Wireless
60W Multiple-Stage Output Current LED Power Supply **LCM-60EO series**

Features :

- Wireless LED driver with integrated EnOcean module
- Output current level selectable by DIP S.W.
- 180~295VAC input only
- Built-in active PFC function
- Protections: Short circuit / Over voltage / Over temperature
- Cooling by free air convection
- Class Ⅱ power unit, no FG
- Built-in 0~10Vdc or PWM signal or resistance dimming function(NTC is not used)
- Fully isolated plastic case
- IP20 design
- Temperature compensation function by external NTC
- Power supplies synchronization function up to 10 units
- Suitable for indoor LED lighting applications
- 3 years warranty

TAIWAN EXCELLENCE 2014

SPECIFICATION

enocean alliance SELV PENDING PENDING

MODEL		LCM-60EO					
OUTPUT	SELECTABLE CURRENT Note.3	500mA	600mA	700mA	900mA	1050mA	1400mA
	DC VOLTAGE RANGE	2 ~ 90V	2 ~ 90V	2 ~ 86V	2 ~ 67V	2 ~ 57V	2 ~ 42V
	RATED POWER	60.3W					
	RIPPLE CURRENT	±5%					
	RIPPLE & NOISE (max.) Note.2	700mVp-p					
	NO LOAD OUTPUT VOLTAGE (max.)	95V			73V		
	CURRENT ACCURACY	±5.0%					
	SETUP, RISE TIME Note.5	500ms, 80ms / 230VAC at rated power					
	HOLD UP TIME (Typ.)	16ms/230VAC at rated power					
INPUT	VOLTAGE RANGE Note.4	180 ~ 295VAC 254 ~ 417VDC					
	FREQUENCY RANGE	47 ~ 63Hz					
	POWER FACTOR (Typ.)	PF≧0.975/230VAC, PF≧0.96/277VAC at rated power (Please refer to "Power Factor Characteristic" curve)					
	TOTAL HARMONIC DISTORTION	Total harmonic distortion will be lower than 20% when output loading is 75% or higher					
	EFFICIENCY (Typ.) Note.6	92%					
	AC CURRENT (Typ.)	0.32A/230VAC 0.27A/277VAC					
	INRUSH CURRENT(Typ.)	COLD START 20A(t_{width}=270μs measured at 50% I_{peak}) at 230VAC					
	MAX. No. of PSUs on 16A CIRCUIT BREAKER	25 units (circuit breaker of type B) / 32 units (circuit breaker of type C) at 230VAC					
	LEAKAGE CURRENT	<0.5mA / 240VAC					
PROTECTION	SHORT CIRCUIT	Constant current limiting, recovers automatically after fault condition is removed					
	OVER VOLTAGE	105 ~ 125V					
		Protection type : Shutdown o/p voltage, re-power on to recover					
	OVER TEMPERATURE	Shut down o/p voltage, re-power on to recover					
FUNCTION	WIRELESS PROTOCOL	EnOcean standard 868 MHz for Europe (Optional: 902 MHz for USA/ Canada); Max. device(switch) saved into the memory : 33					
	TEMP. COMPENSATION	By external NTC(not provide with the power supply), please see "Temperature Compensation Operation"					
	DIMMING	Please see "Dimming Operation"					
	SYNCHRONIZATION	Please see "Synchronization Operation"					
ENVIRONMENT	WORKING TEMP.	-30 ~ +60℃ (Refer to "Derating Curve")					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +80℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes					
SAFETY & EMC	SAFETY STANDARDS	UL8750, CSA C22.2 No.250.13-12, ENEC EN61347-1, EN61347-2-13, EN62384 independent,GB19510.14,GB19510.1 approved					
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC					
	ISOLATION RESISTANCE	I/P-O/P:>100M Ohms / 500VDC / 25℃/ 70% RH					
	EMC EMISSION	Compliance to EN55015, EN61000-3-2 Class C(≧40% rated power) ; EN61000-3-3; GB17625.1,GB17743					
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN61547 light industry level (surge 2KV), criteria A					
OTHERS	MTBF	260.6K hrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	123.5*81.5*23mm (L*W*H)					
	PACKING	0.24Kg ; 54pcs/15Kg/1.12CUFT					

NOTE

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf parallel capacitor.
3. Please see "DIP switch table".
4. Derating may be needed under low input voltage. Please check the static characteristics for more details.
5. Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time.
6. Efficiency is measured at 900mA/67V output set by DIP switch.
7. To fulfill requirements of the latest ErP regulation for lighting fixtures, this LED power supply can only be used behind a switch without permanently connected to the mains.
8. The power supply is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.

Wireless
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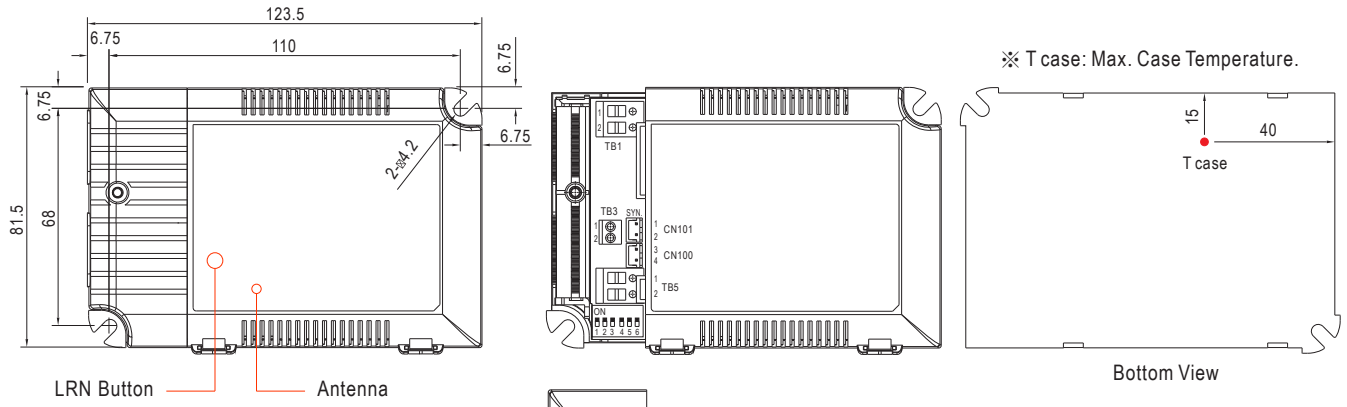
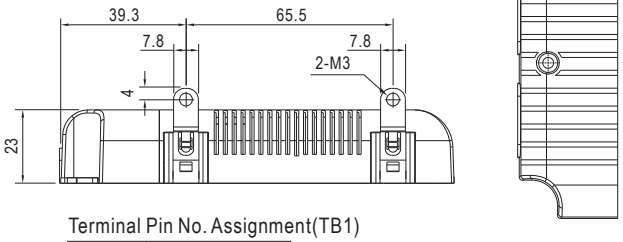
■ Mechanical Specification

Case No.LCM-60A Unit:mm



※ T case: Max. Case Temperature.



Terminal Pin No. Assignment(TB1)

Pin No.	Assignment
1	AC/L
2	AC/N

Terminal Pin No. Assignment(TB3)

Pin No.	Assignment
1	+NTC
2	-NTC

Terminal Pin No. Assignment(TB5)

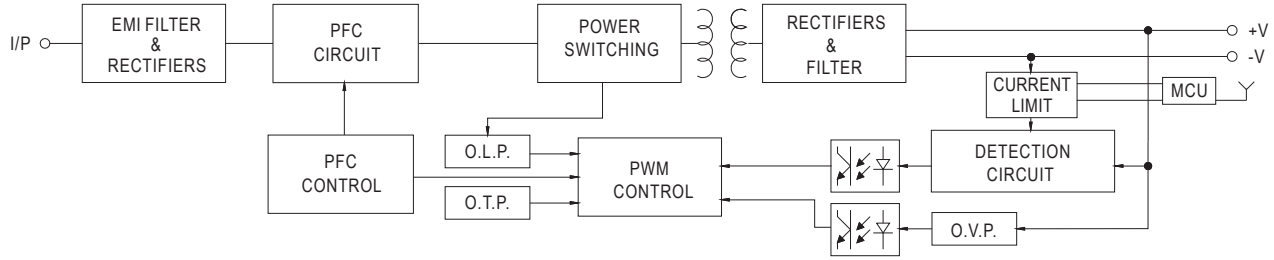
Pin No.	Assignment
1	+Vo
2	-Vo

SYN. or DC 0-10V Dimming
Connector(CN101/CN100):JST B2B-XH or equivalent

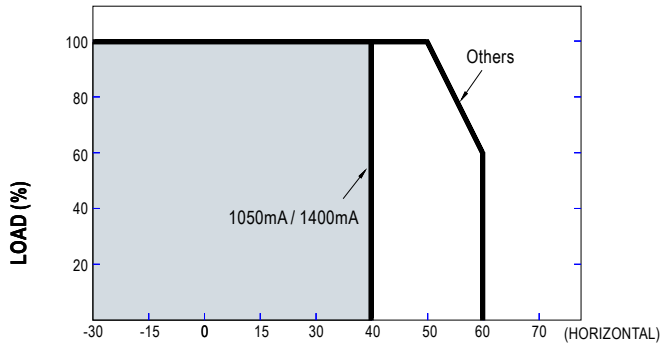
Pin No.	Assignment	Mating Housing	Terminal
1,3	+	JST XHP or equivalent	JST SXH-001T-P0.6 or equivalent
2,4	–		

■ Block Diagram

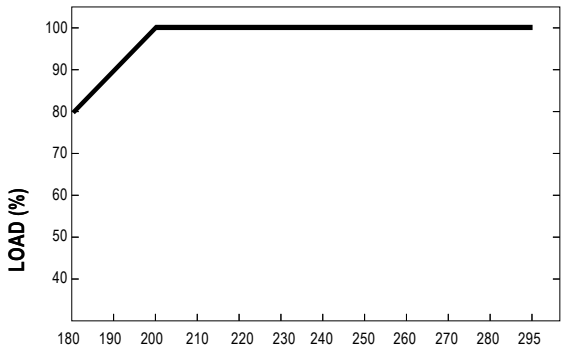
PFC fosc : 60KHz
PWM fosc : 80KHz



■ Derating Curve



■ Static Characteristics



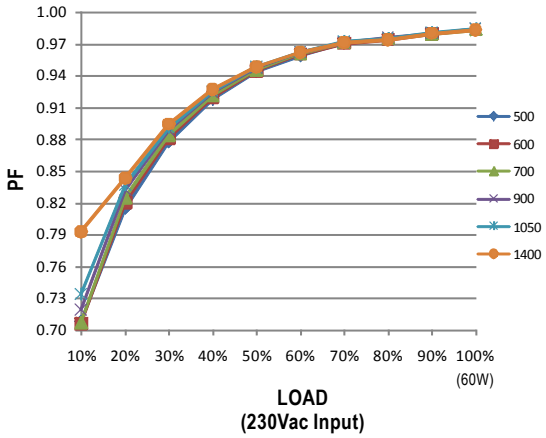
■ DIP Switch Table

LCM-60EO is a multiple-stage output current supply, selection of output current through DIP switch as table below.

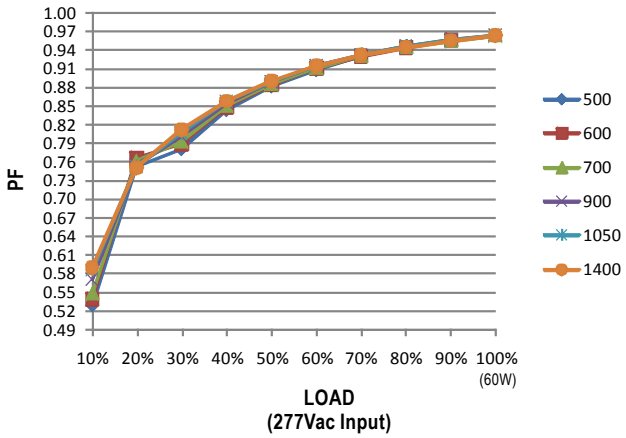
DIP S.W. / Io	1	2	3	4	5	6
500mA	----	----	----	----	----	----
600mA	ON	----	----	----	----	----
700mA(Factory Setting)	ON	ON	----	----	----	----
900mA	ON	ON	ON	----	----	ON
1050mA	ON	ON	ON	ON	----	ON
1400mA	ON	ON	ON	ON	ON	ON

■ Power Factor Characteristic

Constant Current Mode

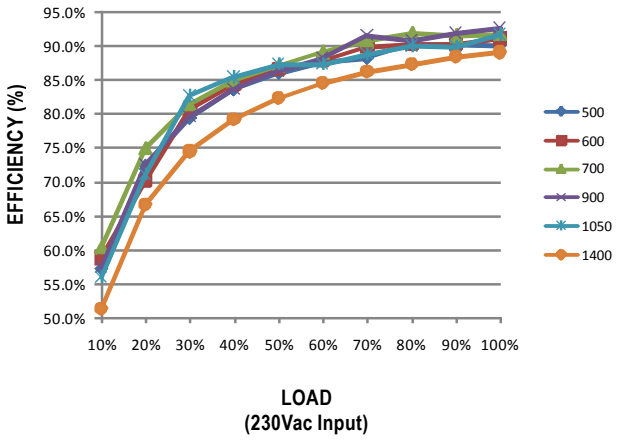


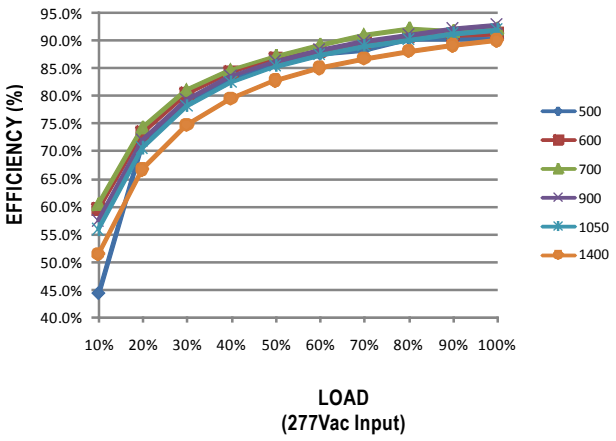
Constant Current Mode



■ EFFICIENCY vs LOAD

LCM-60EO series possess superior working efficiency that up to 92% can be reached in field applications.





■ Interoperable products / EnOcean Equipment Profile(EEP)

Support Equipmenrt	Telegram
Rocker Pad Switch	F6-02-02
Occupancy Sensor	A5-07-01
Occupancy Sensor	A5-07-02
Occupancy Sensor	A5-07-03
Light Level Sensor	A5-06-02
Light Level Sensor	A5-06-03
Central Controller	A5-38-08
Demand Response	A5-37-01

■ Batteryless wireless switch supplier

MW order code:WPD-06SWT. There are many other switch supplier listed in the below.

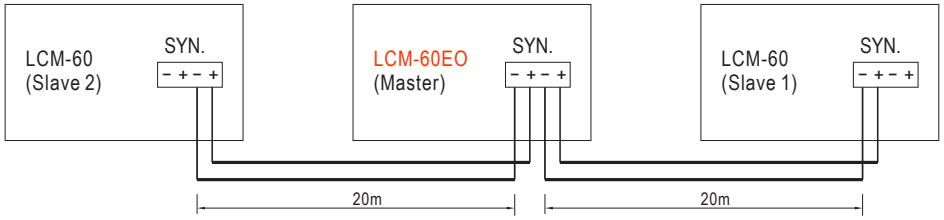
WPD-06SWT

Manufacturer	Model*
Legrand	0 784 42
Siemens	5WG4222-3AB10
Berker	24121009
Jung	ENO A 595
Busch-jaeger	EASYSENS/ ENOCEAN
Gira	2422 03
Peha	D 455/61.022 FU-BLS N
Eltako	F4T65
VIMAR	20505+20506.B+21507.B

*: The model list is provided for reference. For more information please contact original supplier

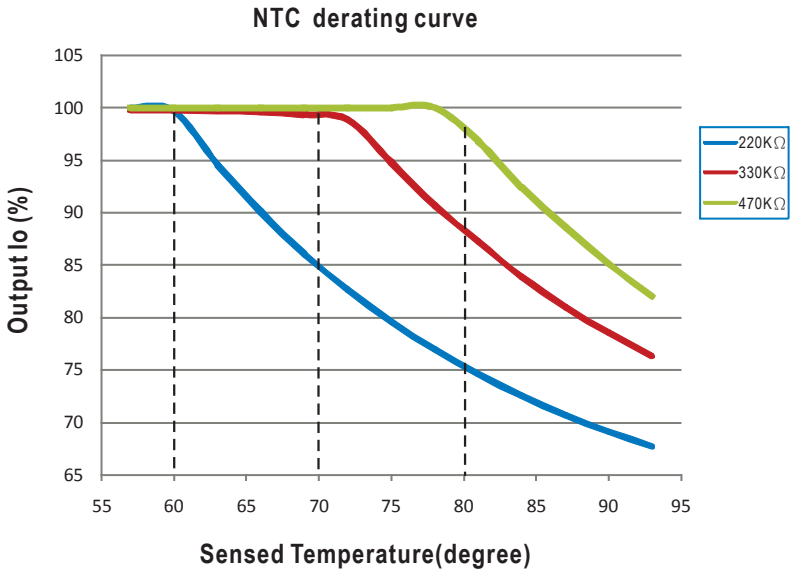
■ SYNCHRONIZATION OPERATION

- 10 drivers(max.) synchronization (1 master + 9 slaves)
- Maximum cable length between each units : 20 meter.



NOTE: Please make sure all units are set to 100% dimming setting(factory default) before synchronizing.
Salve model could be LCM-60EO or LCM-60(economy).

■ TEMPERATURE COMPENSATION OPERATION



LCM-60EO have the built-in temperature compensation function (T ↑ ,Io ↓). By connecting a temperature sensor (NTC resistor) between the NTC +/- terminal of LCM-60EO and the detecting point on the lighting system or the surrounding environment, output current of LCM-40EO could be correspondingly changed to ensure the long life of LED.

1.LCM-60EO can still be operated well when the NTC resistor is not connected and the value of output current will be the current level that you set through the DIP switch.

2.

NTC resistance	Output Current
220K	< 60℃, 100% of the rated current (corresponds to the setting current level) > 60℃, output current begin to reduce, details please refer to the curve.
330K	< 70℃, 100% of the rated current (corresponds to the setting current level) > 70℃, output current begin to reduce, details please refer to the curve.
470K	< 80℃, 100% of the rated current (corresponds to the setting current level) > 80℃, output current begin to reduce, details please refer to the curve.

Notes: 1. MW does not offer the NTC resistor and all the data above are measured by using THINKING TTC03 series.
2. If other brands of NTC resistor is applied,please check the temperature curve first.
3. Synchronization function of the power supply will be invalid when the "temperature compensation" function is in use.

■ LRN button description

LRN (Learn) Button:
Shortly press (around 2 second) the button to enter linking (pairing) / unlinking mode.
The LED lamp connected at the output of LCM starts toggling between 10% and 90% indicating that linking mode is active. Once activated, this mode stays temporary active to provide time to link or unlink multiple switches. The mode will stop and back to normal mode after 30 seconds if no wireless telegram from switch is received.

For the switch to be linked, click the “I” button (top button marked on the switch plastic or “I” symbol on the back of the switch 4 times quickly. In case the output of LCM is continuous 100% for 4 seconds, it mean the switch is linked successfully.

LCM-40/60EO is now ready to accept new links on another switch.

In case a linked switch to be unlinked, please use the same action as described from the linking method above.

To exit linking / unlinking mode and return to normal operation, wait 30s without doing anything or shortly press the button again.

In order to clear all linked switches and reset the LCM-40/60EO to factory settings, please press and hold the button for 10 seconds.

■ Installation & Pairing

Hareware connection:

1. Connect the LED lamp to the driver.
2. Connect the driver to the AC mains.

There are two approaches for linking(pairing):

1. Using the LRN button on the driver

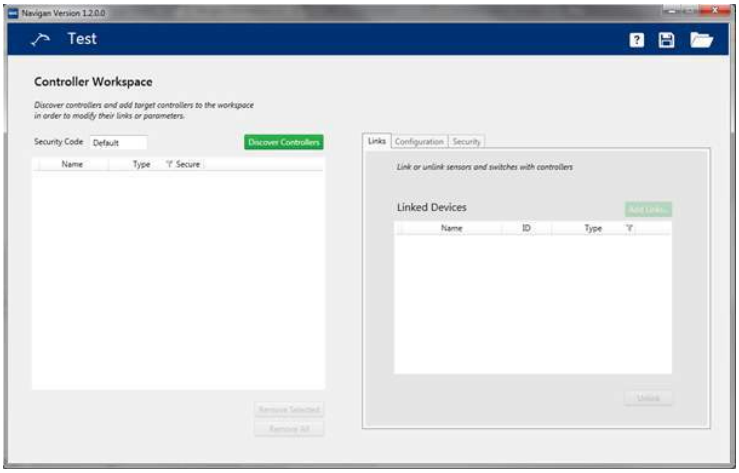
The instruction is in the LRN button description.

2. Using the NAVIGAN wireless software

Benefit to use NAVIGAN is more dimming parameters can be configured .

The software can be download in the website link below.
http://www.navigan.com/
After the software installation, insert the USB300 into one of USB port from the computer.

For more details, please check the manual.



■ World Coverage Map

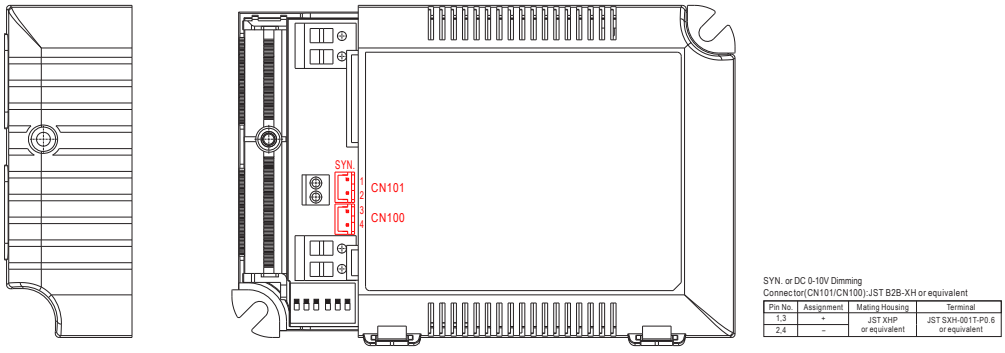
COUNTRY/REGION	STANDARD	FREQUENCY
Aruba	Possibly R&TTE Directive	868 MHz – Confirm with test house
Australia / New Zealand	N.A.	
Barbados	N.A.	Note1
Bermuda	N.A.	Note1
Bolivia	N.A.	Note1
Brazil	ANATEL	868 MHz
British Virgin Islands	N.A.	Note1
Cayman Islands	Possibly R&TTE Directive	868 MHz
CEPT (European regional)*	EN 300 220	868 MHz
Chile	Possibly R&TTE Directive	868 MHz
China	CNAS/MIIT EN 300 220	868 MHz
Colombia	Possibly ANATEL	868 MHz
Ecuador	N.A.	Note1
El Salvador	Possibly R&TTE Directive	868 MHz
French Guiana	ETSI EN 300 220	868 MHz
Guatemala	N.A.	Note1
Hong Kong	Possibly 315MHz	Note1
India	Possibly 315MHz	Note1
Israel	Possibly 315MHz	Note1
Jamaica	N.A.	Note1
Japan 920**	ARIB STD-T108	928MHz
Malaysia	SKMM WTS SRD/EN 300 220	868 MHz
Mexico	We believe Mexico does not accept FCC	868 MHz
Nicaragua	N.A.	Note1
Peru	N.A.	Note1
Panama	FCC CFR47 Part 15.249	902 MHz
Russia	N.A.	
Singapore	TS SRD/EN 300 220	868 MHz
South Africa	ICASA/EN 300 220	868 MHz
South Korea	N.A.	
Suriname	N.A.	Note1
Taiwan	Possibly 315MHz	Note1
Trinidad & Tabago	N.A.	Note1
Turks & Caicos Islands	Possibly R&TTE Directive	868 MHz
UAE	EN 300 220	868 MHz
Uruguay	N.A.	Note1
USA/Canada	FCC CFR47 Part 15.249	315MHz, 902 MHz

Note1: It is suggested to check with local accredited certification agency.

*CEPT is the European regional organization dealing with postal and telecommunications issues and presently has 45 Members: Albania, Andorra, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, San Marino, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, The former Yugoslav Republic of Macedonia, Turkey, Ukraine, United Kingdom, and Vatican.

**In February 2012, Japanese regulatory body ARIB (Association of Radio Industries and Businesses) released new 920 MHz frequency band for radio equipment, due to LTE rollout. The 950 MHz frequency band will be obsolete by end of 2015.

■ 3 in 1 DIMMING OPERATION



※ Built-in 3 in 1 dimming function, output constant current level can be adjusted through output terminal by connecting a resistance or 0 ~ 10Vdc or 10V PWM signal between SYN+ and SYN-.

※ Please DO NOT connect "SYN-" to "-Vo".

※ Reference resistance value for output current adjustment (Typical)

Resistance value													
	Single driver	Short	10KΩ	20KΩ	30KΩ	40KΩ	50KΩ	60KΩ	70KΩ	80KΩ	90KΩ	100KΩ	OPEN
	Multiple drivers (N=driver quantity for synchronized dimming operation)	Short	10KΩ/N	20KΩ/N	30KΩ/N	40KΩ/N	50KΩ/N	60KΩ/N	70KΩ/N	80KΩ/N	90KΩ/N	100KΩ/N	-----
Percentage of rated current		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	100%~108%

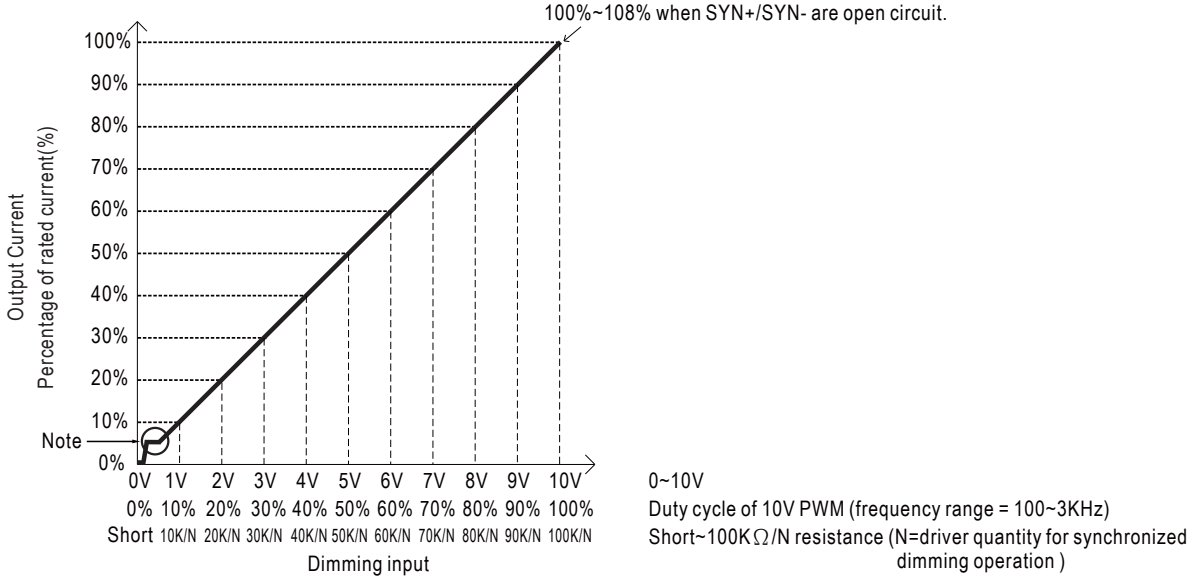
※ 0 ~ 10V dimming function for output current adjustment (Typical)

Dimming value	0V	1V	2V	3V	4V	5V	6V	7V	8V	9V	10V	OPEN
Output current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	100%~108%

※ 10V PWM signal for output current adjustment (Typical): Frequency range :100Hz ~ 3KHz

Duty value	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
Output current	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	100%~108%

◎ Dimming Characteristic



※ Note : 1. Min. dimming level is about 6%
2. The output current is not defined when 0%<Iout<6%
3. The output current could drop down to 0% when dimming input is about 0KΩ or 0Vdc, or 10V PWM signal with 0% duty cycle