

## Features

- Ultra High Efficiency (Up to 91%)
- High Power Factor (0.99 Typical)
- Constant Current Output
- Lightning Protection
- Dimming Function
- All-Around Protection: OVP, SCP, OTP
- Waterproof (IP67) and Damp & Wet Location



## Description

The EUC-096SxxxDT(ST) series operate from a 90 ~ 305 Vac input range. They are designed to be highly efficient and highly reliable. Features include dimming function, lightning protection, over voltage protection, short circuit protection, and over temperature protection.

## Models

Output Current	Input Voltage Range	Output Voltage Range	Max. Output Power	Typical Efficiency (1)	Power Factor		Model Number (2)
					120Vac	220Vac	
350 mA	90 ~ 305 Vac	137-274 Vdc	96 W	91.0%	0.99	0.96	EUC-096S035DT(ST)(8)
450 mA	90 ~ 305 Vac	106-213 Vdc	96 W	91.0%	0.99	0.96	EUC-096S045DT(ST)(8)
700 mA	90 ~ 305 Vac	68-137 Vdc	96 W	90.0%	0.99	0.96	EUC-096S070DT(ST)(8)
1050 mA	90 ~ 305 Vac	46-92.0 Vdc	96 W	90.0%	0.99	0.96	EUC-096S105DT(ST)(8)(9)
1400 mA	90 ~ 305 Vac	35-69.0 Vdc	96 W	89.0%	0.99	0.96	EUC-096S140DT(ST)(8)(9)
1750 mA	90 ~ 305 Vac	27-54.8 Vdc	96 W	89.0%	0.99	0.96	EUC-096S175DT(ST)(5)(9)
2100 mA	90 ~ 305 Vac	22-45.7 Vdc	96 W	88.0%	0.99	0.96	EUC-096S210DT(ST)(5)(9)
2450 mA	90 ~ 305 Vac	19-39.1 Vdc	96 W	88.0%	0.99	0.96	EUC-096S245DT(ST)(4)(7)(9)
2800 mA	90 ~ 305 Vac	17-34.2 Vdc	96 W	88.0%	0.99	0.96	EUC-096S280DT(ST)(4)(7)(9)
3150 mA	90 ~ 305 Vac	15-30.4 Vdc	96 W	87.0%	0.99	0.96	EUC-096S315DT(ST)(4)(7)(9)
3500 mA	90 ~ 305 Vac	13-27.4 Vdc	96 W	87.0%	0.99	0.96	EUC-096S350DT(ST)(4)(7)(9)
4000 mA	90 ~ 305 Vac	12-24.0 Vdc	96 W	87.0%	0.99	0.96	EUC-096S400DT(ST)(4)(6)(9)

- Notes:**
- (1) Measured at 25°C, full load and 220 Vac input.
  - (2) A suffix –xxxx may be added to denote variations or modifications to the base product, where x can be any alphanumeric character or blank.
  - (3) The DT suffix may be changed to ST to omit the dimming function and remove the three wires associated with that function.
  - (4) Class 2 output (USR & CNR) for dry and damp location.
  - (5) Class 2 output (USR), Non-Class 2 output (CNR) for dry and damp location.
  - (6) Class 2 output (USR & CNR) for wet location.
  - (7) Class 2 output (CNR), Non-Class 2 output (USR) for wet location.
  - (8) Non-Class 2 output (USR & CNR).
  - (9) SELV Output

## Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input Voltage Range	90 V	-	305 V	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	1 mA	At 277Vac 60Hz input
Input AC Current	-	-	1.2 A	Measured at full load and 100 Vac input.
	-	-	0.6 A	Measured at full load and 220 Vac input.
Inrush current	-	-	69 A	At 220Vac input, 25°C Cold Start, Duration=2 mS, 10%Ipk-10%Ipk
Inrush Current(I <sup>2</sup> t)	-	-	2.8 A <sup>2</sup> s	
Power Factor	0.90	-	-	At 100Vac-277Vac, 75%load-100%load
THD	-	-	20%	At 100Vac-277Vac, 75%load-100%load

## Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%	-	5%	
No Load Output Voltage				
I <sub>o</sub> = 350 mA	-	279 V	-	
I <sub>o</sub> = 450 mA	-	219 V	-	
I <sub>o</sub> = 700 mA	-	141 V	-	
I <sub>o</sub> = 1050 mA	-	94.0 V	-	
I <sub>o</sub> = 1400 mA	-	71.0 V	-	
I <sub>o</sub> = 1750 mA	-	56.5 V	-	
I <sub>o</sub> = 2100 mA	-	47.5 V	-	
I <sub>o</sub> = 2450 mA	-	40.5 V	-	
I <sub>o</sub> = 2800 mA	-	35.5 V	-	
I <sub>o</sub> = 3150 mA	-	31.5 V	-	
I <sub>o</sub> = 3500 mA	-	28.5 V	-	
I <sub>o</sub> = 4000 mA	-	25.0 V	-	
Ripple and Noise (pk-pk)	-	-	30% I <sub>o</sub>	Measured by 20 MHz bandwidth oscilloscope and the output paralleled a 0.1 uF ceramic capacitor and a 10 uF electrolytic capacitor
Line Regulation	-	-	±1%	
Load Regulation	-	-	±3%	
Turn-on Delay Time	-	1.0 s	2.0 s	Measured at 120Vac input.
	-	1.0 s	2.0 s	Measured at 220Vac input.
Temperature coefficient	-	-	0.03%/°C	Case temperature = 0°C ~T <sub>c</sub> max

**Note:** All specifications are typical at 25 °C unless stated otherwise.

## Protection Functions

Parameter	Min.	Typ.	Max.	Notes
Over Temperature Protection-Tc	-	110 °C	-	Maximum temperature of components inside the case. The power supply shall be self-recovery when the fault condition is removed.
Short Circuit Protection	No damage shall occur when any output operating in a short circuit condition. The power supply shall be self-recovery when the fault condition is removed.			

## General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency <i>I</i> <sub>o</sub> = 350 mA <i>I</i> <sub>o</sub> = 450 mA <i>I</i> <sub>o</sub> = 700 mA <i>I</i> <sub>o</sub> = 1050 mA <i>I</i> <sub>o</sub> = 1400 mA <i>I</i> <sub>o</sub> = 1750 mA <i>I</i> <sub>o</sub> = 2100 mA <i>I</i> <sub>o</sub> = 2450 mA <i>I</i> <sub>o</sub> = 2800 mA <i>I</i> <sub>o</sub> = 3150 mA <i>I</i> <sub>o</sub> = 3500 mA <i>I</i> <sub>o</sub> = 4000 mA	87.0% 87.0% 86.0% 86.0% 85.0% 85.0% 84.0% 84.0% 84.0% 83.0% 83.0% 83.0%	89.0% 89.0% 88.0% 88.0% 87.0% 87.0% 86.0% 86.0% 86.0% 85.0% 85.0% 85.0%	- - - - - - - - - - - -	Measured at full load, 120Vac input, 25°C ambient temperature, after the unit is thermally stabilized. It will be about 2.5% lower, if measured immediately after startup.
Efficiency <i>I</i> <sub>o</sub> = 350 mA <i>I</i> <sub>o</sub> = 450 mA <i>I</i> <sub>o</sub> = 700 mA <i>I</i> <sub>o</sub> = 1050 mA <i>I</i> <sub>o</sub> = 1400 mA <i>I</i> <sub>o</sub> = 1750 mA <i>I</i> <sub>o</sub> = 2100 mA <i>I</i> <sub>o</sub> = 2450 mA <i>I</i> <sub>o</sub> = 2800 mA <i>I</i> <sub>o</sub> = 3150 mA <i>I</i> <sub>o</sub> = 3500 mA <i>I</i> <sub>o</sub> = 4000 mA	89.0% 89.0% 88.0% 88.0% 87.0% 87.0% 86.0% 86.0% 86.0% 85.0% 85.0% 85.0%	91.0% 91.0% 90.0% 90.0% 89.0% 89.0% 88.0% 88.0% 88.0% 87.0% 87.0% 87.0%	- - - - - - - - - - - -	Measured at full load, 220Vac input, 25°C ambient temperature, after the unit is thermally stabilized. It will be about 2.5% lower, if measured immediately after startup.
MTBF	-	202,000 Hours	-	Measured at 120Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	120,000 Hours	-	Measured at 120Vac input, 80%load; Case temperature=60°C @ Tc point. See life time vs. Tc curve for the details
Case Temperature	-	-	89°C	
Dimensions Inches (L x W x H) Millimeters (L x W x H)	6.85 x 2.66 x 1.44 174 x 67.5 x 36.5			
Net Weight	-	850 g	-	

**Note:** All specifications are typical at 25 °C unless stated otherwise.

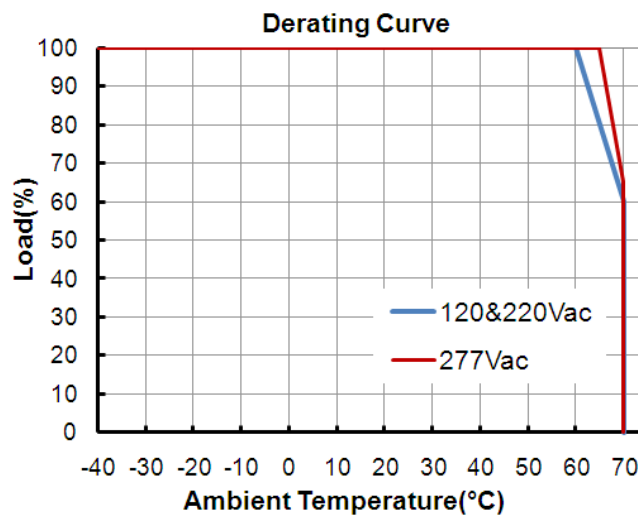
## Environmental Specifications

Parameter	Min.	Typ.	Max.	Notes
Operating Temperature	-40°C	-	+70 °C	Humidity: 10% RH to 100% RH See Derating Curve for more details
Storage Temperature	-40 °C	-	+85 °C	Humidity: 5% RH to 100% RH

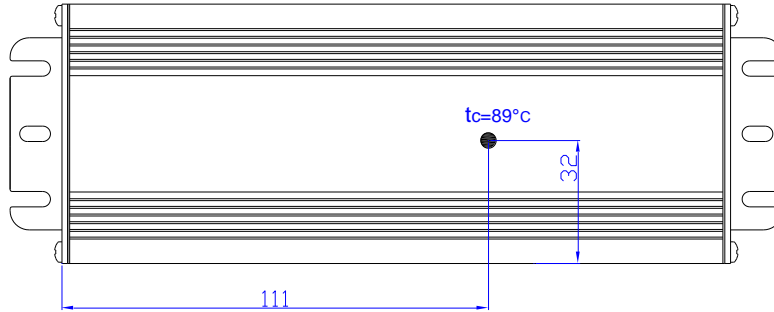
## Safety & EMC Compliance

Safety Category	Standard
UL/CUL	UL8750, UL1310, UL1012, CSA C22.2 No. 223-M91, CSA-C22.2 No. 107.1
CE	EN 61347-1, EN61347-2-13
EMI Standards	Notes
EN 55015	Conducted emission Test & Radiated emission Test
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage fluctuations & flicker
FCC Part 15	ANSI C63.4: 2009 Class B
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge (ESD): 15 kV air discharge, 8 kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient / Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: line to line 4 kV, line to earth 6 kV
EN 61000-4-6	Conducted Radio Frequency Disturbances Test-CS
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips
EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment

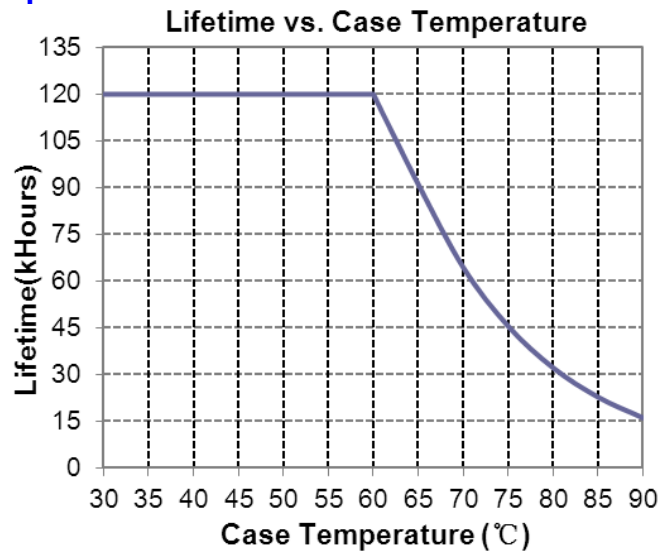
## Derating Curve



## Max. Case Temperature



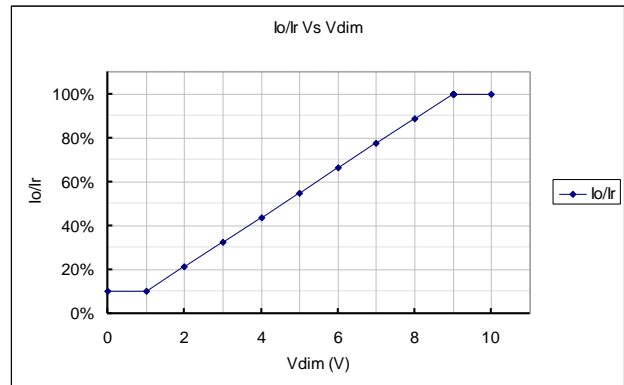
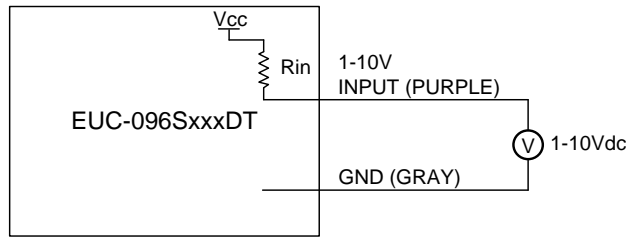
## Lifetime vs. Case Temperature Curve



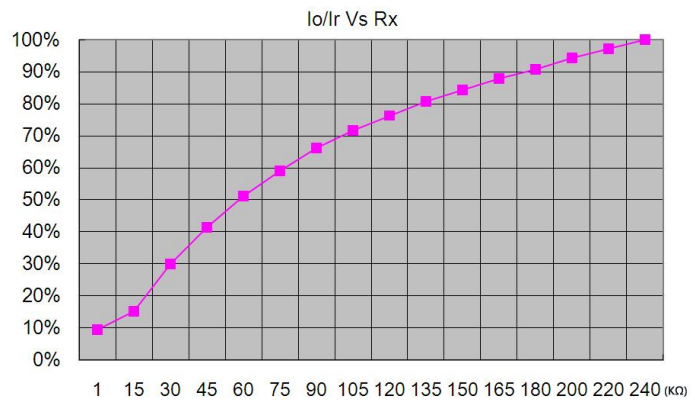
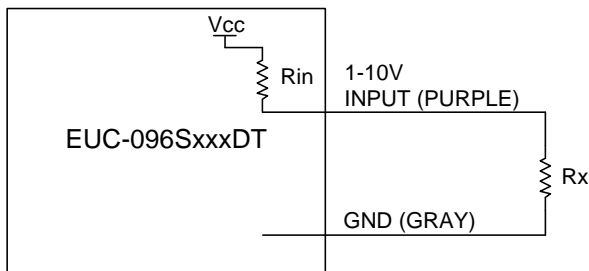
## Dimming Control (On secondary side)

Parameter	Min.	Typ.	Max.	Notes
Absolute maximum voltage on the 1~10V input pin	0 V	-	12 V	
Source current on 1~10V input pin	0 mA	-	0.5 mA	
Value of Rin ( the resistor inside the LED driver which locate between the 1-10V input and Vcc output pin)	19.8 K	20 K	20.2 K	

The dimmer control is operated from an input signal of 1 – 10 Vdc. Recommended implementations are provided below.



**Implementation 1: DC input**



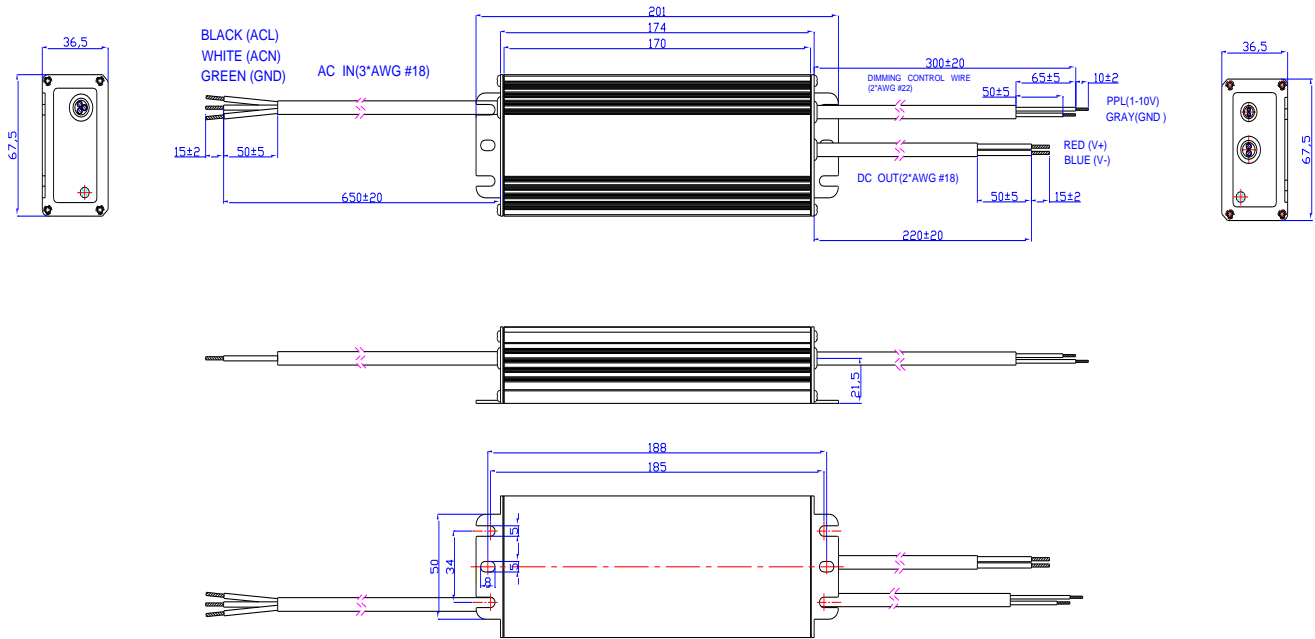
**Implementation 2: External resistor**

**Notes:**

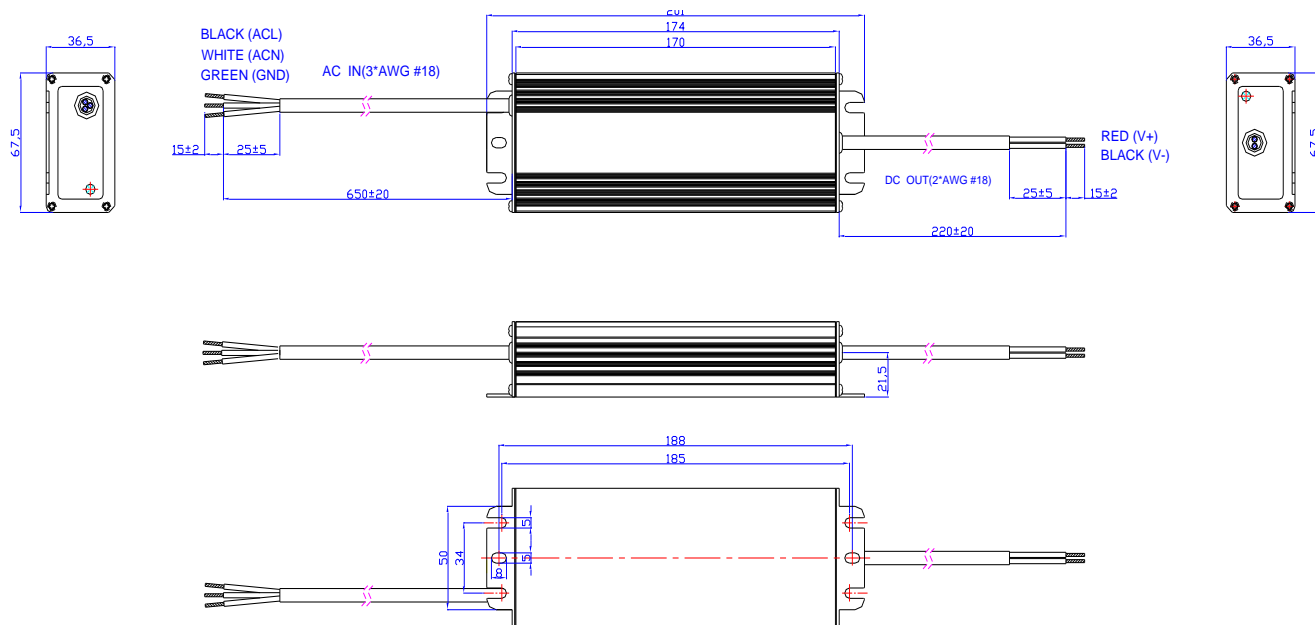
1.  $I_o$  is actual output current and  $I_r$  is rated current without dimming control.
2. For the driver to operate properly, the load voltage must be maintained above the minimum voltage threshold (approx. 50% of the max. output voltage for any given model).
3. If the output voltage is maintained above 50% of the maximum output voltage, the dimming control may be operated over the entire 1-10V range with output current varying from 10% to 100% of  $I_r$ .
4. The dimming signal is allowed to be less than 1V, however, when it is 0-1V, the output current is 10% $I_o$ .
5. Do not connect the GND of dimming to the output cable; otherwise, the LED driver cannot work normally.

## Mechanical Outline

### EUC-096SxxxDT



### EUC-096SxxxST



## RoHS Compliance

Our products comply with the European Directive 2002/95/EC, calling for the elimination of lead and other hazardous substances from electronic products.

## Revision History

Change Date	Rev.	Description of Change				
		Item	From		To	
2010-12-21	A	Change PF at 220Vac	0.95		0.96	
		Change the notes for models	/		/	
		Delete Derating Curve	/		/	
		Add Max. Case Temperature	/		tc: 89 °C	
		Add another dimming version with pull-down resistor	/		/	
		Update safety standards	/		/	
		Add FCC Part15 Class B	/		FCC Part 15 Class B, ANSI C63.4: 2009.	
		Update mechanical Outline	/		/	
2011-07-08	B	Features	Up to 92%		Up to 91%	
		Models-Typical Efficiency	92%, 92%...		91%, 91%...	
		Input Specifications-Input AC Current	1.2A		1.3A	
		Input Specifications-Inrush Current	50A		69A	
2011-07-08	B	Output Specifications-No Load Output Voltage	278V,216V,140V,95V,72V,57V,48V,42V,37V,32V,29V,26V		279V,219V,141V,94V,71V,56.5V,47.5V,40.5V,35.5V,31.5V,28.5V,25V	
		Output Specifications-Ripple and Noise	3%Vo		Io x 30%	
		Output Specifications-Turn-on Delay Time	0.8S	1S	1S	3S
			0.8S	1S	0.8S	2S
		Protection Functions-OVP	/		Delay	
		General Specifications-Tpy	/		All minus 1%	
General Specifications-Notes	1%		2%-3%			
2012-01-31	C	Photo	/		Changed	
2012-05-17	D	All Models-Min Efficiency	/		1% Lower	
2012-5-25	E	Input Current @100V	1.3A		1.2A	
2012-06-08	F	Life Time Curve	/		Added	
2012-07-05	G	Io/Ir Vs Rx Curve	/		Updated	
2012-07-17	H	Max Case Temperature	/		Updated	
		EN61000-4-5	line to line 2 kV, line to earth 4 kV		line to line 4 kV, line to earth 6 kV	
2012-08-03	I	Operating Temperature/ Derating Curve	-35°C		-40°C	
		Class 2 Details	/		Updated	
		Turn-on delay time	1s	3s	1s	2s
0.8s	2s		1s	2s		
2012-9-19	J	MTBF & Life time Typical	/		Added	
		Life time Curve	/		Updated	
		Min PF, Max THD, Temperature Coefficient	/		Added	
2015-11-20	K	Lifetime	/		Updated	



		Lifetime vs. Case Temperature Curve	/	Updated
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