HFE-LAN

RELIABILITY DATA

APPD	CHK	DWG
26/12/17	Arie G. 25/12/17	25/12/17

TDK-LAMBDA

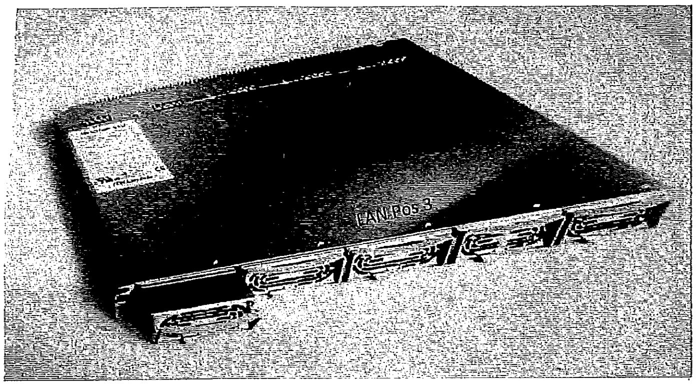
INDEX

The above data is typical value. As all units have nearly the same characteristics, the data to be considered as ability value.

THERMAL TEST

MODEL:HFE1600-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	

Supply Modules HFE1600-12 x 4



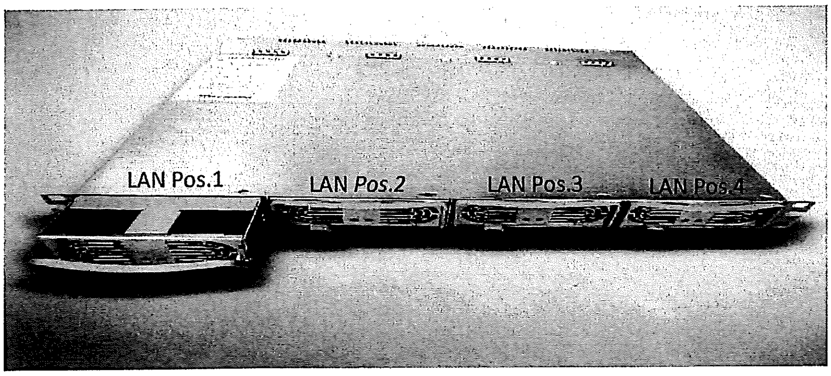
A = Ambient

Vin.(V)	NOTE	**Vin.230VAC**	**Vin.230VAC**	**Vin.100VAC**	**Vin.100VAC**
LAN Position		LAN Pos.3	LAN Pos.3	LAN Pos.3	LAN Pos.3
Vout.(V)		12.0	12.0	12.0	12.0
Io(A)		505.000	303.000	380.000	228.000
Tamb.(°C)		50.0	70.0	50.0	70.0
REF		50.4	70.0	50.1	70.0
SW102 (A)	SWITCH	72.2	84.7	71.2	83.4
PD101 (A)	LED	70.1	83.6	69.2	82.5
CN101	RJ-45 CONNECTOR	72.8	85.4	72.1	84.5
A102	PHY	81.4	93.4	80.8	92.2
A102 (A)	PHY	75.6	84.8	74.8	84.9
XT101	CRYSTAL	74.4	84.9	73.6	85.0
A101	MICROCONTROLLER	81.4	94.2	80.7	93.0
A101 (A)	MICROCONTROLLER	75.7	84.8	74.7	84.9
A104	REGULATOR	78.3	90.8	77.5	89.5
A104 (A)	REGULATOR	75.4	87.1	74.4	86.0
C146	E-CAPACITOR	74.5	86.3	73.6	85.0
A103 (A)	ESD PROTECTOR	79.4	88.9	77.2	87.1
A105	EEPROM	75	84.9	74.2	84.5
R137 (A)	RESISTOR (AREA)	75.7	88.2	74.9	86.9
CN103 (A)	POSITRO. CONNECTOR	79.2	88.7	77.1	86.9
R151 (A)	RESISTOR (AREA)	79	88.8	77.4	87.2

APPROVED:	CHECKED:	ENGR:	DRWG:
Arie G.	Arie G.		
04/12/17	04/12/17	30/11/17	30/11/17

THERMAL TEST

MODEL: HFE2500-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	



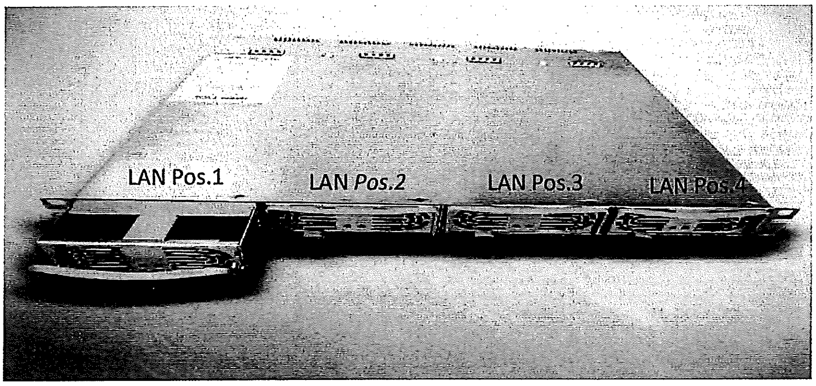
48V

Vin.(V)	NOTE	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC
LAN Position		LAN Pos.1	LAN Pos.1	LAN Pos.1	LAN Pos.1	LAN Pos.2	LAN Pos.2	LAN Pos.2	LAN Pos.2
Vout.(V)		48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
Io(A)		148.000	148.000	89.000	148.000	148.000	148.000	89.000	148.000
Tamb.(°C)		25.0	50.0	70.0	-10.0	25.0	50.0	70.0	-10.0
REF		25.0	50.2	69.7	-9.1	25.4	51.0	70.5	-10.5
A101	MICROCONTROLLER	43.7	68.9	84.8	8.6	50.2	74.3	87.4	15.5
A102	PHY	47.5	73.3	89.9	12.8	56.4	79.9	93.3	22.2
A103	ESD PROTECTOR	42.0	66.5	79.2	7.5	47.7	71.1	81.5	11.9
A104	REGULATOR	49.3	77.8	93.1	14.3	55.5	82.2	94.8	19.9
A105	EEPROM	38.4	63.6	79.4	3.5	45.0	69.1	81.9	10.1
XT101	CRYSTAL	37.0	62.4	78.4	1.6	44.3	68.5	81.3	9.2
CN103	CONNECTOR	46.3	69.7	81.0	11.4	49.4	73.2	82.5	12.9
CN101	RJ-45 CONNECTOR	31.2	57.4	74.9	-3.5	41.1	65.4	79.2	6.2
A103 amb.	ESD PROTECTOR	43.5	67.8	79.9	8.6	48.3	71.9	81.8	11.1
A105 amb.	EEPROM	37.5	62.8	77.9	1.6	45.0	69.2	80.8	9.1
Q101 amb.	MOSFET	36.0	62.2	78.4	0.1	45.3	69.2	81.7	10.3
PD101 amb.	LED	31.2	57.3	75.1	-3.5	42.6	66.9	80.3	7.5

Vin.(V)	NOTE	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC
LAN Position		LAN Pos.3	LAN Pos.3	LAN Pos.3	LAN Pos.3	LAN Pos.4	LAN Pos.4	LAN Pos.4	LAN Pos.4
Vout.(V)		48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
Io(A)		148.000	148.000	89.000	148.000	148.000	148.000	89.000	148.000
Tamb.(°C)		25.0	50.0	70.0	-10.0	25.0	50.0	70.0	-10.0
REF		25.2	50.1	70.0	-10.1	25.0	49.8	69.8	-10.0
A101	MICROCONTROLLER	49.7	74.6	86.9	13.9	46.1	70.8	84.3	10.8
A102	PHY	56.3	80.6	93.3	21.1	52.8	77.1	90.9	18.0
A103	ESD PROTECTOR	46.3	70.6	80.7	9.9	44.8	69.5	79.4	9.1
A104	REGULATOR	55.7	82.2	94.2	18.1	52.1	78.5	91.8	14.9
A105	EEPROM	44.6	69.5	81.5	8.8	41.1	65.9	79.1	5.8
XT101	CRYSTAL	43.9	68.9	81.0	8.0	40.5	65.3	78.5	5.1
CN103	CONNECTOR	45.3	71.6	81.1	8.5	46.2	71.9	80.5	10.1
CN101	RJ-45 CONNECTOR	41.0	66.0	79.1	5.3	37.2	62.2	76.5	1.9
A103 amb.	ESD PROTECTOR	45.5	70.8	80.8	9.1	44.6	69.7	79.4	8.7
A105 amb.	EEPROM	44.1	69.3	80.3	8.0	40.7	65.7	77.7	4.9
Q101 amb.	MOSFET	44.8	69.7	81.5	9.0	41.1	66.0	78.9	5.8
PD101 amb.	LED	42.5	67.4	80.2	7.1	38.6	63.5	77.7	3.5

DWG.No			
APPROV.	CHECK	ENGR.	DRAWN
Arie G.	Arie G.		
26/11/16	26/11/16	26/11/16	26/11/16

MODEL: HFE2500-LAN		
PROTOTYPE		PRN.
JUDGEMENT: OK / NG		



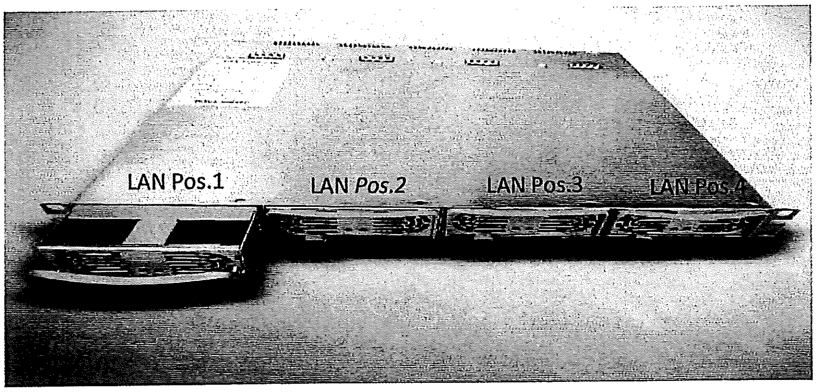
12V

Vin.(V)		Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC
LAN Position		LAN Pos.1	LAN Pos.1	LAN Pos.1	LAN Pos.1	LAN Pos.2	LAN Pos.2	LAN Pos.2	LAN Pos.2
Vout.(V)	**NOTE**	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Io(A)		570.000	570.000	342.000	570.000	570.000	570.000	342.000	570.000
Tamb.(°C)		25.0	50.0	70.0	-10.0	25.0	50.0	70.0	-10.0
REF		25.0	49.8	69.9	-10.2	24.9	49.5	69.9	-10.3
A101	MICROCONTROLLER	45.5	70.2	85.2	10.1	52.7	75.3	88.3	16.6
A102	PHY	49.3	75.0	90.8	13.8	58.7	81.0	94.3	23.2
A103	ESD PROTECTOR	47.1	71.0	80.8	11.0	52.1	74.6	83.6	15.3
A104	REGULATOR	52.9	79.2	93.6	16.1	60.1	83.3	95.9	21.5
A105	EEPROM	40.6	65.3	80.0	5.2	47.6	70.3	82.8	11.6
XT101	CRYSTAL	39.0	64.1	79.3	3.4	46.9	69.7	82.5	10.7
CN103	CONNECTOR	55.8	77.8	83.7	19.4	55.6	77.5	85.1	17.9
CN101	RJ-45 CONNECTOR	36.2	61.6	77.2	0.3	41.9	65.1	78.7	6.2
A103 amb.	ESD PROTECTOR	48.4	72.7	82.1	11.6	52.9	75.7	84.2	15.4
A105 amb.	EEPROM	40.6	66.3	79.3	4.5	48.5	71.5	82.3	11.9
Q101 amb.	MOSFET	38.9	65.1	79.6	2.7	48.4	71.0	83.1	12.3
PD101 amb.	LED	33.1	59.6	76.3	-2.8	44.8	68.1	81.2	9.0

Vin.(V)		Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC
LAN Position		LAN Pos.3	LAN Pos.3	LAN Pos.3	LAN Pos.3	LAN Pos.4	LAN Pos.4	LAN Pos.4	LAN Pos.4
Vout.(V)	**NOTE**	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Io(A)		570.000	570.000	342.000	570.000	570.000	570.000	342.000	570.000
Tamb.(°C)		25.0	50.0	70.0	-10.0	25.0	50.0	70.0	-10.0
REF		25.7	50.7	70.1	-9.6	25.2	50.2	70.1	-10.5
A101	MICROCONTROLLER	53.3	76.5	88.6	18.1	50.8	72.9	86.2	12.2
A102	PHY	59.3	82.2	94.6	24.7	57.0	78.8	92.4	18.9
A103	ESD PROTECTOR	52.4	75.3	83.9	16.9	52.5	74.7	82.9	13.4
A104	REGULATOR	60.7	84.5	96.1	22.8	57.4	80.8	93.7	16.7
A105	EEPROM	48.6	71.7	83.4	13.2	46.1	68.3	81.1	7.5
XT101	CRYSTAL	47.8	71.0	83.1	12.4	45.5	67.7	80.8	6.7
CN103	CONNECTOR	54.1	77.9	85.0	17.7	55.8	78.9	84.9	16.0
CN101	RJ-45 CONNECTOR	43.3	66.1	79.4	8.1	40.2	63.1	76.9	2.0
A103 amb.	ESD PROTECTOR	52.2	76.2	84.3	16.2	51.6	74.5	82.7	12.6
A105 amb.	EEPROM	49.6	72.8	82.9	13.5	46.8	69.7	80.7	7.8
Q101 amb.	MOSFET	49.4	72.5	83.8	13.8	46.3	68.9	81.3	7.8
PD101 amb.	LED	46.1	69.5	81.9	11.2	43.3	65.8	79.5	4.8

DWG.No			
APPROV.	CHECK	ENGR.	DRAWN
Arie G.	Arie G.		
26/11/16	26/11/16	26/11/16	26/11/16

MODEL: HFE2500-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	



24V

Vin.(V)	NOTE	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC
LAN Position		LAN Pos.1	LAN Pos.1	LAN Pos.1	LAN Pos.1	LAN Pos.2	LAN Pos.2	LAN Pos.2	LAN Pos.2
Vout.(V)		24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Io(A)		296.000	296.000	178.000	296.000	296.000	296.000	178.000	296.000
Tamb.(°C)		25.0	50.0	70.0	-10.0	25.0	50.0	70.0	-10.0
REF		25.0	49.9	69.7	-10.6	24.3	50.3	70.1	-9.4
A101	MICROCONTROLLER	44.9	70.8	82.5	7.8	52.7	77.3	87.4	17.9
A102	PHY	47.5	74.1	87.6	10.6	58.3	82.7	93.3	24.0
A103	ESD PROTECTOR	46.2	70.9	77.7	9.4	53.2	77.2	83.2	17.9
A104	REGULATOR	51.8	80.0	90.9	14.3	60.2	85.5	95.2	22.7
A105	EEPROM	40.0	65.8	77.3	2.9	47.8	72.5	82.1	12.9
XT101	CRYSTAL	38.3	64.5	76.3	0.9	47.1	71.9	81.6	12.0
CN103	CONNECTOR	53.1	76.5	79.6	15.9	56.3	80.1	84.7	20.8
CN101	RJ-45 CONNECTOR	33.0	60.9	75.0	-3.9	43.5	68.8	79.5	8.4
A103 amb.	ESD PROTECTOR	47.6	72.8	78.6	10.6	54.0	78.3	83.9	18.1
A105 amb.	EEPROM	39.7	66.3	76.2	2.4	49.0	74.1	82.1	13.5
Q101 amb.	MOSFET	36.5	65.2	76.6	-0.8	48.5	73.0	82.4	13.4
PD101 amb.	LED	31.1	58.3	73.3	-5.3	44.2	69.9	80.4	9.4

Vin.(V)	NOTE	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC	Vin.230VAC
LAN Position		LAN Pos.3	LAN Pos.3	LAN Pos.3	LAN Pos.3	LAN Pos.4	LAN Pos.4	LAN Pos.4	LAN Pos.4
Vout.(V)		24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Io(A)		296.000	296.000	178.000	296.000	296.000	296.000	178.000	296.000
Tamb.(°C)		25.0	50.0	70.0	-10.0	25.0	50.0	70.0	-10.0
REF		24.8	49.7	71.0	-9.2	25.4	50.3	69.7	-10.6
A101	MICROCONTROLLER	53.8	77.9	88.5	17.0	48.9	74.1	85.5	12.6
A102	PHY	59.7	83.5	94.7	23.8	55.3	80.0	91.9	19.5
A103	ESD PROTECTOR	51.2	76.7	83.7	14.9	50.9	77.5	82.6	13.5
A104	REGULATOR	61.5	85.6	95.8	21.5	54.9	82.1	93.1	16.8
A105	EEPROM	49.0	73.2	83.3	12.2	44.0	69.4	80.4	7.8
XT101	CRYSTAL	48.6	72.9	82.9	11.9	43.5	68.8	79.9	7.0
CN103	CONNECTOR	51.6	77.8	84.3	14.5	53.8	80.9	83.9	14.8
CN101	RJ-45 CONNECTOR	44.8	69.5	80.9	8.4	39.7	65.1	77.6	3.4
A103 amb.	ESD PROTECTOR	49.6	76.1	83.4	13.7	50.6	77.4	82.5	12.4
A105 amb.	EEPROM	48.9	73.7	82.8	12.2	44.7	70.4	79.7	7.5
Q101 amb.	MOSFET	49.1	73.6	83.6	12.5	44.3	69.7	80.5	7.8
PD101 amb.	LED	46.4	71.0	82.1	10.2	41.2	66.4	78.9	4.9

DWG.No			
APPROV.	CHECK	ENGR.	DRAWN
Arie G.	Arie G.		
28/11/16	28/11/16	28/11/16	28/11/16

2.COMPONENT DERATING

HFE1600-LAN
used along with 4 units of HFE1600-12/S power supplies

Calculation method

(1) Condition of the power supplies -

Input:	Nominal
Output:	Vout - 100%, Iout - 100%
Ambient temperature:	50°C
Mounting Method:	Standard Mounting

(2) Semiconductors

Compared with maximum junction temperature and actual one which is calculated on case temperature, power dissipation and thermal impedance.

(3) IC, Resistors, Capacitors, etc.

Ambient temperature, operating conditions and power dissipation are within derating criteria.

(4) Calculation method of thermal impedance:

$$\Theta_{j-a} = \frac{Tj(\max) - Ta}{Pc(\max)} \qquad \Theta_{j-c} = \frac{Tj(\max) - Tc}{Pc(\max)} \qquad \Theta_{j-l} = \frac{Tj(\max) - Tl}{Pc(\max)}$$

Tc: Case Temperature at Start Point of Derating; 25°C in General

Ta: Ambient Temperature at Start Point of Derating; 25°C in General

$Pc(\max)$: Maximum Power Dissipation

$Tj(\max)$: Maximum Junction temperature

Θ_{j-c}: Thermal Impedance between Junction and Case

Θ_{j-a}: Thermal Impedance between Junction and Air

Θ_{j-l}: Thermal Impedance between Junction and Lead

MODEL: HFE-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	

PART DERATING :CRYSTAL

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

				Vin:TYP.,Io:TYP.		
No.	PART NAME	ITEM	RATING	Ta	DATA	RATE
XT101	12.88711	Tmax(°C)	85	50	74.4	88%

APPROV.	CHECK	ENGR.	DRAWN
Arie G. 04/12/17	Arie G. 04/12/17	29/11/17	29/11/17

MODEL: HFE-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	

PART DERATING :LED

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

				Vin:TYP.,Io:TYP.				WORST CASE A						WORST CASE B					
No.	PART NAME	ITEM	RATING	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.
PD101	595-2101-013F	VR(V)	4		0	0%	90%	SAME AS TYP					90%	SAME AS TYP					90%
	RED	IF(A)	0.03		0.005	18%	80%	SAME AS TYP					80%	SAME AS TYP					80%
		Ta(°C)	85	50	70.1	82%	100%	SAME AS TYP					100%	SAME AS TYP					100%
		Pd(W)			0.0091														
		θj-c(°C/W)																	
		ΔT(°C)			20.1														
PD102	595-2301-013NF	VR(V)	4		0	0%	90%	SAME AS TYP					90%	SAME AS TYP					90%
	GREEN	IF(A)	0.03		0.004	13%	80%	SAME AS TYP					80%	SAME AS TYP					80%
		Ta(°C)	85	50	70.1	82%	100%	SAME AS TYP					100%	SAME AS TYP					100%
		Pd(W)			0.0084														
		θj-c(°C/W)																	
		ΔT(°C)			20.1														

APPROV.	CHECK	ENGR.	DRAWN
Arie G. 04/12/17	Arie G. 04/12/17	29/11/17	29/11/17

MODEL: HFE-LAN
PROTOTYPE PRN.
JUDGEMENT: OK/ NG

PART DERATING :SWITCH

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

				Vin:TYP.,Io:TYP.				WORST CASE A						WORST CASE B					
No.	PART NAME	ITEM	RATING	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.
SW101	SKRKAHE010	Vmax (V)	12		3.3	28%	90%	SAME AS TYP					90%	SAME AS TYP					90%
		Imax (A)	0.05		0.00033	1%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Tmax(°C)	85	50	74.4	88%	100%	SAME AS TYP					100%	SAME AS TYP					100%
SW102	SKRTLAE010	Vmax (V)	12		3.3	28%	90%	SAME AS TYP					85%	SAME AS TYP					85%
		Imax (A)	0.05		0.003	6%	85%	SAME AS TYP					80%	SAME AS TYP					85%
		Tmax(°C)	85	50	72.2	85%	100%	SAME AS TYP					100%	SAME AS TYP					100%

APPROV.	CHECK	ENGR.	DRAWN
Arie G.	Arie G.	[illegible]	[illegible]
04/12/17	04/12/17	29/11/17	29/11/17

MODEL: HFE-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	

PART DERATING :INDUCTOR

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

				Vin:TYP.,Io:TYP.				WORST CASE A						WORST CASE B					
No.	PART NAME	ITEM	RATING	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.
L101	LQH32PN100MNCL	Tmax(d) ΔT(d)	125	50	75.4 25.4	60%	85%	SAME AS TYP					85%	SAME AS TYP					95%

APPROV.	CHECK	ENGR.	DRAWN
Arie G. 04/12/17	Arie G. 04/12/17	29/11/17	29/11/17

MODEL: HFE -LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	

PART DERATING :TRANSISTOR, FET

MODEL : HFE-LAN GRADE : G3
with HFE1600-12/S x 4

				Vin:TYP.,Vo/Io:TYP.				WORST CASE A						WORST CASE B					
No.	PART NAME	ITEM	RATING	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.
Q101	SSM3K09FU(TE85L,F)	VDS(V)	30		3.3	11%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		IDP(A)	0.8		0.0053	1%	85%	SAME AS TYP					85%	SAME AS TYP					100%
	Rdson(max)=1.2Ω	VGS(V)	20		3.3	17%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Tj(°C)	150	50	79.42133	53%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Pch(W)	0.15																
		θj-a(°C/W)	833																
		ΔT(°C)			29.4														
		PLOSS(W)			0.00003														
Q102	SSM3K09FU(TE85L,F)	VDS(V)	30		3.3	11%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		IDP(A)	0.8		0.0053	1%	85%	SAME AS TYP					85%	SAME AS TYP					100%
	Rdson(max)=1.2Ω	VGS(V)	20		3.3	17%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Tj(°C)	150	50	79.42133	53%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Pch(W)	0.15																
		θj-a(°C/W)	833																
		ΔT(°C)			29.4														
		PLOSS(W)			0.00003														
Q103	SSM3K09FU(TE85L,F)	VDS(V)	30		3.3	11%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		IDP(A)	0.8		0.0022	0%	85%	SAME AS TYP					85%	SAME AS TYP					100%
	Rdson(max)=1.2Ω	VGS(V)	20		12	60%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Tj(°C)	150	50	79.40202	53%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Pch(W)	0.15																
		θj-a(°C/W)	833																
		ΔT(°C)			29.4														
		PLOSS(W)			0.000002														
Q104	SSM3K09FU(TE85L,F)	VDS(V)	30		3.3	11%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		IDP(A)	0.8		0.0022	0%	85%	SAME AS TYP					85%	SAME AS TYP					100%
	Rdson(max)=1.2Ω	VGS(V)	20		12	60%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Tj(°C)	150	50	79.40202	53%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Pch(W)	0.15																
		θj-a(°C/W)	833																
		ΔT(°C)			29.4														
		PLOSS(W)			0.000002														
Q105	SSM3K09FU(TE85L,F)	VDS(V)	30		3.3	11%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		IDP(A)	0.8		0.0022	0%	85%	SAME AS TYP					85%	SAME AS TYP					100%
	Rdson(max)=1.2Ω	VGS(V)	20		12	60%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Tj(°C)	150	50	79.40202	53%	90%	SAME AS TYP					90%	SAME AS TYP					100%
		Pch(W)	0.15																
		θj-a(°C/W)	833																
		ΔT(°C)			29.4														
		PLOSS(W)			0.000002														

***Calculations made using an ambient temperature of 79.4C which is the temperature of the hottest part of the PCB**

APPROV.	CHECK	ENGR.	DRAWN
Arie G.	Arie G.		
04/12/17	04/12/17	29/11/17	29/11/17

PART DERATING :CAPACITOR

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

MODEL: HFE LAN
PROTOTYPE (PRN.)
JUDGEMENT: OK / NG

				Vin:TYP.,Io:TYP.				WORST CASE A						WORST CASE B					
No.	PART NAME	ITEM	RATING	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.
C101	C1608C0G1H221JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C102	C1608C0G1H221JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C103	C1608C0G1H221JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C104	GRM21BC81E475KA12L	Vmax(V) Tmax(°C) ΔT(°C)	25 105	50	3.3 79.4 29.4	13% 76%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C105	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C106	C1608X7R1E105KT	Vmax(V) Tmax(°C) ΔT(°C)	25 125	50	3.3 79.4 29.4	13% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C107,108 C109,C110	Not Assigned																		
C111	GRM1885C1H220JA01D	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C112	GRM1885C1H220JA01D	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C113	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C114	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C115	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C116	C1608X7R1E105KT	Vmax(V) Tmax(°C) ΔT(°C)	25 125	50	1.4 79.4 29.4	6% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C117	C1608X7R1E105KT	Vmax(V) Tmax(°C) ΔT(°C)	25 125	50	1.4 79.4 29.4	6% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C118	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C119	C1608X7R1E105KT	Vmax(V) Tmax(°C) ΔT(°C)	25 125	50	1.4 79.4 29.4	6% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%

***Calculations made using an ambient temperature of 79.4C which is the temperature of the hottest part of the PCB**

APPROV.	CHECK	ENGR.	DRAWN
Arie G. 04/12/17	Arie G. 04/12/17	23/11/17	29/11/17

PART DERATING :CAPACITOR

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

MODEL: HFE LAN	
PROTOTYPE	PRN.
JUDGEMENT:	OK NG

No.	PART NAME	ITEM	RATING	Vin:TYP.,Io:TYP. Ta	DATA	RATE	CRITE.	WORST CASE A Vin	Io	Ta	DATA	RATE	CRITE.	WORST CASE B Vin	Io	Ta	DATA	RATE	CRITE.
C120	C1608X7R1E105KT	Vmax(V) Tmax(°C) ΔT(°C)	25 125	50	1.4 79.4 29.4	6% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C121	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C122	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C123	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C124	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C125	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C126	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C127	GRM21BC81C106KA73L	Vmax(V) Tmax(°C) ΔT(°C)	16 125	50	3.3 79.4 29.4	21% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C128	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C129	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C130	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C131	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7%. 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C132	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C133	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C134	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%

APPROV.	CHECK	ENGR.	DRAWN
Arie G. [illegible]	Alex G. 04/12/17	[illegible] 29/11/17	[illegible] 29/11/17

PART DERATING :CAPACITOR

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

MODEL: HFE LAN
PROTOTYPE PRN.
JUDGEMENT: OK / NG

No.	PART NAME	ITEM	RATING	Vin:TYP.,Io:TYP. Ta	DATA	RATE	CRITE.	WORST CASE A Vin	Io	Ta	DATA	RATE	CRITE.	WORST CASE B Vin	Io	Ta	DATA	RATE	CRITE.
C135	GRM21BC81C106KA73L	Vmax(V) Tmax(°C) ΔT(°C)	16 125	50	3.3 79.4 29.4	21% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C136	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C137	C1608X7R1H103KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C138	C1608C0G1H101JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C139	GRM21BC81E475KA12L	Vmax(V) Tmax(°C) ΔT(°C)	25 105	50	12 79.4 29.4	48% 76%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C140	GRM21BC81C106KA73L	Vmax(V) Tmax(°C) ΔT(°C)	16 125	50	3.3 79.4 29.4	21% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C141	GRM21BC81C106KA73L	Vmax(V) Tmax(°C) ΔT(°C)	16 125	50	3.3 79.4 29.4	21% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C142	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	12 79.4 29.4	24% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C143	GRM21BC81C106KA73L	Vmax(V) Tmax(°C) ΔT(°C)	16 125	50	3.3 79.4 29.4	21% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C144	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C145	GRM31CR71E106KA12L	Vmax(V) Tmax(°C) ΔT(°C)	25 125	50	12 79.4 29.4	48% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C146	ELXY300ELL101MH12D	Vmax(V) Tmax(°C) ΔT(°C)	35 105	50	12 79.4 29.4	34% 76%	95% 95%	SAME AS TYP SAME AS TYP					95% 95%	SAME AS TYP SAME AS TYP					95% 95%
C147	Not Assigned																		
C148	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C149	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C150	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%

APPROV	CHECK	ENGR.	DRAWN
04/12/17	04/12/17	29/11/17	29/11/17

PART DERATING :CAPACITOR

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

MODEL: HFE LAN
PROTOTYPE (PRN.)
JUDGEMENT: OK NG

				Vin:TYP.,Io:TYP.				WORST CASE A						WORST CASE B					
No.	PART NAME	ITEM	RATING	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.
C151	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C152	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C153	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C154	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C155	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	55% 95%	SAME AS TYP SAME AS TYP					55% 95%	SAME AS TYP SAME AS TYP					60% 100%
C156	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C157	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C158	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C159	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C160	Not Assigned																		
C161	C1608X7R1H104KT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C162	C1608C0G1H221JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C163	C1608C0G1H221JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C164	C1608C0G1H221JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C165	C1608C0G1H101JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C166	C1608C0G1H101JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%
C167	C1608C0G1H101JT	Vmax(V) Tmax(°C) ΔT(°C)	50 125	50	3.3 79.4 29.4	7% 64%	60% 95%	SAME AS TYP SAME AS TYP					60% 95%	SAME AS TYP SAME AS TYP					60% 100%

APPROV	CHECK	ENGR.	DRAWN
Ane G. 04/12/17	Ane G. 04/12/17	29/11/17	29/11/17

MODEL: HFE LAN
PROTOTYPE (PRN.)
JUDGEMENT: OK/NG

PART DERATING :RESISTOR

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

			Vin:TYP.,Io:TYP.				WORST CASE A						WORST CASE B					
No.	PART NAME	ITEM	RATING	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.
R101	RK73H1JTTD1501F	Vmax (V)	150	3.3	2.2%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.007	6.8%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R102	RK73H1JTTD1501F	Vmax (V)	150	3.3	2.2%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.007	6.8%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R103	RK73H1JTTD1501F	Vmax (V)	150	3.3	2.2%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.007	6.8%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R104	RK73H1JTTD1000F	Vmax (V)	150	3.3	2.2%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.000	0.0%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R105	RK73H1JTTD1000F	Vmax (V)	150	0.1	0.1%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.000	0.0%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R106	RK73H1JTTD1501F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.007	7.3%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R107	RK73H1JTTD1000F	Vmax (V)	150	0.1	0.1%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.000	0.0%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R108	RK73H2ATTD1800F	Vmax (V)	150	3.3	2.2%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.25	0.009	3.6%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R109	RK73H2ATTD1800F	Vmax (V)	150	3.3	2.2%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.25	0.009	3.6%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R110	Not Assigned																	
R111	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.125	0	0.0%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R112	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.125	0	0.0%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R113	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.125	0	0.0%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R114	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.125	0	0.0%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R115	RK73H1ETTP4871F	Vmax (V)	50	3.3	6.6%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.002	2.2%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R116	RK73H1JTTD1002F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.001	1.1%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R117	RK73H1JTTD1002F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.001	1.1%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R118	RK73H1JTTD1002F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.001	1.1%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R119	RK73H2ATTD3000F	Vmax (V)	150	3.3	2.2%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.25	0.009	3.4%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R120	RK73H2ATTD3000F	Vmax (V)	150	3.3	2.2%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.25	0.009	3.4%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R121	RK73H1JTTD2702F	Vmax (V)	75	3.2	4.3%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.000	0.4%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R122	RK73H1JTTD2702F	Vmax (V)	75	3.2	4.3%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.1	0.000	0.4%	55%	SAME AS TYP					55%	SAME AS TYP					80%
R123	Not Assigned																	
R124	RK73H1JTTD1001F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		Pmax (W)	0.125	0.009	7.2%	55%	SAME AS TYP					55%	SAME AS TYP					80%

APPROV	CHECK	ENGR.	DRAWN
Arie G.	Arie G.	[illegible]	[illegible]
04/12/17	04/12/17	29/11/17	29/11/17

PART DERATING :RESISTOR

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

MODEL: HFE LAN
PROTOTYPE PRN
JUDGEMENT: OK NG

No.	PART NAME	ITEM	Vin:TYP.,Io:TYP. RATING	DATA	RATE	CRITE.	WORST CASE A Vin / Io	Ta	DATA	RATE	CRITE.	WORST CASE B Vin / Io	Ta	DATA	RATE	CRITE.
R125	RK73H1JTTD2702F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP		-		85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.000	0.4%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R126	RK73H1JTTD2702F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.000	0.4%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R127	RK73Z1JTTD	Vmax (V)	-	3.3	-	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	-	-	-	55%	SAME AS TYP				55%	SAME AS TYP				80%
R128	RK73H1JTTD1002F	Vmax (V)	75	12	16.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R129	RK73H1JTTD1002F	Vmax (V)	75	12	16.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R130	RK73H1JTTD1002F	Vmax (V)	75	12	16.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R131	RK73H1JTTD1501F	Vmax (V)	75	0.8	1.1%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.000	0.4%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R132	RK73H1JTTD4701F	Vmax (V)	75	2.5	3.3%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.001	1.3%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R133	RK73B2BTTD101J	Vmax (V)	200	3.3	1.7%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.25	0.109	43.6%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R134	RK73H1JTTD1003F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R135	RK73H1JTTD1003F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.1	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R136	RK73H1JTTD1000F	Vmax (V)	75	0.3	0.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.001	0.7%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R137	RK73Z1JTTD	Vmax (V)	-	3.3	-	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	-	-	-	55%	SAME AS TYP				55%	SAME AS TYP				80%
R138	Not Assigned	Vmax (V)														
		Pmax (W)														
R139	Not Assigned	Vmax (V)														
		Pmax (W)														
R140	Not Assigned	Vmax (V)														
		Pmax (W)														
R141	Not Assigned	Vmax (V)														
		Pmax (W)														
R142	RK73H1JTTD22R0F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.1%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R143	RK73H1JTTD22R0F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.1%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R144	RK73H1JTTD22R0F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.1%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R145	RK73H1JTTD51R0F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.2%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R146	RK73H1JTTD51R0F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.2%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R147	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R148	RK73H1JTTD22R0F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.1%	55%	SAME AS TYP				55%	SAME AS TYP				80%

APPROV	CHECK	ENGR.	DRAWN
Ane G.	AneG		
04/12/17	04/12/17	29/11/17	29/11/17

MODEL: HFE LAN
PROTOTYPE PRN.
JUDGEMENT: OK NG

PART DERATING :RESISTOR

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

			Vin:TYP.,Io:TYP.				WORST CASE A					WORST CASE B				
No.	PART NAME	ITEM	RATING	DATA	RATE	CRITE.	Vin / Io	Ta	DATA	RATE	CRITE.	Vin / Io	Ta	DATA	RATE	CRITE.
R149	RK73H1JTTD22R0F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.1%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R150	RK73H1JTTD22R0F	Vmax (V)	75	3.3	4.4%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.1%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R151	RK73B2BTTD300J	Vmax (V)	200	1.5	0.8%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.25	0.075	30.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R152	RK73B2BTTD300J	Vmax (V)	200	1.5	0.8%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.25	0.075	30.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R153	RK73B2BTTD300J	Vmax (V)	200	1.5	0.8%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.25	0.075	30.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R154	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R155	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R156	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R157	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R158	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R159	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R160	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R161	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R162	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R163	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R164	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R165	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R166	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R167	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R168	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R169	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R170	RK73H1JTTD51R0F	Vmax (V)	75	0	0.0%	85%	SAME AS TYP				85%	SAME AS TYP				85%
		Pmax (W)	0.125	0.000	0.0%	55%	SAME AS TYP				55%	SAME AS TYP				80%
R171	Not Assigned	Vmax (V)														
		Pmax (W)														

APPROV	CHECK	ENGR.	DRAWN
Arie G. 04/12/17	Arie G. 04/12/17	29/11/17	29/11/17

MODEL: HFE-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	

PART DERATING :IC

MODEL : HFE-LAN
with HFE1600-12/S x 4

GRADE : G3

				Vin:TYP.,Io:TYP.				WORST CASE A						WORST CASE B					
No.	PART NAME	ITEM	RATING	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.	Vin	Io	Ta	DATA	RATE	CRITE.
A103	TPD4E1B06DCKR	Vrwm(V)	5.5	-	3.3	60%	95%	SAME AS TYP					95%	SAME AS TYP					95%
		Ta(°C)	125	50	79.4	64%	100%	SAME AS TYP					100%	SAME AS TYP					100%
		θj-a(°C/W)	227.3	-	-	-	-												
		Pd(W)	-	-	-	-	-												
		ΔT (°C)	-	-	29.4	-	-												
A102	DP83848IVVX/NOPB	Vcc(V)	4.2	-	3.3	79%	95%	SAME AS TYP					95%	SAME AS TYP					95%
		Ta(°C)	85	50	75.6	89%	100%	SAME AS TYP					100%	SAME AS TYP					100%
		θj-a(°C/W)	40.1	-	-	-	-												
		Tc(°C)		81.4															
		Pd(W)	0.267	-	-	-	-												
		Tj(°C)	121.5	50	88.21	73%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		ΔT (°C)	-	-	25.6	-	-												
A105	M95080-RDW6TP	Vcc(V)	5.5	-	3.3	60%	95%	SAME AS TYP					95%	SAME AS TYP					95%
		Ta(°C)	85	50	75	88%	100%	SAME AS TYP					100%	SAME AS TYP					100%
		θj-a(°C/W)	-	-	-	-	-												
		Pd(W)	-	-	0.006	-	-												
		ΔT (°C)	-	-	25	-	-												
A104	TPS560200DBVR	Vcc(V)	17		12	71%	95%	SAME AS TYP					95%	SAME AS TYP					95%
		Ta(°C)	125	50	75.4	60%	100%	SAME AS TYP					100%	SAME AS TYP					100%
		θj-c(°C/W)	100																
		Tc(°C)		78.3															
		Pd(W)			0.2														
		Tj(°C)	125	50	98.3	79%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		ΔT (°C)			28.3														
A101	STM32F427ZGT6TR	Vcc(V)	3.6	-	3.3	92%	95%	SAME AS TYP					95%	SAME AS TYP					95%
		Ta(°C)	85	50	75.7	89%	100%	SAME AS TYP					100%	SAME AS TYP					100%
		θj-a(°C/W)	40	-	-	-	-												
		Pd(W)	0.33	-	-	-	-												
		Tj(°C)	105	50	88.9	85%	85%	SAME AS TYP					85%	SAME AS TYP					85%
		ΔT (°C)	-	-	25.7	-	-												

						Rj-c/Rj-a				
			T_a	T_{rise}	P_{loss}	R_{j-c}	Rj-a	T_j	T_{jmax}	DF
	PART NAME									
A102	DP83848IVVX/NOPB		50	31.4	0.267	25.5	-	88.208	121.5	72.59%
A101	STM32F427ZGT6TR		75.7	31.4	0.33	-	40	88.9	105	84.66%

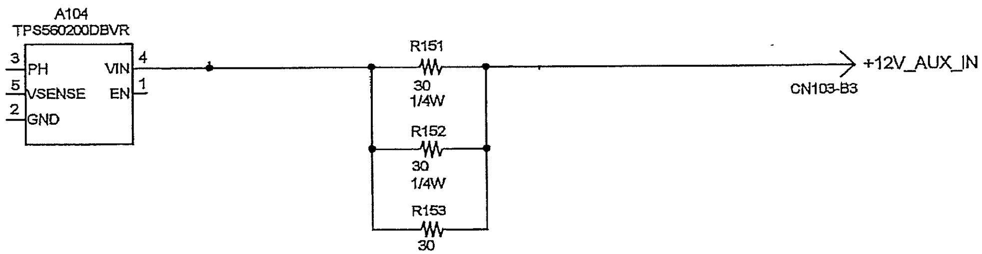
$T_j=T_c+(P_d*R_{jc})$
$=81.4 + (0.267*25.5) = 88.208$

$T_j=T_a+(P_d*R_{ja})$
$= 75.7 + (0.33 * 40) = 88.9$

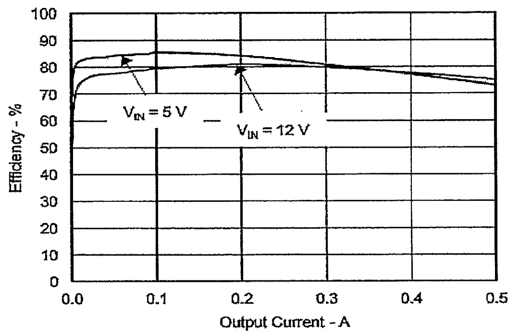
APPROV.	CHECK	ENGR.	DRAWN
Arie G.	Arie G.		
04/12/17	04/12/17	30/11/17	30/11/17

MODEL: HFE-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK NG	

A104 Junction Temperature Calculation



Input Voltage from HFE	12V
Measured drop across the resistors - 0.9V	0.9V
Current input to the regulator = (0.9/30)*3	0.09A
Power Input = (11.1*0.09)	0.999W
Considering efficiency of 80% 0.8=Pout/Pin. Power Output = 0.8 * 0.999	0.799W
Output Current = 0.7999/3.3	0.242A
Power Dissipation = (0.999-0.799)	0.200W
Tj = 78.3 + (0.2*100)	98.3C



APPROV.	CHECK	ENGR.	DRAWN
Arx G.	Arx G.	[signature]	[signature]
04/12/17	04/12/17	30/11/17	30/11/17

Component Derating Criteria Deviating Application

APPD	CHK	ENGR
Arie G. 1/12/17	Arie G. 1/12/17	1\12\17

1. **Model – HFE-LAN**

2. **Grade – G3**

3. **Content of application**

COM or UNI	Component category	Parts No.	Catalog No.	Ratings	Case A		Case B	
					Criteria	DF(Data)	Criteria	DF(Data).
	IC	A104	TPS560200DBVR		85%-Junction Temperature	4%	Same as case A	Same as case A
	IC	A101	STM32F427Z6T6TR		85% - Junction Temperature	8%	Same as case A	Same as case A

4. **Application reason**

The Junction Temperature of A104 is 4% more than the derating criteria. The calculated Junction Temperature is 110.8°C. The manufacturer recommendation is 125°C maximum.

The Junction Temperature of A101 is 8% more than the derating criteria. The calculated Junction Temperature is 98°C. The manufacturer recommendation is 105°C maximum.

5. **Impact of Deviation**

HFE-LAN was checked with 4 x HFE1600-12/S power supplies in a rack. Software reliability test (software loop) was performed @70C and no abnormal effects were found.

MODEL: HFE1600-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	

Electrolytic Capacitor Life

C146 ***E. CAP*** ***ELXZ350ELL101MH12D*** ***100uF*** ***35V*** ***NICHEMI***

No.	Amb. Temp. Ta (°C)	Max. Operating Temp.	Guaranteed Life data (NI-CHEMI)	ΔT case (°C)	Absolute Temp. rise Tx (°C)	Calculated E-cap life Lx (h)	Calculated E-cap life Lx (year)
1	30	105	4000	24.5	54.5	132,514	15.1
2	40	105	4000	24.5	64.5	66,257	7.6
3	50	105	4000	24.5	74.5	33,128	3.8
4	70	105	4000	16.3	86.3	14,621	1.7

DWG.No			
APPROV.	CHECK	ENGR.	DRAWN
Arie G.	Arie G.	[signature]	[signature]
04/12/17	04/12/17	29/11/17	29/11/17

TDK

05/04/2017

HFE LAN Approval

- **HFE 1600 LAN unit – IA816**
- **HFE 2500 LAN unit – IA817**

Table of Contents

Test description

All tests were executed on HFE 2500 LAN units (10 samples), using a HFE2500-48 power module.

Test flowchart for each one of the 10 samples:

1. Flash the CPU with actual firmware (Ver. 01.02)
2. Check IP detection using a LXI discovery tool.
3. Open Web page via Internet Explorer
4. Check if LAN data displayed correctly (See page 4-Home page image).
5. Check communication with power module and readings: voltage, current (See page 4-DC power images).
6. Place 5 samples in TST, and 5 samples it PCT, and wait to tests completion.
7. Check IP detection using a LXI discovery tool.
8. Open Web page via Internet Explorer
9. Check if LAN data displayed correctly (See page 5-Home page image).
10. Check communication with power module and readings: voltage, current (See page 5-DC power images).

Judgment:		
DWG	**Check**	**Appr.**
Yevgeni K. 05/04/2017	06/04/17	06.4.17

TDK 05/04/2017

TST EVALUATION REPORT

MODEL: HFE LAN
Number of Pb-Free samples tested: 5 units.

TEST CONDITIONS	
Test equipment:	TSA-101S-W ['ESPEC']
Min Temperature:	-40°C
Max Temperature:	85°C
Number of hours :	100 (30/30)
Test start date:	19/02/2017
Test end date:	23/02/2017

EVALUATION RESULTS			
Appearance check before and after TST(Pb-Free samples): OK	Judgement	Engineer	Approval
Refer to attached TEST RESULTS	PASS	Yevgeni K.	[signature]

Sample №	Before	After	Judgment
1	OK	OK	PASS
2	OK	OK	PASS
3	OK	OK	PASS
4	OK	OK	PASS
5	OK	OK	PASS

TDK

05/04/2017

PCT EVALUATION REPORT

MODEL: HFE LAN
Number of Pb-Free samples tested: 5 units.

TEST CONDITIONS
Test equipment: EHS-411M ['ESPEC']
Temperature: 105°C
Humidity: 100%
Number of hours : 96
Test start date: 19/02/2017
Test end date: 23/02/2017

EVALUATION RESULTS			
Electrical evaluation before and after PCT(Pb-Free samples): OK	Judgement	Engineer	Approval
Refer to attached TEST RESULTS	PASS	Yevgeni K.	

Sample №	Before	After	Judgment
6	OK	OK	PASS
7	OK	OK	PASS
8	OK	OK	PASS
9	OK	OK	PASS
10	OK	OK	PASS

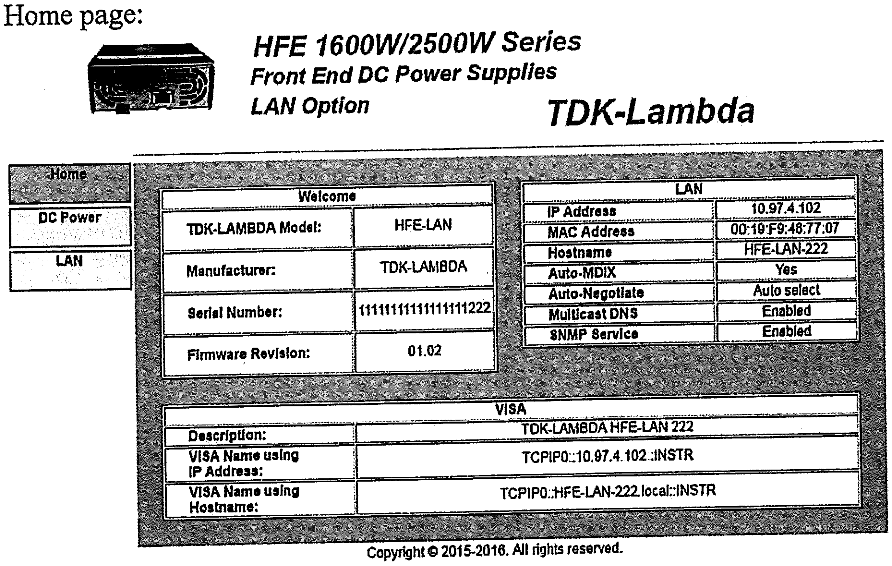
TDK

05/04/2017

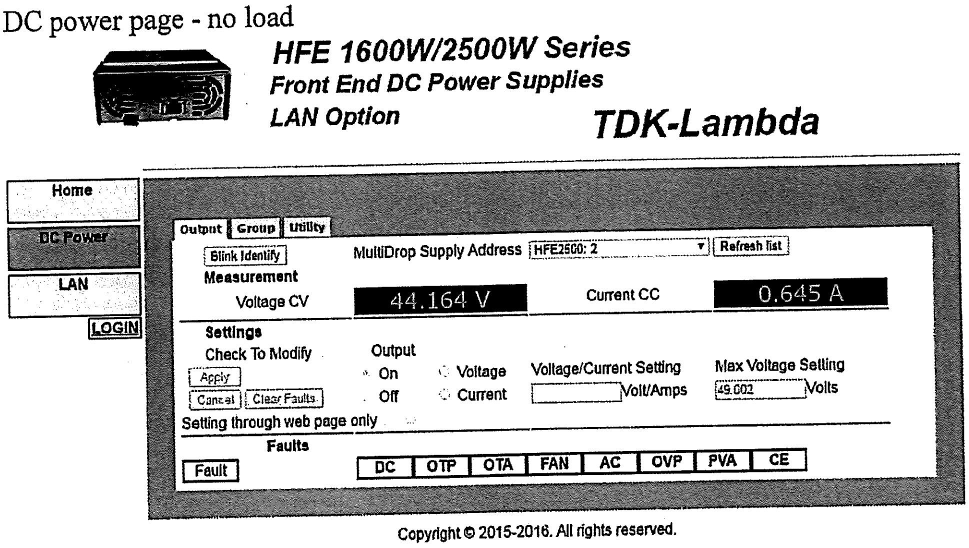
Web interface images

Before

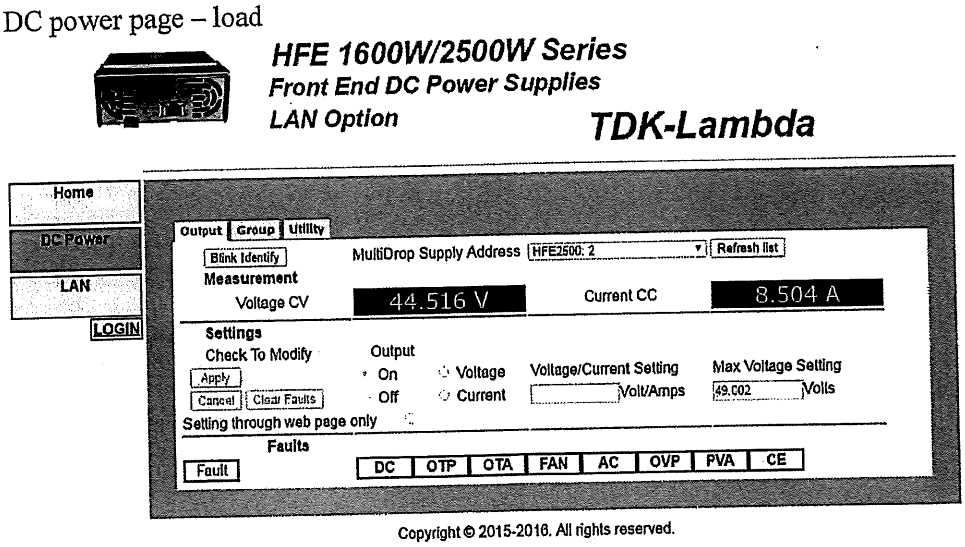
Home page:



DC power page - no load



DC power page – load



TDK 05/04/2017

After

Home page:

HFE 1600W/2500W Series
Front End DC Power Supplies
LAN Option
TDK-Lambda

Home
DC Power
LAN

Welcome	
TDK-LAMBDA Model:	HFE-LAN
Manufacturer:	TDK-LAMBDA
Serial Number:	1111111111111111222
Firmware Revision:	01.02

LAN	
IP Address	10.97.4.102
MAC Address	00:19:F9:48:77.07
Hostname	HFE-LAN-222
Auto-MDIX	Yes
Auto-Negotiate	Auto select
Multicast DNS	Enabled
SNMP Service	Enabled

VISA	
Description:	TDK-LAMBDA HFE-LAN 222
VISA Name using IP Address:	TCPIP0::10.97.4.102::INSTR
VISA Name using Hostname:	TCPIP0::HFE-LAN-222.local::INSTR

DC power page - no load

HFE 1600W/2500W Series
Front End DC Power Supplies
LAN Option
TDK-Lambda

Home
DC Power
LAN
LOGIN

Output | Group | Utility

Blink Identify MultiDrop Supply Address HFE2E00: 2 Refresh list

Measurement
Voltage CV 44.223 V Current CC 0.704 A

Settings
Check To Modify | Output | | Voltage/Current Setting | Max Voltage Setting
Apply | On | Voltage | Volt/Amps | 49.002 Volts
Cancel Clear Faults | Off | Current

Setting through web page only

Faults
Fault | DC | OTP | OTA | FAN | AC | OVP | PVA | CE

DC power page – load

HFE 1600W/2500W Series
Front End DC Power Supplies
LAN Option
TDK-Lambda

Home
DC Power
LAN
LOGIN

Output | Group | Utility

Blink Identify MultiDrop Supply Address HFE2E00: 2 Refresh list

Measurement
Voltage CV 44.575 V Current CC 8.622 A

Settings
Check To Modify | Output | | Voltage/Current Setting | Max Voltage Setting
Apply | On | Voltage | Volt/Amps | 49.002 Volts
Cancel Clear Faults | Off | Current

Setting through web page only

Faults
Fault | DC | OTP | OTA | FAN | AC | OVP | PVA | CE

PCB data:

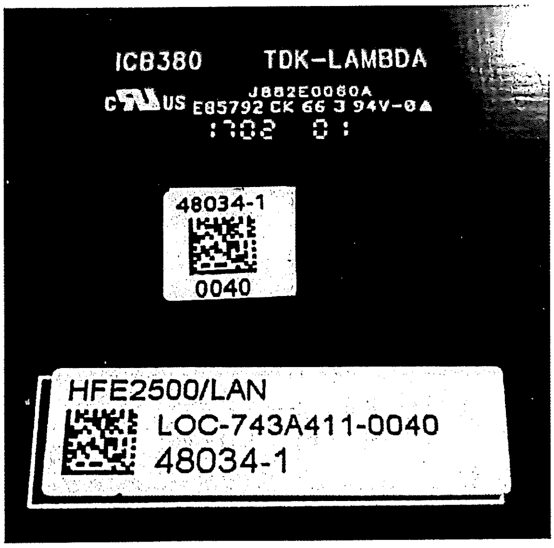
PCB Manufacturer – APCB ELECTRIONCS

PCB revision – ICB380

Visual inspection:

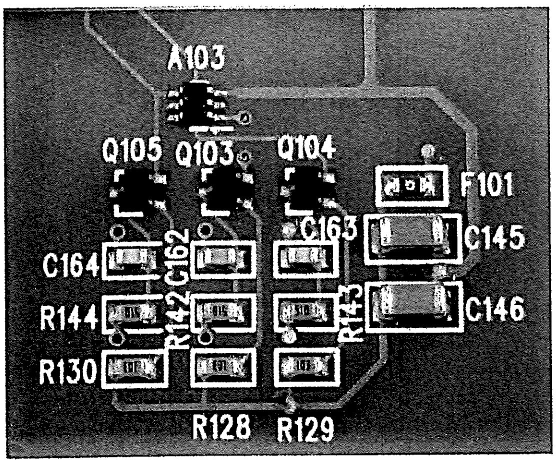
<u>Visual inspection after TST & PCT tests:</u>

PCB labels and marking



Judgment: OK

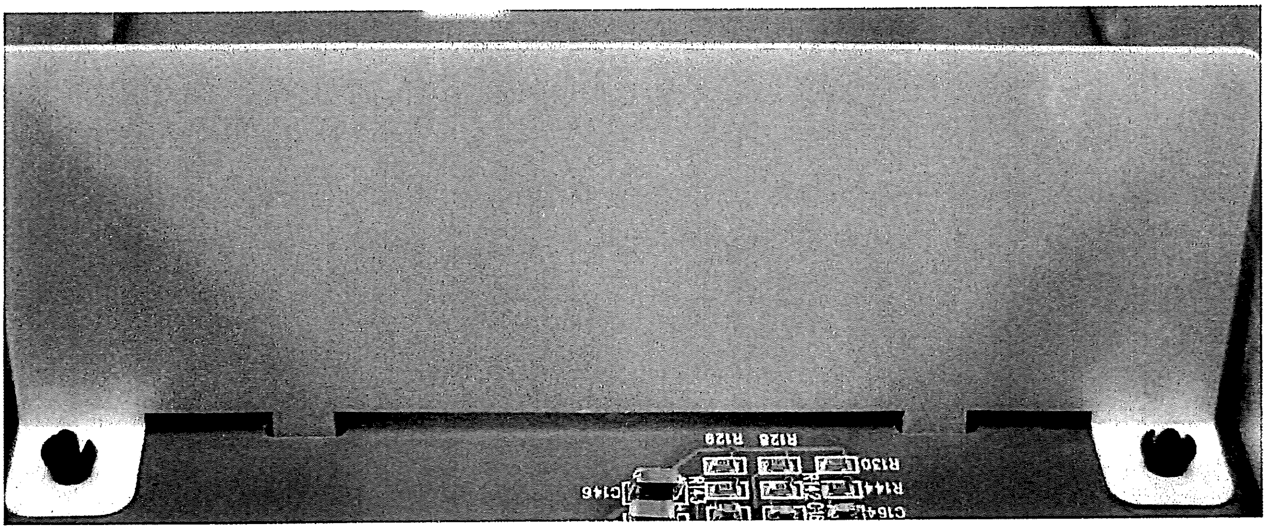
SMT components



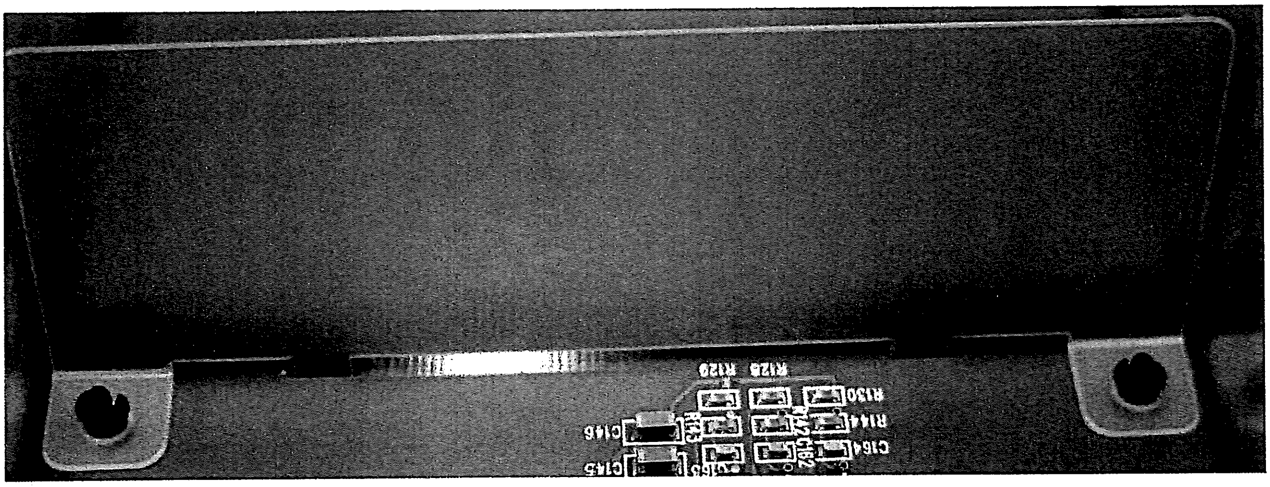
Judgment: OK

Deflector

The material "SunMorfee VS120", with the insulator made from, has changed its color during the PCT test.



No such color change detected after TST test.



Deflector material changed to FR60.

Judgment: OK

TDK

11/12/2017

HUMIDITY EVALUATION REPORT

MODEL: HFE-LAN	
Number of Pb-Free samples tested: 1 unit.	

TEST CONDITIONS	
Test equipment:	SM-16-3800 ['THERMOTRON']
Temperature:	50°C
Humidity:	95%
Number of hours :	500
Test start date:	14/11/2017
Test end date:	05/12/2017

EVALUATION RESULTS			
Electrical evaluation after Humidity (Pb-Free samples): OK	**Judgement**	**Engineer**	**Approval**
Refer to attached TEST RESULTS	PASS	Yevgeni K.	Rabia S

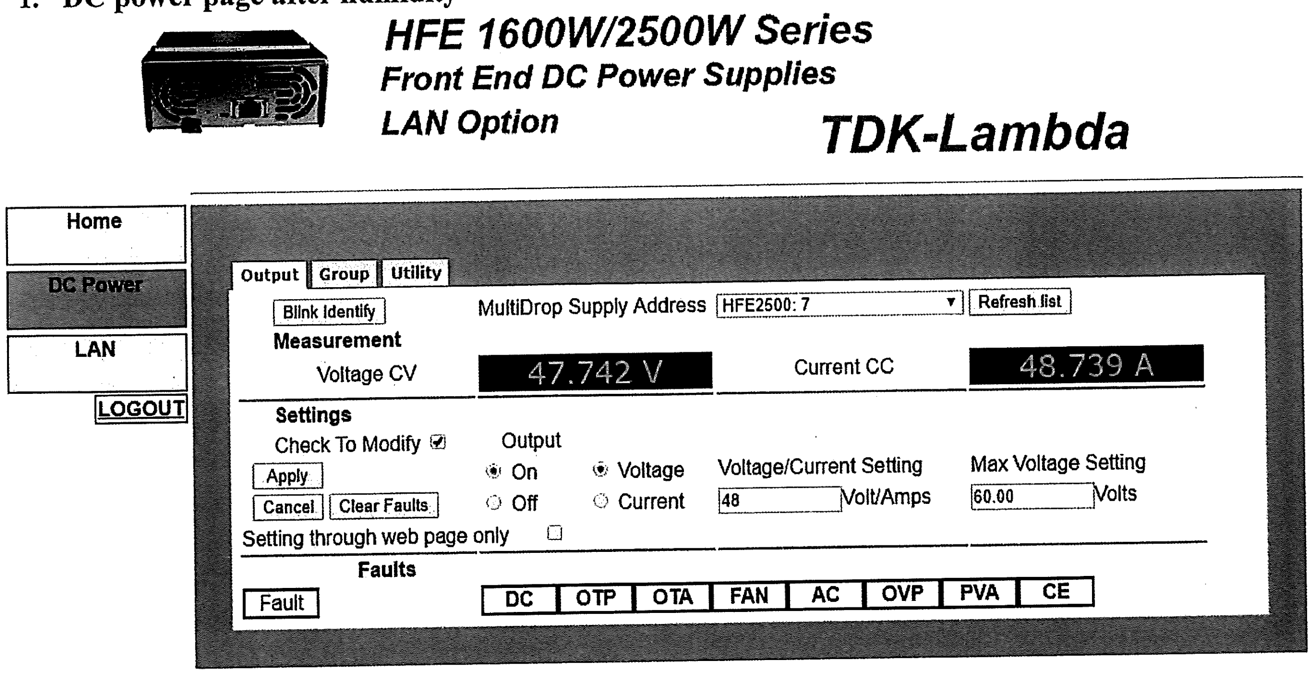
Table of Contents

DWG	Check	Appr.
Yevgeni K. 11/12/2017	13/12/2017	13/12/2017

11/12/2017

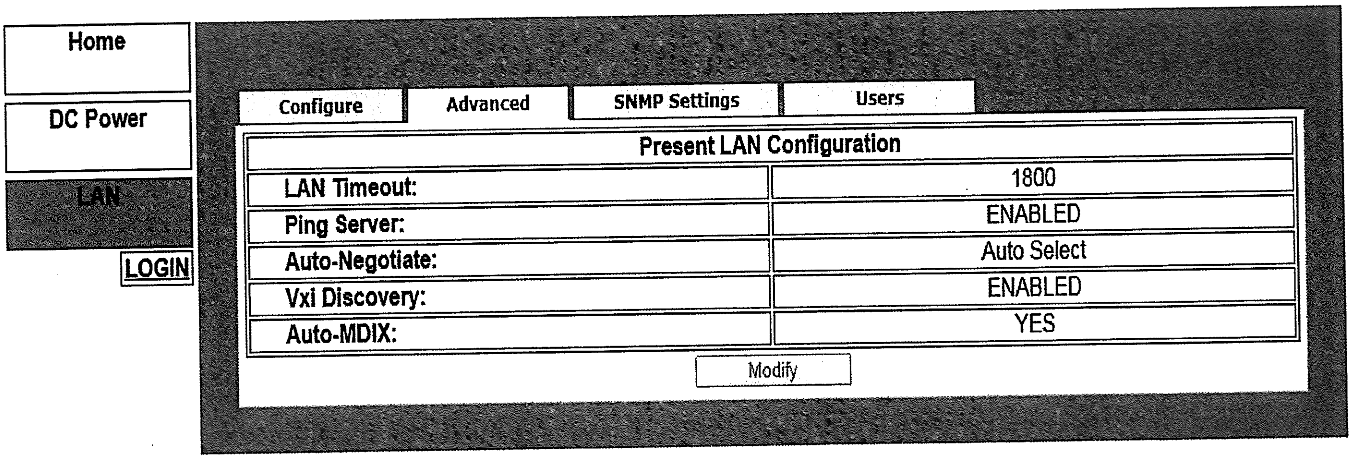
Web interface images

1. DC power page after humidity



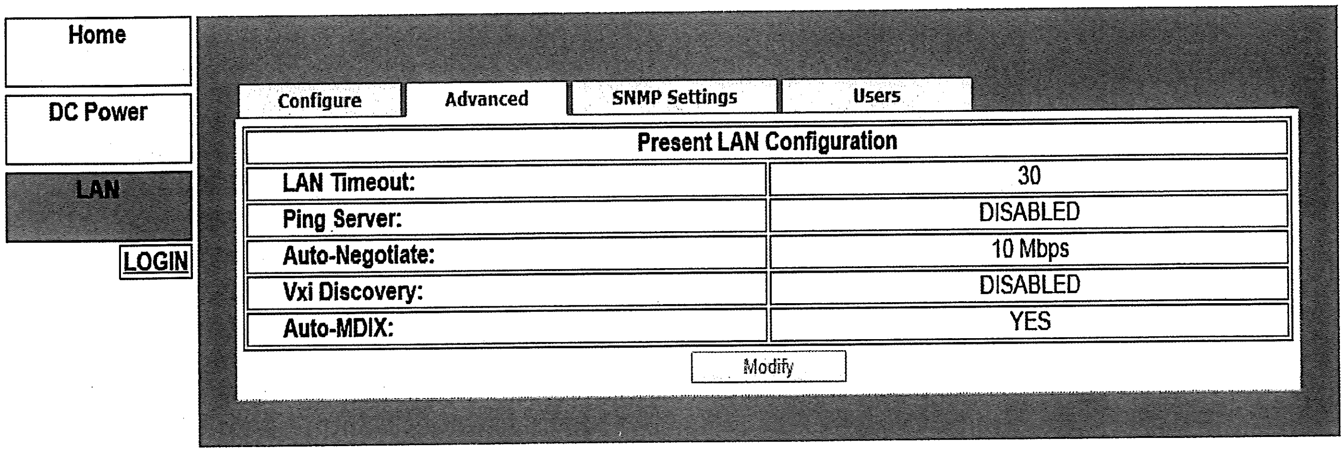
Judgment: OK

2. LAN --> Advanced settings



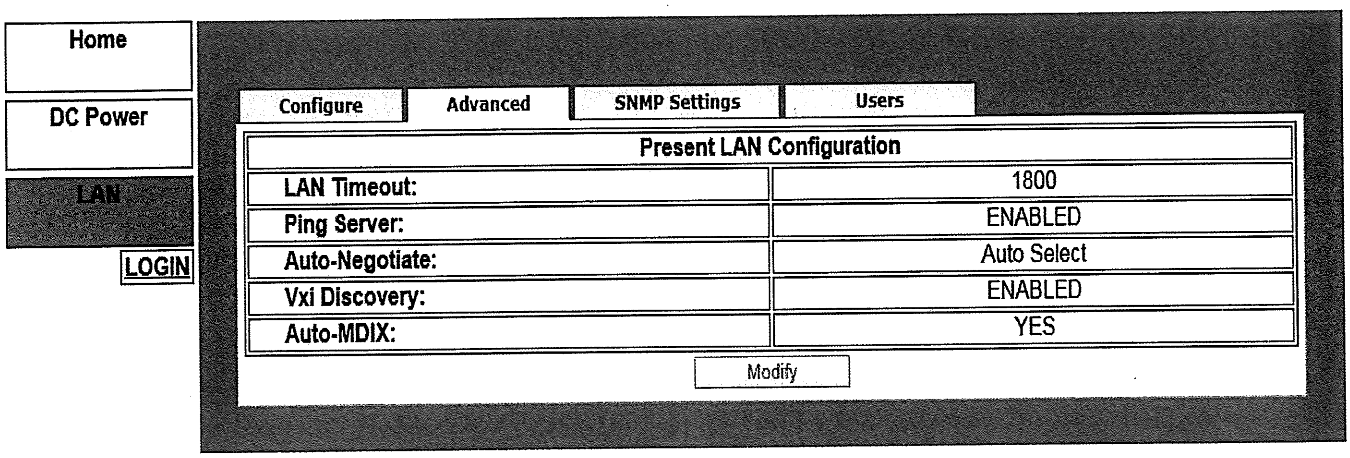
Judgment: OK

3. LAN -->Advanced Settings were changed. AC reset was applied to save the settings and confirm



Judgment: OK

4. LAN reset was applied via the LAN switch to confirm the default settings.



Judgment: OK

PCB data:

PCB Manufacturer – APCB ELECTRIONCS

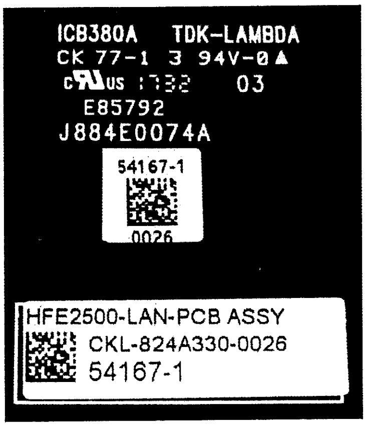
PCB revision – ICB380A

Visual inspection:

1. No cracks in PCB or components detected.
2. No corrosion or oxidation.
3. No broken components.

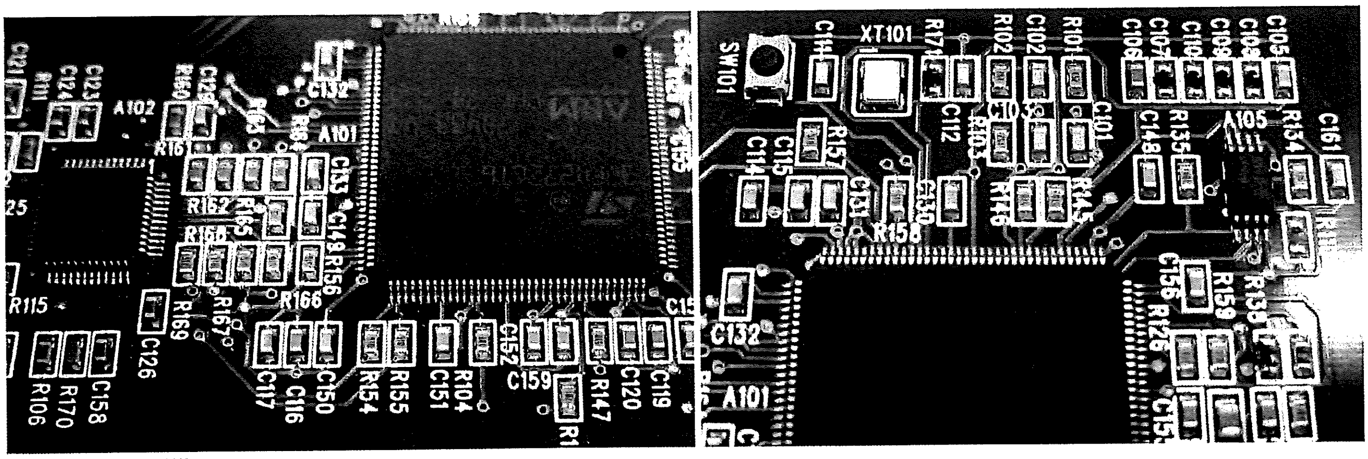
Visual inspection after Humidity test:

PCB labels and marking



Judgment: OK

SMT components



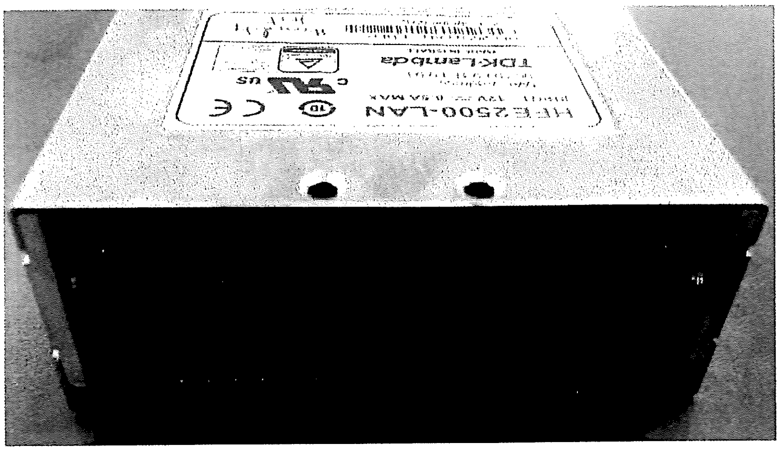
Judgment: OK

Deflector

No color change detected after humidity test. Deflector material - FR60.

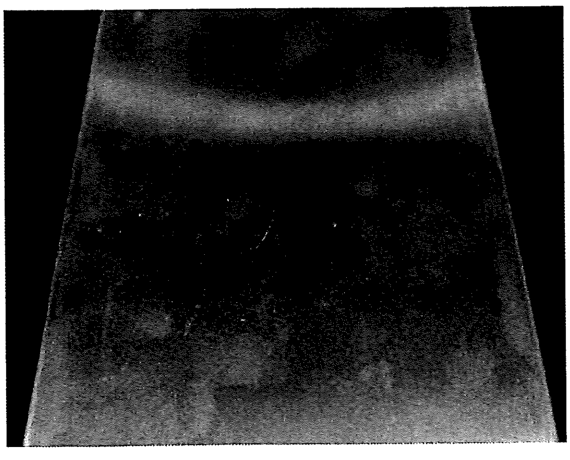
Judgment: OK

External chassis – rear panel



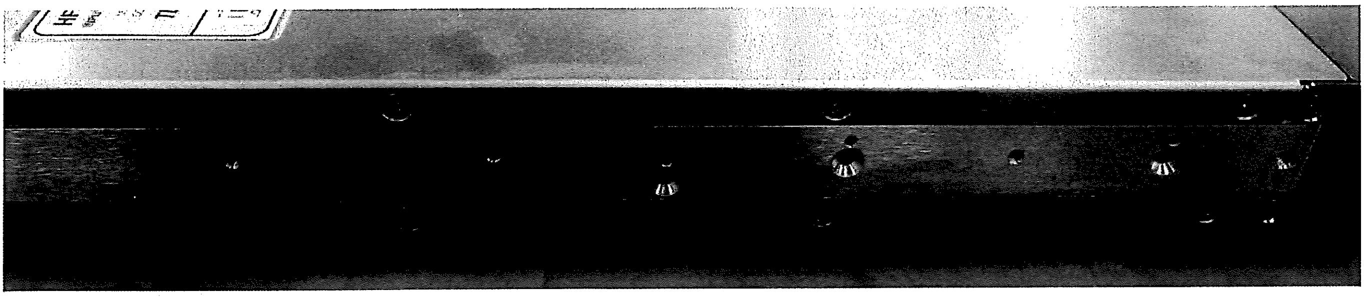
Judgment: OK

External chassis – top cover



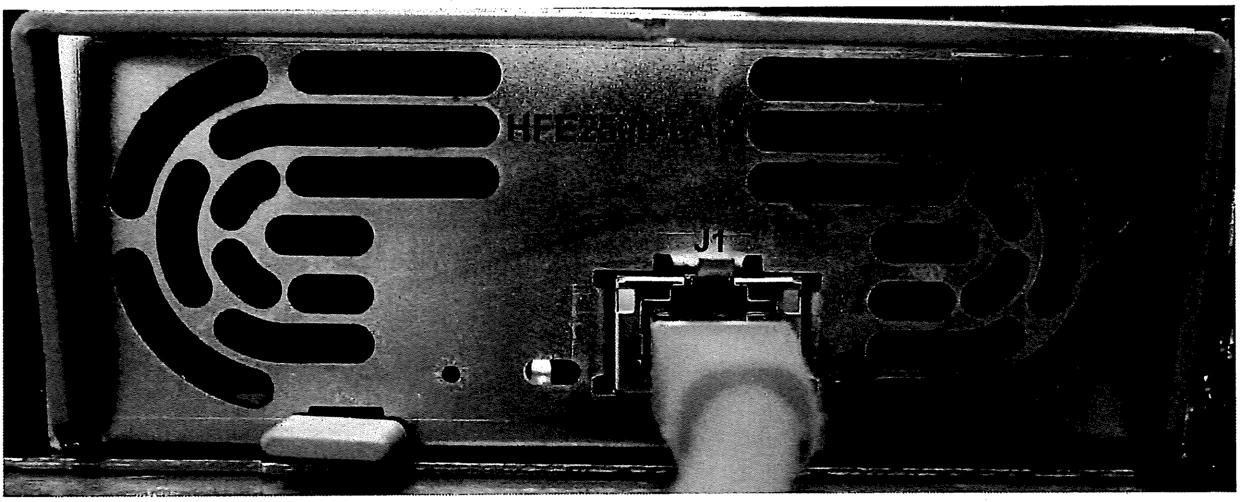
Judgment: OK

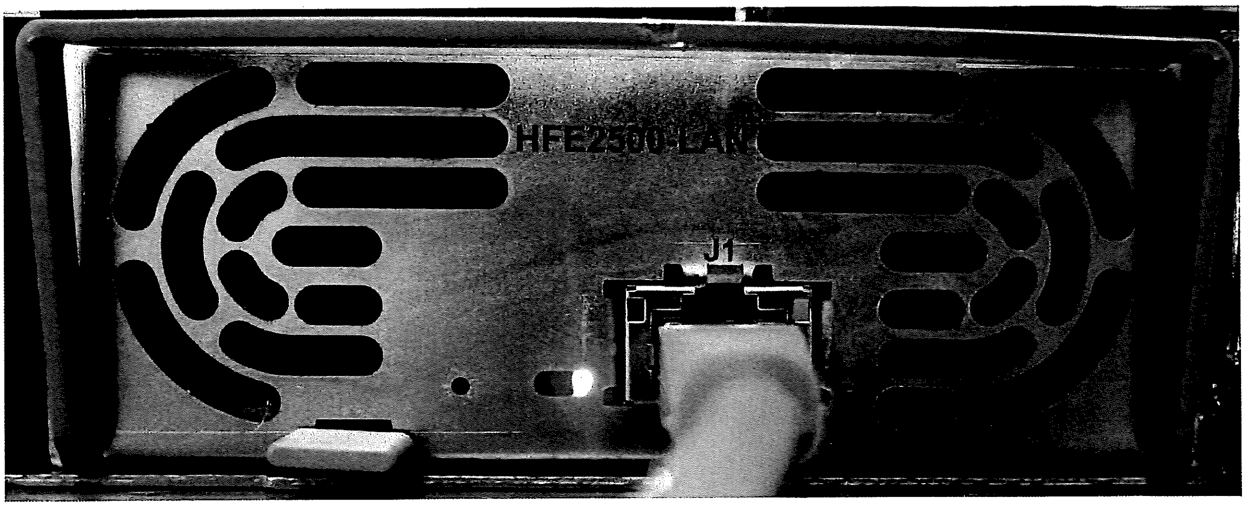
External chassis – side



Judgment: OK

External chassis – Front panel





Judgment: OK

MODEL: HFE2500-LAN	
PROTOTYPE	PRN.
JUDGEMENT: OK / NG	

NOISE SIMULATION TEST

1. TESTED MODELS HFE2500-48_LAN

2. TEST EQUIPMENT:

NoiseKen INS-4040- impulse noise simulator
NoiseKen IJ-4050- coupling decoupling network

3. ACCEPTANCE CRITERIA:

No damage to PS
No output shutdown
No other abnormalities

4. TEST CONDITION:

Ta=25°C
Noise level- ± (0.6kV, 1,2kV, 1.8kV, 2.4kV) (50Ω term.)
Pulse width- 50ns ~ 1us
Injection phase (AC input only) - 0°~360° (with step 45°)
Input voltage - 230Vac
Load - Full Load
Output voltage - Nominal

5. TEST RESULT:

No damage to PS
No output shutdown
No other abnormalities

Pulse	Polarity	Line-Neutral	Line-FG	Neutral-FG
2.4kV	+	OK		
2.4kV	-	OK		
2.4kV	+		OK	OK
2.4kV	-		OK	OK

DWG.No			
APPROV.	CHECK	ENGR.	DRAWN
Arie G.	TDN		
26/11/16	20/11/16	26/11/16	26/11/16