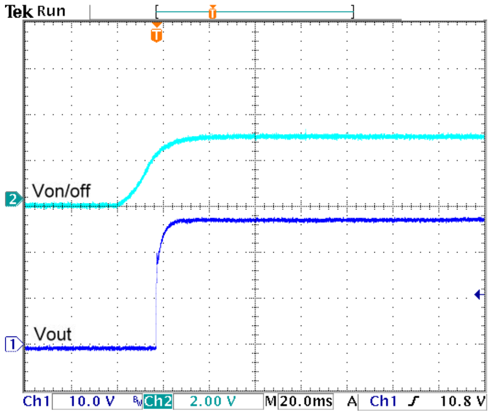
Typical Output Ripple and Noise.
Vin(nom); Full Load



Transient Response to Dynamic Load Change from
100% to 75% to 100% of Full Load; Vin(nom)



Typical Input Start-Up and Output Rise Characteristic
Vin(nom); Full Load

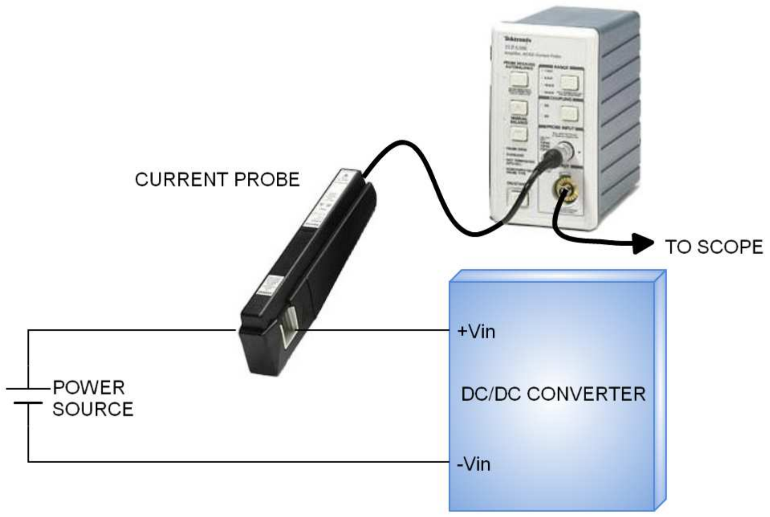


Using ON/OFF Voltage Start-Up and Output Rise Characteristic
Vin(nom); Full Load

Input Source Impedance

The power module should be connected to a low impedance input source. Highly inductive source impedance can affect the stability of the power module. The input reflected-ripple current measurement configuration is shown below:

Input reflected-ripple current measurement setup



Output Over Current Protection

When excessive output currents occur in the system, circuit protection is required on all power supplies. Normally, overload current is maintained at approximately 150 percent of rated current for DPX30-xxWSxx series.
Hiccup-mode is a method of operation in a power supply whose purpose is to protect the power supply from being damaged during an over-current fault condition. It also enables the power supply to restart when the fault is removed. There are other ways of protecting the power supply when it is over-loaded, such as the maximum current limiting or current fold-back methods.

One of the problems resulting from over current is that excessive heat may be generated in power devices; especially MOSFET and Schottky diodes and the temperature of those devices may exceed their specified limits. A protection mechanism has to be used to prevent those power devices from being damaged.

The operation of hiccup is as follows. When the current sense circuit sees an over-current event, the controller shuts off the power supply for a given time and then tries to start up the power supply again. If the over-load condition has been removed, the power supply will start up and operate normally; otherwise, the controller will see another over-current event and shut off the power supply again, repeating the previous cycle. Hiccup operation has none of the drawbacks of the other two protection methods, although its circuit is more complicated because it requires a timing circuit. The excess heat due to overload lasts for only a short duration in the hiccup cycle, hence the junction temperature of the power devices is much lower.

The hiccup operation can be done in various ways. For example, one can start hiccup operation any time an over-current event is detected; or prohibit hiccup during a designated start-up is usually larger than during normal operation and it is easier for an over-current event is detected; or prohibit hiccup during a designated start-up interval (usually a few milliseconds). The reason for the latter operation is that during start-up, the power supply needs to provide extra current to charge up the output capacitor. Thus the current demand during start-up is usually larger than during normal operation and it is easier for an over-current event to occur. If the power supply starts to hiccup once there is an over-current, it might never start up successfully. Hiccup mode protection will give the best protection for a power supply against over current situations, since it will limit the average current to the load at a low level, so reducing power dissipation and case temperature in the power devices.

Output Short Circuit Protection

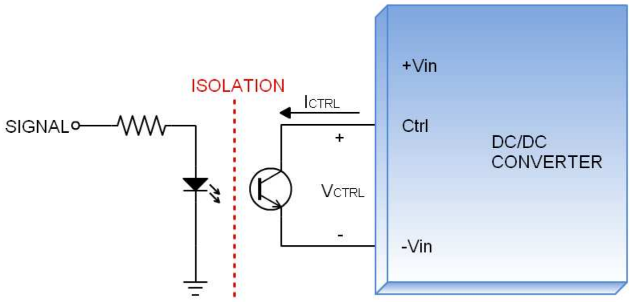
Continuous and auto-recovery mode.
During short circuit, converter still shut down. The average current during this condition will be very low and the device can be safety in this condition.

Output Over Voltage Protection

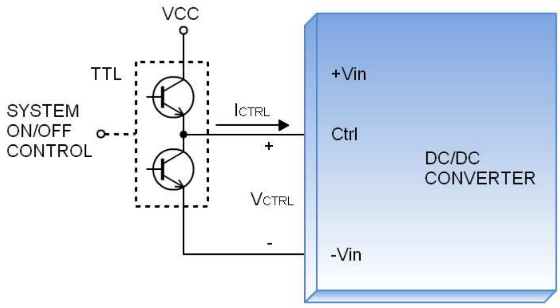
The output over-voltage protection consists of output Zener diode that monitors the voltage on the output terminals. If the voltage on the output terminals exceeds the over-voltage protection threshold, then the Zener diode clamps the output voltage.

Remote On/off Control

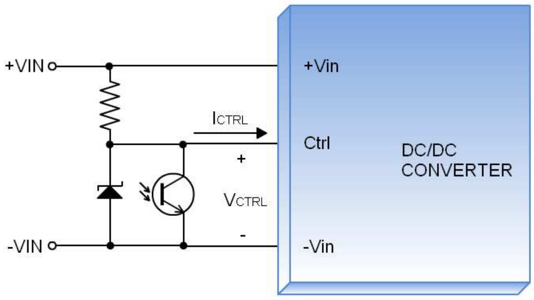
The Ctrl Pin is used to turn the power module on and off. The user must use a switch to control the logic voltage (high or low) level of the pin referenced to -Vin. The switch can be an open collector transistor, FET, or Photo-Coupler. The switch must be capable of sinking up to 1 mA at low-level logic voltage. A High-level logic of the Ctrl pin signal should be limited to a maximum voltage of 12V and a maximum current of 0.5 mA.



Isolated-Closure Remote ON/OFF



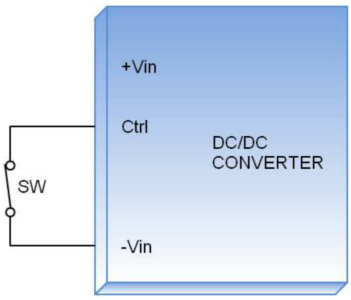
Level Control Using TTL Output



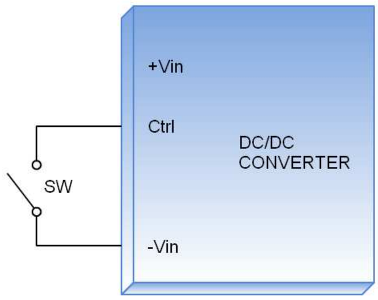
Level Control Using Line Voltage

There are two remote control options available, positive logic and negative logic.

a. The positive logic structure turns on the DC/DC module when the Ctrl pin is at a high- logic level and turns the module off by using a low-logic level.

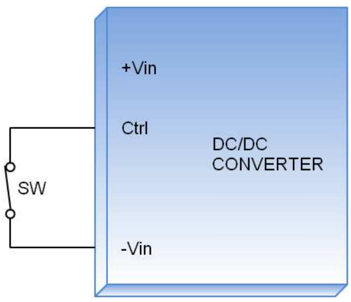


When DPX30-xxWSxx-P module is turned off using a Low-logic level

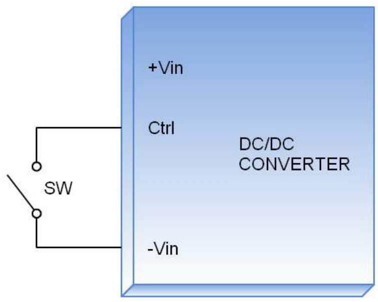


When DPX30-xxWSxx-P module is turned on using a High- logic level

b. The negative logic structure turns on the DC/DC module when the Ctrl pin is at a low- logic level and turns the module off using a high-logic level.



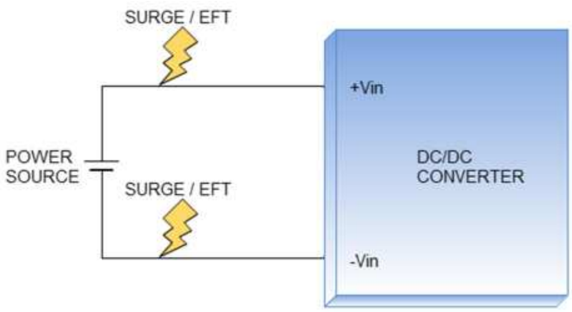
When DPX30-xxWSxx-N module is turned on using a Low-logic level



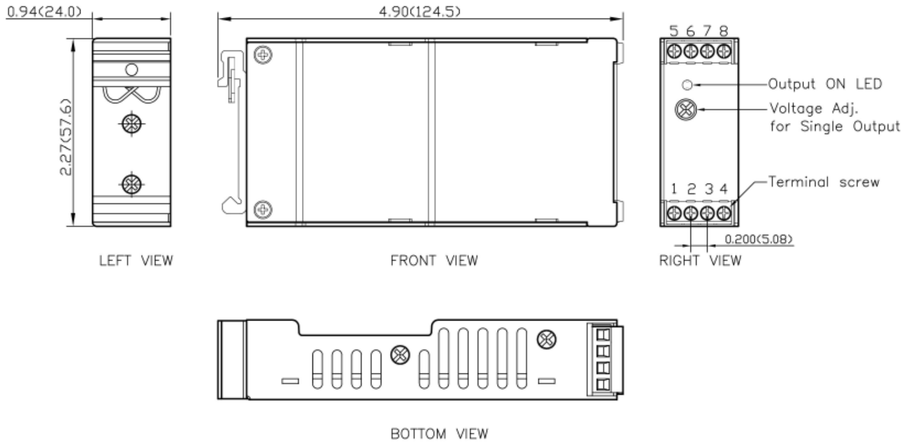
When DPX30-xxWSxx-N module is turned off using a High-logic level

EMS Considerations

The DPX30-xxWSxx series can meet Fast Transient EN61000-4-4 and Surge EN61000-4-5 performance criteria A. Please see the following schematic below.



Mechanical Data



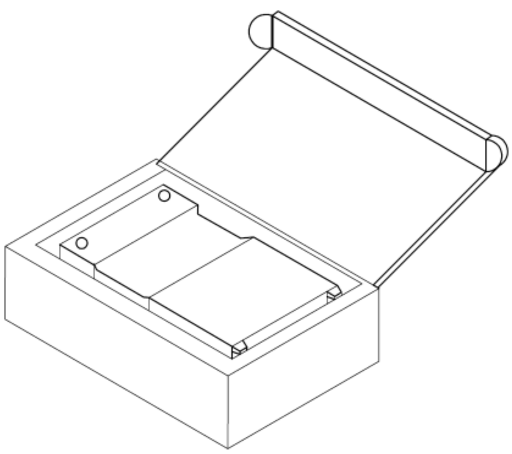
PIN CONNECTION

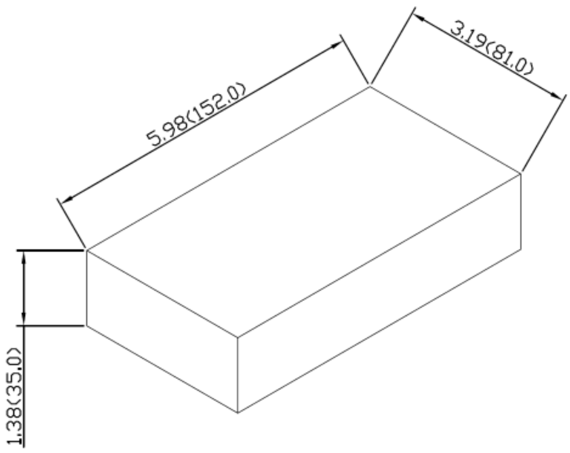
PIN	FUNCTION
1	Ctrl
2	-Vin
3	-Vin
4	+Vin
5	NC
6	-Vout
7	+Vout
8	NC

* NC : No Connection
* Screw terminals–wire range from 14 to 18 AWG

1. All dimensions in inch (mm)
2 Tolerance : X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
3. Terminal screw locked torque :
MAX 2.5kgf—cm (0.25N—m)

Packaging Information





1PCS / BOX
All dimensions in mm

Part Number Structure

DPX30	-	48W	S	05	-	N
Series Name		**Input Voltage (VDC)**	**Output**	**Output Voltage (VDC)**		**Remote Control Option**
		24: 10~40 **48:** 18~75	**S:** Single	**3P3:** 3.3 **05:** 5 **12:** 12 **15:** 15 **24:** 24 **28:** 28		**P:** Positive logic **N:** Negative logic

Model Number	Input Range VDC	Output Voltage VDC	Output Current @Full Load A	Input Current @ No Load mA	Efficiency %	Maximum Capacitor Load µF
DPX30-24WS3P3	10 ~ 40	3.3	6	52	85	19500
DPX30-24WS05	10 ~ 40	5	6	67	85	10200
DPX30-24WS12	10 ~ 40	12	2.5	69	85	3300
DPX30-24WS15	10 ~ 40	15	2	75	86	1100
DPX30-24WS24	10 ~ 40	24	1.25	39	82	500
DPX30-24WS28	10 ~ 40	28	1	45	83	340
DPX30-48WS3P3	18 ~ 75	3.3	6	32	85	19500
DPX30-48WS05	18 ~ 75	5	6	32	86	10200
DPX30-48WS12	18 ~ 75	12	2.5	38	85	3300
DPX30-48WS15	18 ~ 75	15	2	48	86	1100
DPX30-48WS24	18 ~ 75	24	1.25	30	83	500
DPX30-48WS28	18 ~ 75	28	1	30	84	340

MTBF and Reliability

The MTBF of DPX30-xxWxx DC/DC converters has been calculated using
MIL-HDBK-217F NOTICE2 FULL LOAD, Operating Temperature at 25℃. The resulting figure for MTBF is 8.412×10^5 hours.