General Description

The IN5L001 and the related application circuit (patented) is a high power efficiency (>80%) and high power-factor (>0.85) based on flyback or buck topology, which is suitable for LED lamp driver.

The IN5L001 and the related circuit is also built-in with several functions, protection and EMI-improved solution in a tiny package. It takes less components counts or circuit space, especially ideal for those total solutions of low cost.

It features a transconductance voltage amplifier for feedback error processing, a simple current reference generator for generating a current command proportional to the input voltage, which need to cooperate with application circuit.

These implemented functions include low startup current (<20uA),leading-edge blanking of the current sensing and internal slope compensation and jittering function for EMI-improved solution. It also features more protections like OLP (Over Load Protection), OVP (Over Voltage Protection) and on-chip over-temperature Protection (OTP, shuts down the switching when the chip temperature exceeds 150oC) to prevent circuit damage occurred under abnormal conditions .

Application

- E27, PAR30, Offline LED Lights

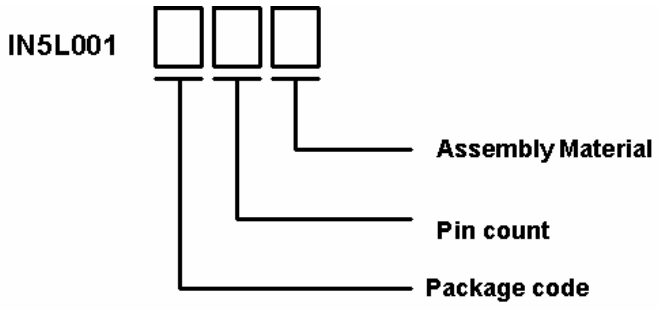
Feature

- 90V to 270VAC wide input range
- High power efficiency : up to 80% and high power factor : >0.8 with low BOM cost.
- Transition Mode Controller for Low Implementation Cost of AC Input LED Lighting Applications
- High voltage CMOS process with excellent ESD protection
- Soft Start Function
- Very low startup current (<20uA)
- UVLO (Under voltage lockout) 9/15V
- OVP (Over Voltage Protection)
- OLP (Over load protection)
- OTP (Over temperature protection)
- Opto coupler short protection and Feedback open protection

Ordering Information

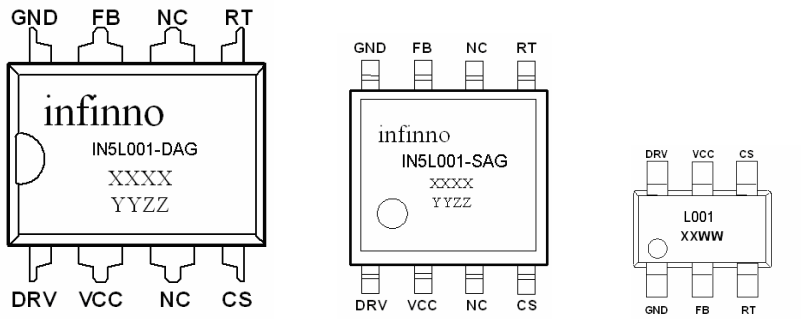
Part Number	Package	Packaging	Note
IN5L001-T6G	SOT-23-6	Tube/Carton	Green -30~85C
IN5L001-SAG	SOP-8	Tube or Tape & Reel	
IN5L001-DAG	DIP-8	Tube	

Note: Infinno lead-free products contain molding compounds/die attach materials and 100% matte tin plate termination finish; which are fully compliant with RoHS. Infinno lead-free products meet or exceed the lead-free requirements of IPC/JEDEC J-STD-020C for MSL classification at lead-free peak reflow temperature. Infinno defines “Green” to mean lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).



※Package code
D: DIP, Q: QFN ; S : SOP, M: MSOP, R: TSSOP;
※Pin count
6=6PIN , A=8PIN
※Assembly Material
G : Halogen & Lead Free Device
※Production series number
X : Run code
Y : Date code
Z : Plant code

Pin connection (Top View)



Pin Assignments and Package Type

Pin	Designation	Description
1	GND	Ground
2	FB	Voltage input pin by connecting a photo-coupler
3	VS	Voltage Sence
4	IS	Current Sense
5	Vcc	Power supply pin
6	Out	Driver output to driver the external MOSFET

Absolute Maximum Ratings

Parameter Symbol		Symbol	Limit Values		Unit	Remarks
			Min.	Max		
Supply Voltage Vcc		V_{CC}	-0.3	30	V	
IS, VS		V_{IS} V_{in}	-0.3	7	V	
Gate Driver Voltage		V_{out}	-0.3	V_{CC}+0.3	V	
Gate Output Current		I_{out}		500	mA	
Junction Temperature		Tj	-40	85	℃	
Operation Ambient Temperature		Topr	-40	85	℃	
Storage Temperature		Tstg	-40	85	℃	
Package Thermal Resistance	SOT-26	θJA	-	250	℃/W	
Power Dissipation @T_A=85℃	SOT-26	P_D	-	0.25	W	
Lead temperature (Soldering, 10 sec)			-	260	℃	
ESD Voltage Protection	HBM	$V_{ESD-HBM}$	-	3.0	KV	
	MM	V_{ESD-MM}	-	300	V	

Stress beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliablity.

Recommended Operating Conditions

Parameter Symbol	Symbol	Limit Values		Unit	Remarks
		Min.	Max		
Supply Voltage Vcc	V_{CC}	10	25	V	
Startup Resistor Value	R_{star}	1.2	4.4	MΩ	
Junction temperature range	Tj	-40	150	℃	
Ambient temperature range	Topr	-40	85	℃	

DC Electrical Characteristics (V_{CC} =12V, Ta=25)

Supply Voltage (V_{CC} Pin)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Startup Current	I_{CC-ST}		12	20	μA	
Operating Current (with 1nF load on DRV pin)	I_{CC-OP}		2.6		mA	VFB=3V
			0.4		mA	Protection tripped (OVP/OLP)
UVLO (off)	$V_{UVLO-OFF}$	8	9	10	V	
UVLO (on)	$V_{UVLO-ON}$	14	15	16	V	
V_{CC} OVP Level	V_{OVP}	24.8	26	27.2	V	

Voltage Feedback (FB Pin)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Short Circuit Current	I_{Zero}		1.3	2.2	mA	V_{IN}=0V
Open Loop Voltage	V_{IN-OP}		5.2		V	FB pin open

Current Sensing (IS Pin)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Maximum Input Voltage Threshold	V_{IS-th}	0.8	0.85	0.9	V	Internal slope compensation
Leading Edge Blanking Time	T_{LEB}	--	250		ns	
Propagation Delay to Output	T_{PD}	--	100	--	ns	

Oscillator for Switching Frequency

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Frequency	f_{OSC}	62	67	72	kHz	
Maximum Duty Cycle	D_{MAX}	--	75	--	%	Fs=67kHz
Frequency v.s Temp. Stability	f_{DV}	--	--	5	%	(-40℃ ~85℃)
Frequency v.s Voltage Stability	f_{DV}	--	--	1	%	(VCC=11V-25V)
Soft start time	Tsoft	--	7	--	ms	F_S = 67kHz, VFB=3V

Gate Drive Output (OUT Pin)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Output Low Level	V_{OUT_L}	--	--	1	V	V_{CC} = 15V, I_O= 20mA
Output High Level	V_{OUT_H}	8	--	--	V	V_{CC} = 15V, I_O= 20mA
Rising Time	T_R	--	170	350	ns	V_{CC} = 15V, C_L= 1nF
Falling Time	T_F	--	50	100	ns	V_{CC} = 15V, C_L= 1nF

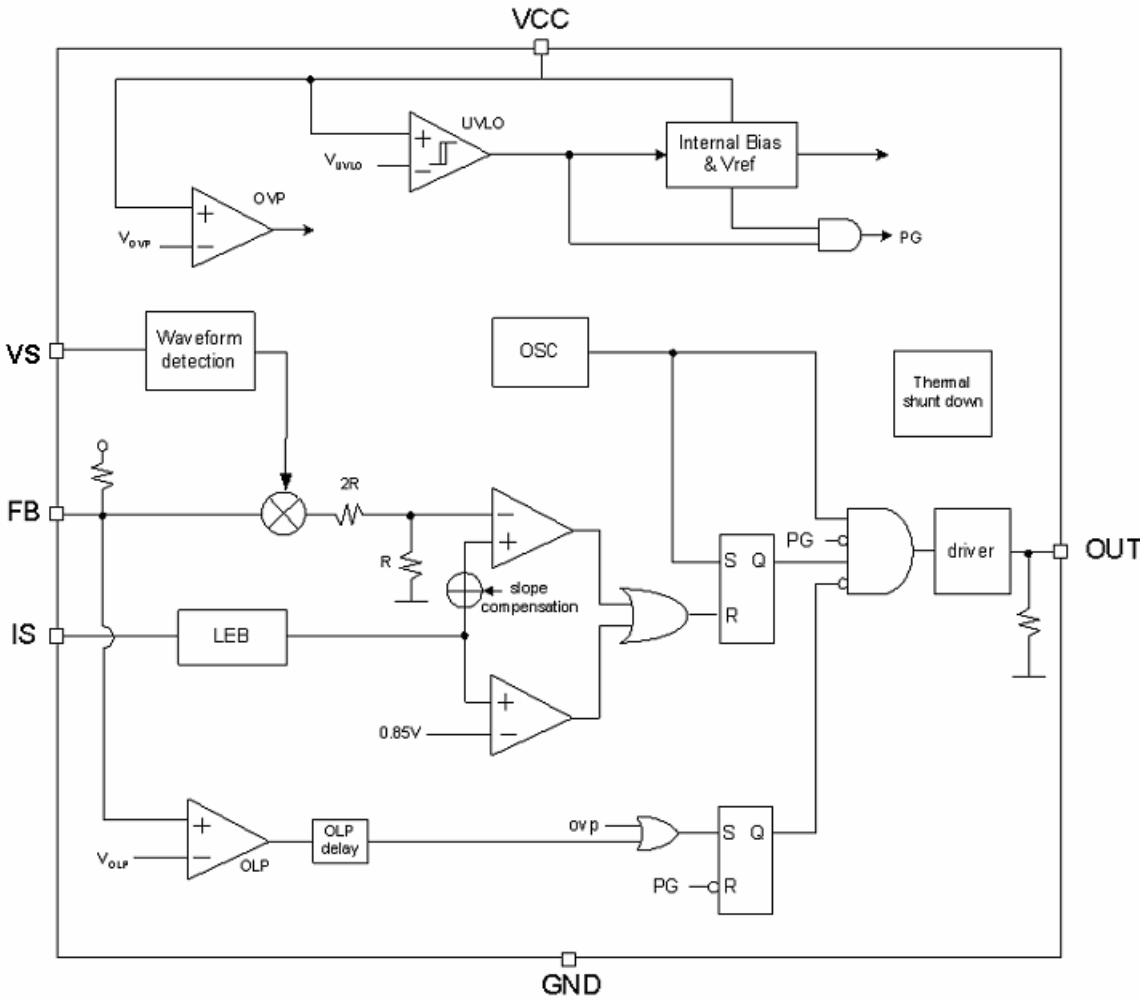
OLP (Over Load Protection)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
OLP Trip Level	V_{OLP}	--	4.5	--	V	
OLP Delay Time	T_{OLP}	--	45	--	ms	F_S = 67kHz

Thermal shunt down

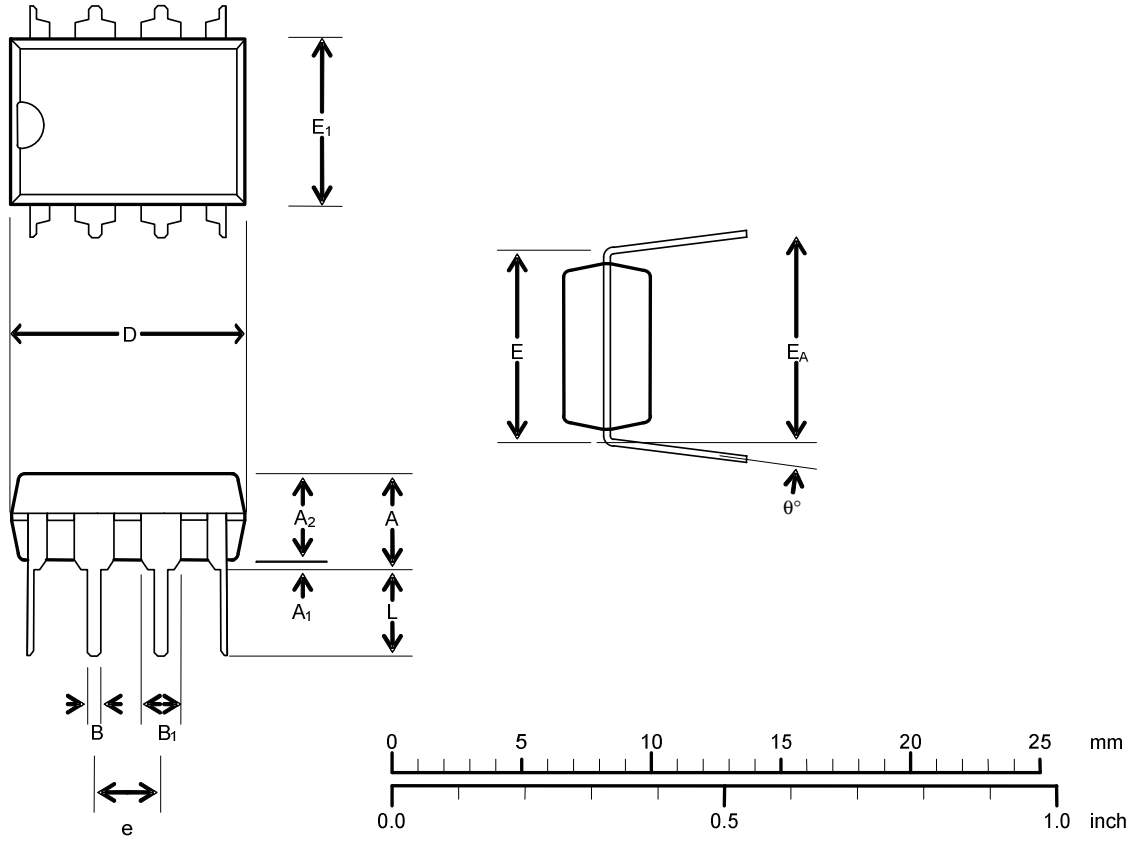
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Thermal shunt down		--	150	--	℃	
Thermal shunt down hysteresis		--	20	--	℃	

Block Diagram



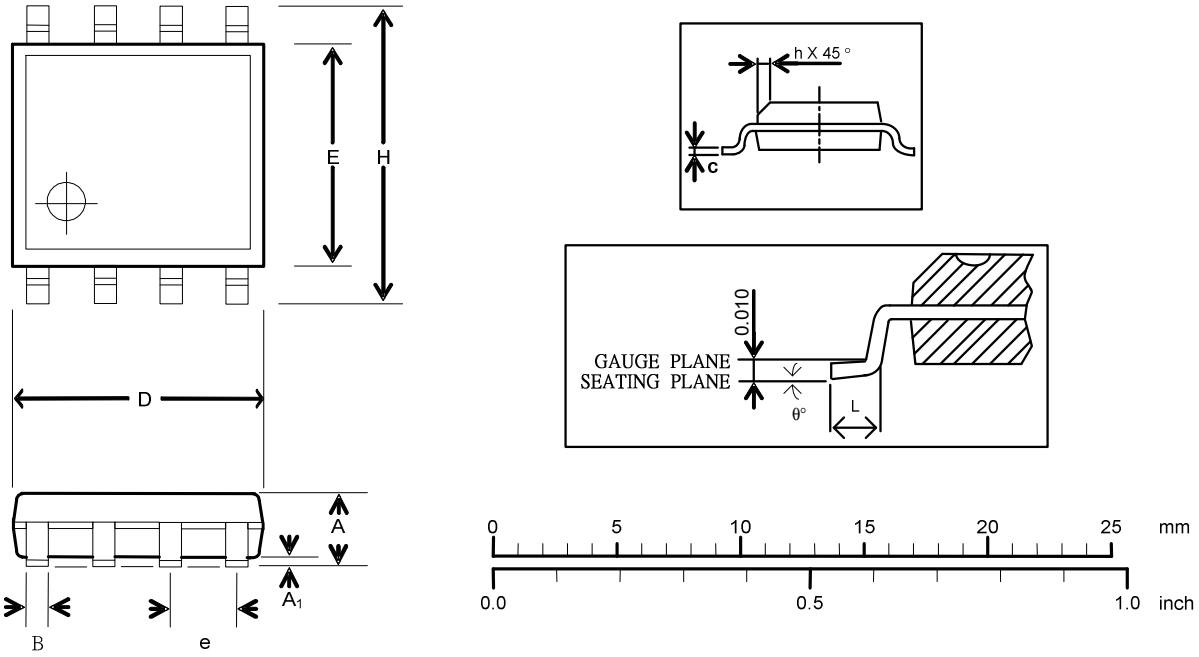
Package Information

DIP-8



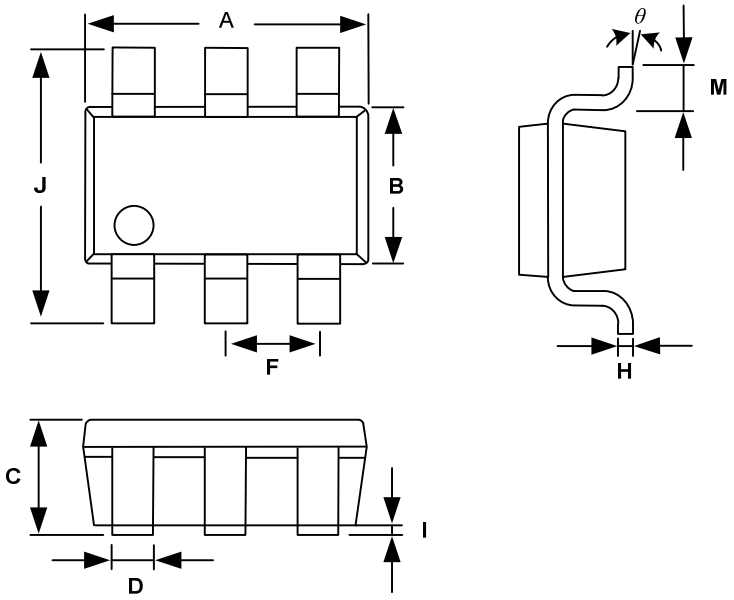
Symbol	Dimension in mm		Dimension in inch	
A	5.334	(MAX)	0.210	(MAX)
A_1	0.381	(MIN)	0.015	(MIN)
A_2	3.302	±0.127	0.130	±0.005
B	0.457	(TYP)	0.018	(TYP)
B_1	1.524	(TYP)	0.060	(TYP)
D	9.271	± 0.200	0.365	± 0.035
E	7.620	(TYP)	0.300	(TYP)
E_1	6.401	± 0.203	0.252	±0.008
e	2.540	(TYP)	0.100	(TYP)
E_A	9.017	± 0.508	0.355	± 0.020
L	3.302	± 0.508	0.130	±0.020
θ°	0°~ 15°		0°~ 15°	

SOP-8



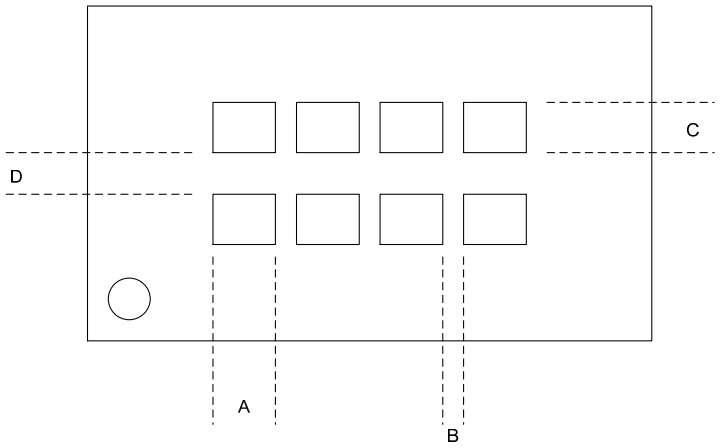
Symbol	Dimension in mm		Dimension in inch	
	MIN.	MAX.	MIN.	MAX.
A	1.35	1.75	0.05	0.07
A_1	0.10	0.25	0.00	0.01
B	0.41	(TYP)	0.02	(TYP)
C	0.20	(TYP)	0.01	(TYP)
e	1.27	(TYP)	0.05	(TYP)
D	4.80	5.00	0.19	0.20
H	5.80	6.20	0.23	0.22
E	3.80	4.00	0.15	0.16
L	0.40	1.27	0.02	0.05
h	0.25	0.50	0.01	0.02
θ°	0°~ 8°		0°~ 8°	

SOT-23-6



Symbol	Dimension in mm		Dimension in inch	
	MIN.	MAX.	MIN.	MAX.
A	2.692	3.099	0.106	0.122
B	1.397	1.803	0.055	0.071
C	------	1.450	------	0.057
D	0.300	0.550	0.012	0.022
F	0.838	1.041	0.033	0.041
H	0.080	0.254	0.003	0.010
I	0.050	0.150	0.002	0.006
J	2.600	3.000	0.102	0.118
M	0.300	0.600	0.012	0.024
θ	0°	10°	0°	10°

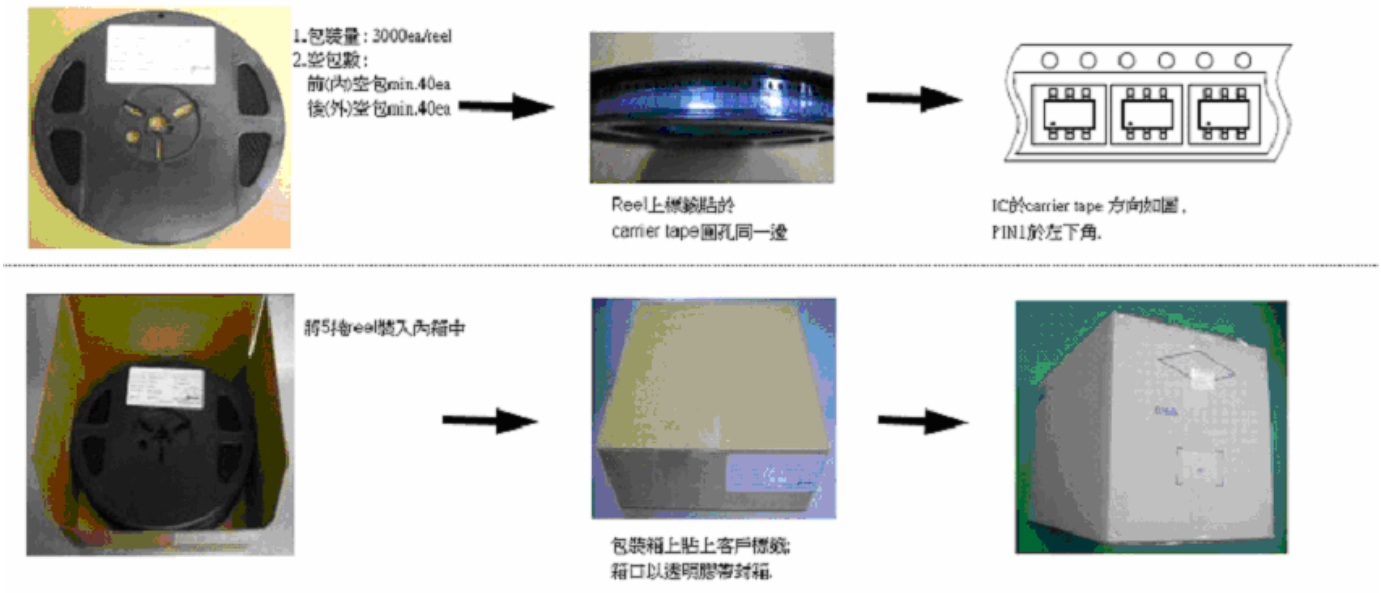
Body Marking



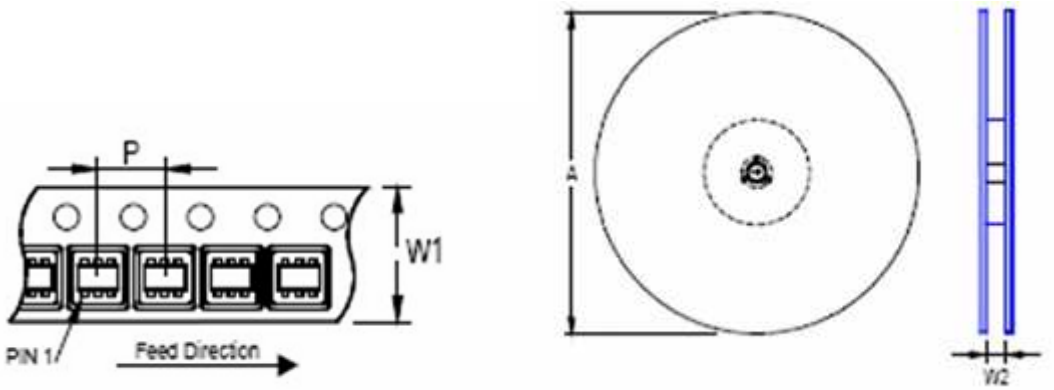
Package Type	A	B	C	D
SOT-26	0.3 mm	0.1 mm	0.35 mm	0.2 mm

Line #	Mark Number	Contents
Line 1 :	1 thru 4	Name : F001
Line 2 :	1 thru 4	Date code : 1020

Shipping packing

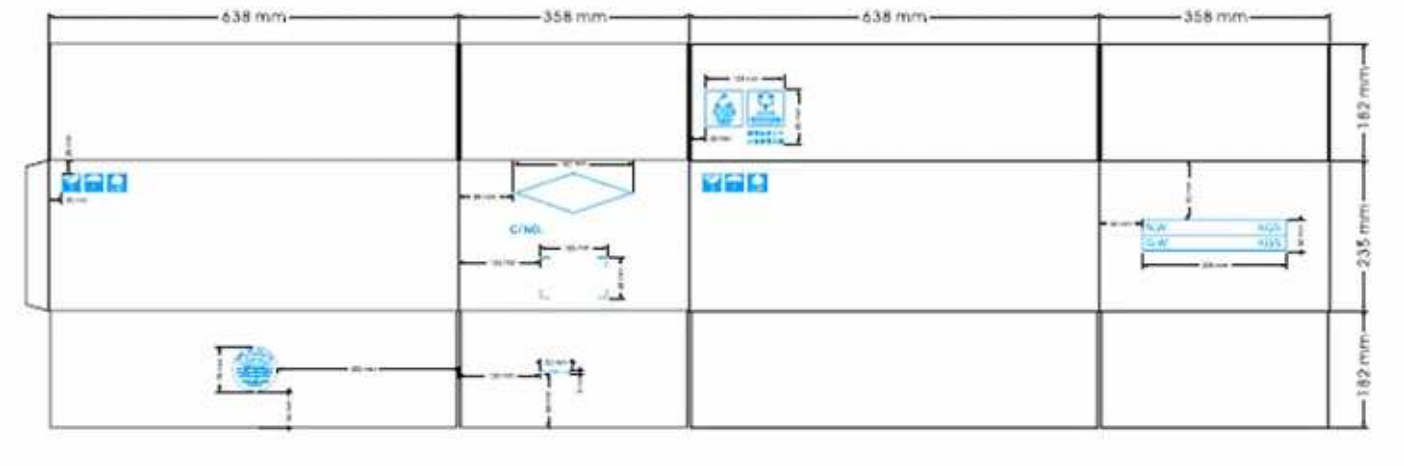


Tape Reel Data



Package Type SOT-26	Tape Size (W1) (mm)	Pocket Pitch (P) (mm)	Reel Size (A) (mm)	Reel Width (W2) Min./Max. (mm)	Units Per Reel pcs.
6 Lead	8	4	180	8.4/9.9	3000

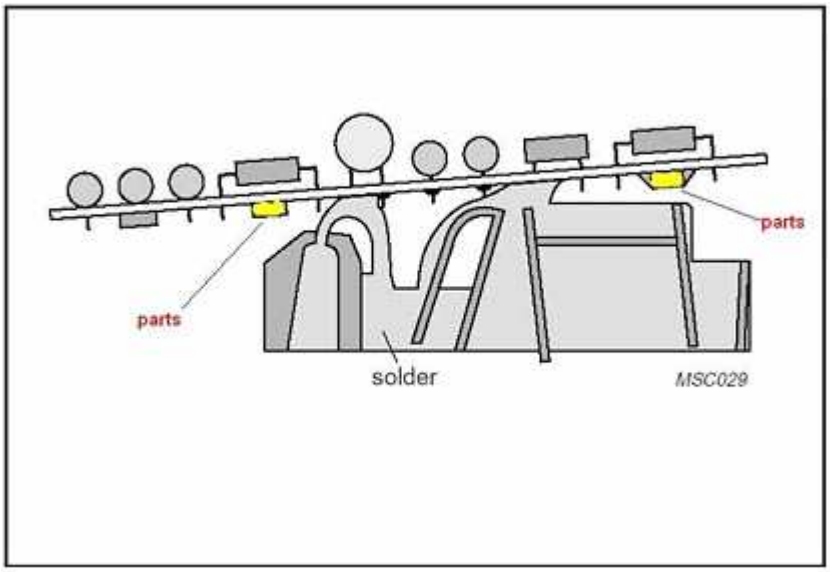
Carton Data



NOTE

1.紙箱尺寸：L 638 X W358 X H235mm
2.尺寸公差：± 5mm
3.紙箱材質：面紙白紙 240
瓦紙B浪 100
中紙 175
瓦紙A浪 180
底紙A級 200
4.破裂強度：250LBS± 10LBS
5.印刷顏色：天空藍.
6.備 註：紙箱打釘.

Wave soldering process



Wave soldering profile

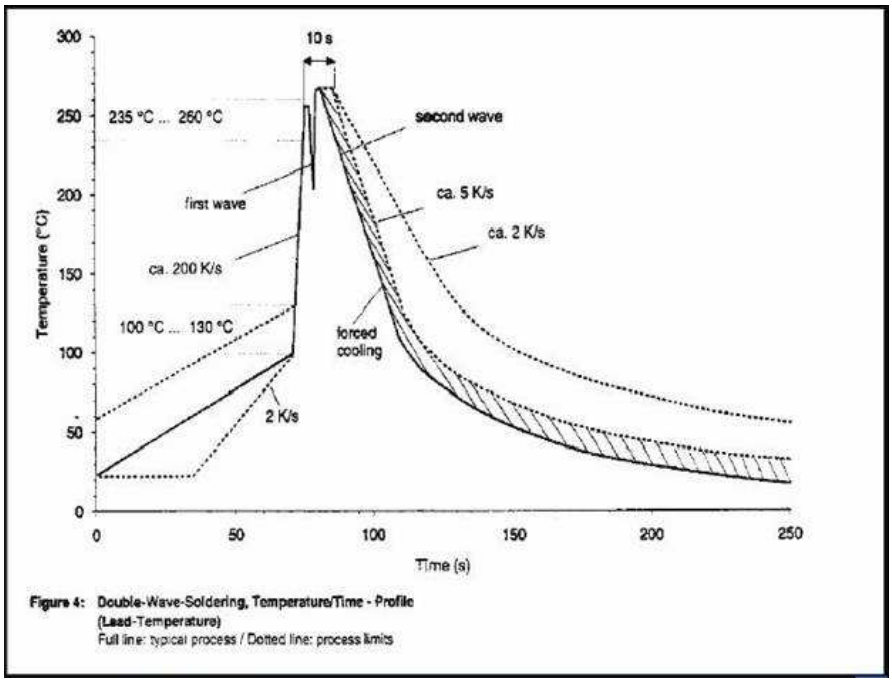
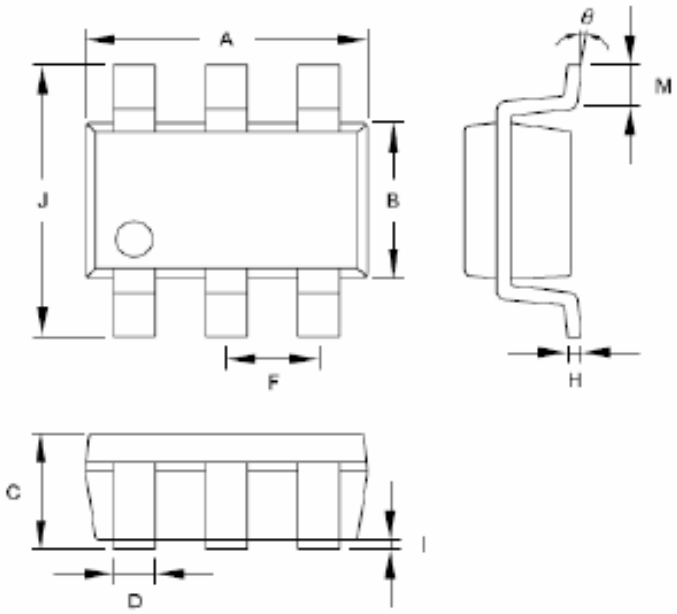


Figure 4: Double-Wave-Soldering, Temperature/Time - Profile (Lead-Temperature)
Full line: typical process / Dotted line: process limits

Package Information

SOT-26



Symbol	Dimension in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.692	3.099	0.106	0.122
B	1.397	1.803	0.055	0.071
C	-------	1.450	-------	0.058
D	0.300	0.550	0.012	0.022
F	0.838	1.041	0.033	0.041
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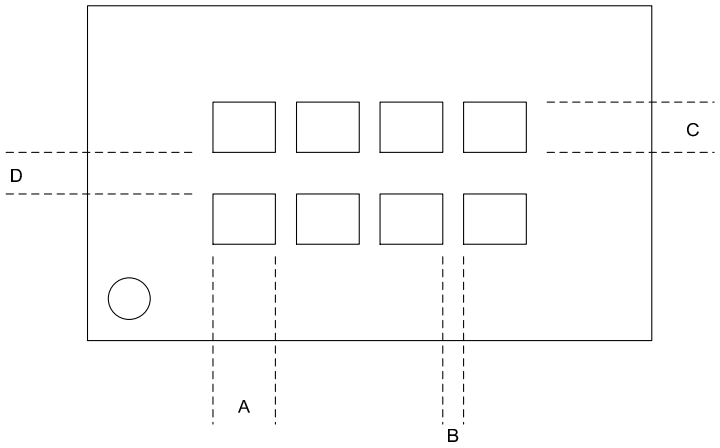
I	0.050	0.150	0.002	0.006
J	2.600	3.000	0.102	0.118
M	0.300	0.600	0.012	0.024
θ	0	10°	0	10°

Body Marking



Package Type	A	B	C	D
SOT-26	0.3 mm	0.1 mm	0.35 mm	0.2 mm

Line #	Mark Number	Contents
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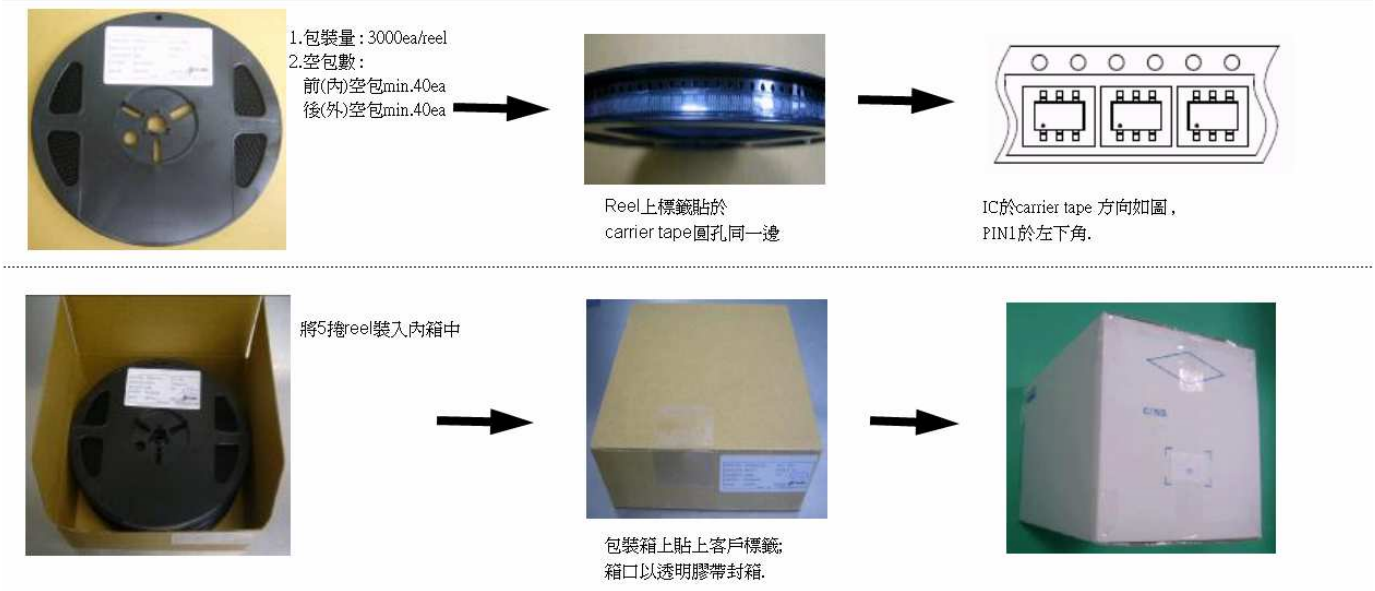
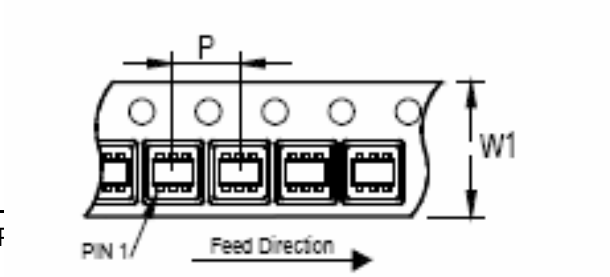
Line 2 :	1 thru 4	Date code : 1020

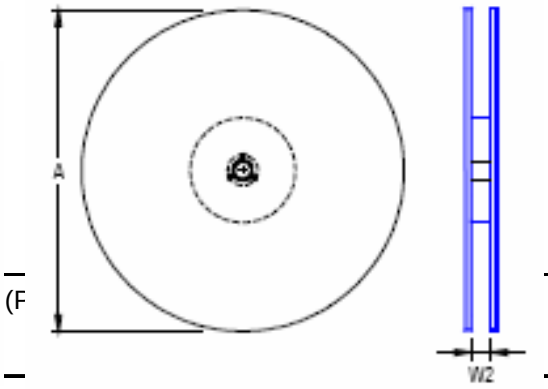
Shipping packing



Packing information

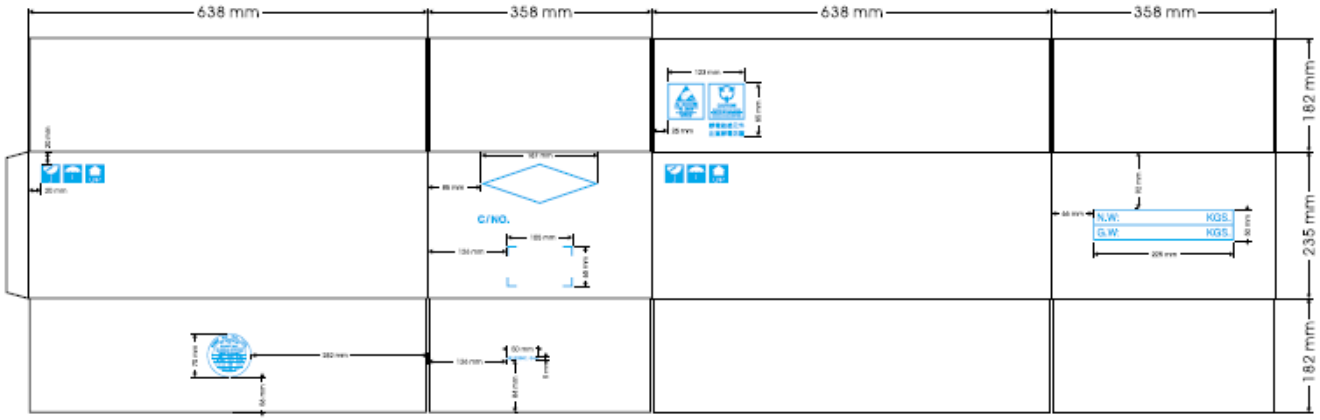
Tape Reel Data





				Units Per Reel pcs.
6 Lead	8	4		3000

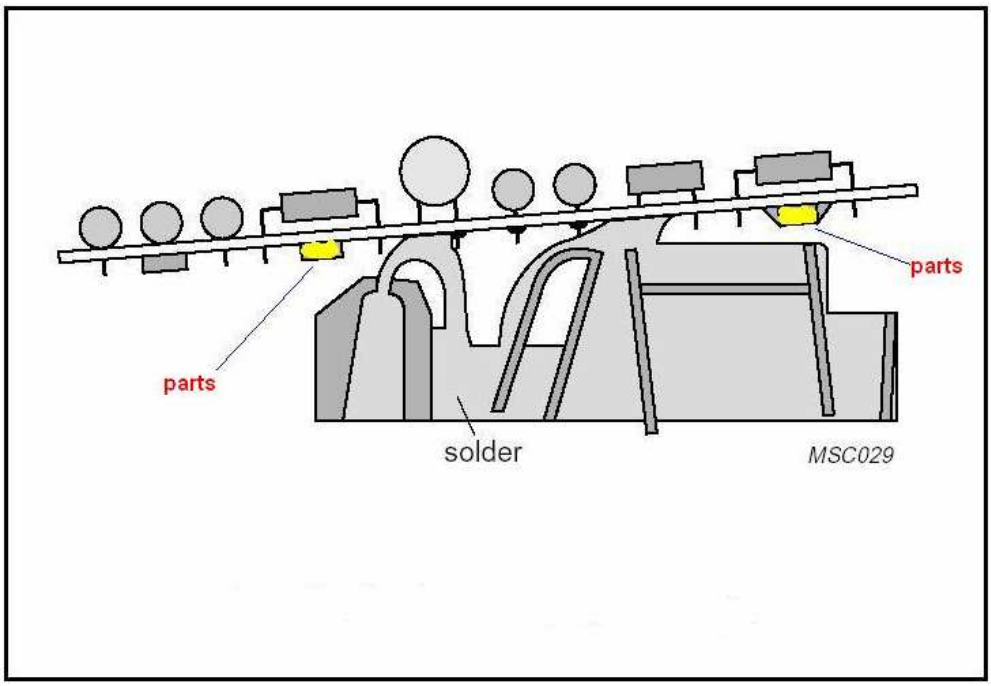
Carton Data



NOTE

1.紙箱尺寸：L 638 X W358 X H235mm
2.尺寸公差：± 5mm
3.紙箱材質：面紙白紙 240
蔻紙B浪 100
中紙 175
蔻紙A浪 180
底紙A級 200
4.破裂強度：250LBS± 10LBS
5.印刷顏色：天空藍.
6.備 註：紙箱打釘.

Wave soldering process



Wave soldering profile

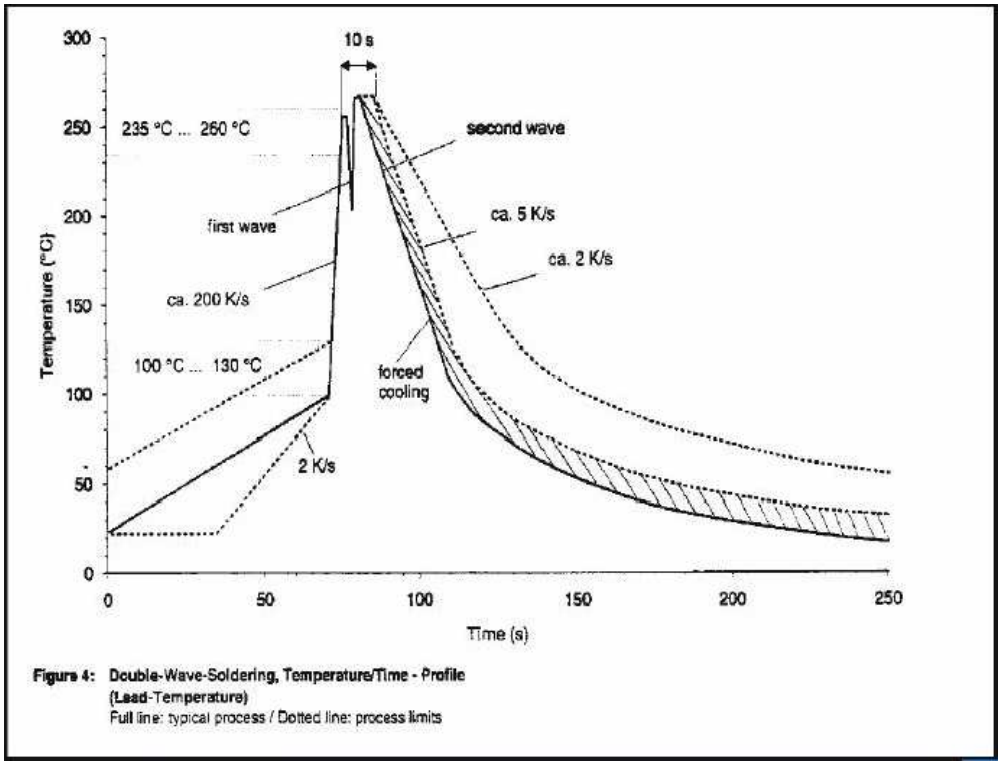


Figure 4: Double-Wave-Soldering, Temperature/Time - Profile (Lead-Temperature)
Full line: typical process / Dotted line: process limits

Reference Design I (AN9L062, Isolated Power)

General Description

AN9L062 is high power efficiency and high power factor isolated LED power module , which topology is used by panted smart power module.

Constant current driver mode for steady power supply

High efficiency for energy saving, more efficient than Incandescent and Halogen lamps

It is suitable for all E27 interior lighting, such as offices, hotels, shopping malls, retails, hospitals and show rooms lighting, etc;

Dimension: L=56mm, W=25mm, H=20mm (customized or E27 space solution)

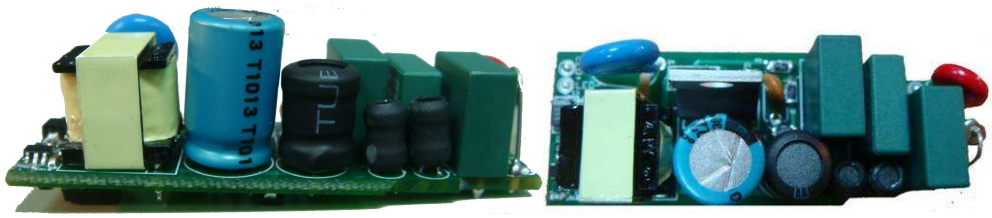


Fig 1-1. PCB Assembly

Schematic

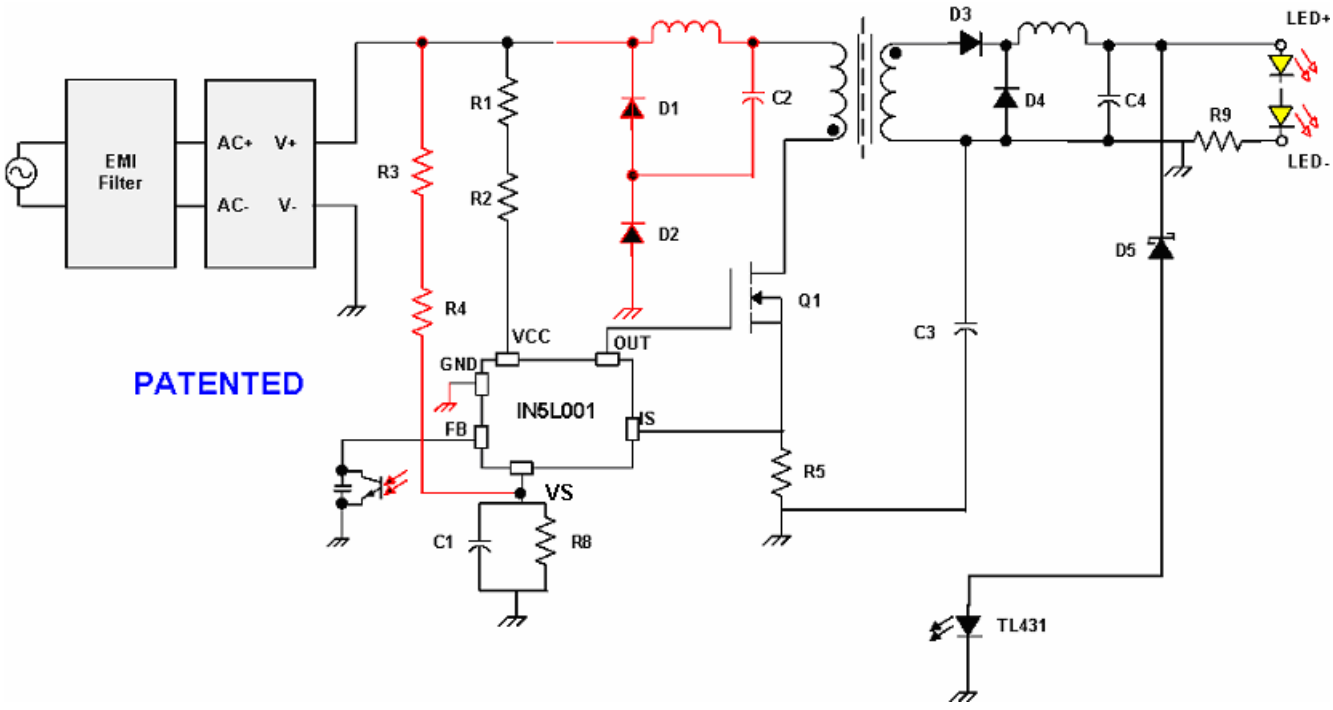


Fig 1-2. Design Schematic

Electrical Characteristics (V_{CC} =12V, Ta=25

Output

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
DC-Voltage	V_{out}		17		V	
Rated current	I_{out}	304	320	336	mA	
Rated power	P_{out}		5.5		W	
Ripple current (max.)	I_{ripple}			100	mA	(p-p)@100VAC/60Hz*
Line regulation	%	-1.5%	-	1.5%	%	Line regulation is measured at full load
Turn on time	T_{on}			1	S	@100VAC and @220VAC

∗Ripple current are measured at 20MHz of bandwidth by using a 15cm twisted pair-wire terminated with no parallel capacitor

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Voltage Range	V_{in}	90		264	Vac	
Frequency Range	f	47		63	Hz	
Efficiency	η	**83/86**			%	@110VAC/ 220VAC
Power factor	PF		**>0.9** **>0.85**			@110VAC/ @220VAC
AC curren	I_{ac}		-	0.14	A	@100VAC
				0.07	A	@220VAC

Proteciton

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Over load	OLP	120			%	Above 120% rated output power Protection type : oveload limit
Short circuit	SCP					Protection type : recover automatically after fault condition removed

Enviroment

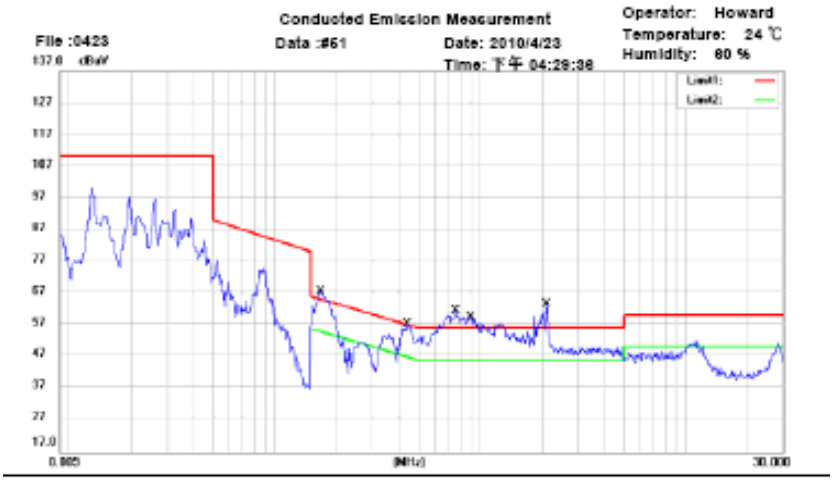
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Working temp.	$T_{operation}$	-20		60	^{o}C	Refer to output load derating curve
Working humidity		20		90	%	RH non-condensing
Storage temp	$T_{stirage}$	-40		85	^{o}C	
Storage .,humidity		10		95	%	
Temp. Coefficient	T_{ef}	0.035		0.035	%/ ^{o}C	0~45 ^{o}C

Table 1-1: Efficiency and Power Factor

Input Voltage (V)	Input Current (mA)	Input Power (W)	Output Voltage (V)	Output Current (mA)	Output Power (W)	Efficiency (%)	PF
90	85.7	7.0	17.1	328.6	5.61	80.07	0.91
100	76.5	7.0	17.1	328.6	5.61	80.47	0.91
110	69.1	7.0	17.1	328.6	5.61	80.59	0.92
120	63.2	7.0	17.1	328.7	5.61	80.65	0.92
130	58.4	7.0	17.1	329.1	5.62	80.84	0.92
140	54.2	6.9	17.1	328.9	5.62	80.82	0.92
150	50.5	7.0	17.1	329.0	5.62	80.68	0.92
160	47.5	7.0	17.1	329.2	5.62	80.53	0.92
170	44.9	7.0	17.1	329.4	5.62	80.35	0.92
180	42.7	7.0	17.1	329.3	5.62	80.00	0.91
190	40.7	7.1	17.1	329.3	5.62	79.71	0.91
200	38.6	7.1	17.1	329.3	5.62	79.44	0.91
210	37.4	7.1	17.1	329.4	5.63	79.23	0.90
220	35.9	7.1	17.1	329.3	5.62	78.99	0.90
230	34.6	7.1	17.1	329.2	5.62	78.74	0.90
240	33.5	7.2	17.1	329.3	5.62	78.44	0.89
250	32.5	7.2	17.1	329.6	5.63	78.15	0.89
264	31.2	7.3	17.1	329.7	5.63	77.64	0.88

EMI (conduction & Radiation)

Compliance to EN55015



Site : Chamber_01
Condition : EN55015 Conduction(QP) Phase: N
Company : Power : 0
EUT Model: 7W-6-11
Execute Program :
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Comment
	0.1698	52.48	QP	10.76	63.23	64.97	-1.74	
	0.1698	43.37	AVG	10.76	54.12	54.97	-0.85	
	0.4378	40.50	QP	10.62	51.12	57.11	-6.99	
	0.4378	31.49	AVG	10.62	42.11	47.11	-5.00	
	0.7643	43.38	QP	10.62	53.88	56.00	-2.12	
*	0.7643	34.79	AVG	10.62	45.31	46.00	-0.69	
	0.9155	42.62	QP	10.43	52.95	56.00	-3.05	
	0.9155	33.28	AVG	10.43	43.71	46.00	-2.29	
	2.0958	43.02	QP	10.08	53.10	56.00	-2.90	
	2.0958	27.78	AVG	10.08	37.86	46.00	-8.14	

Reference BOM List

Table 1-2. BOM list

NO	品名	規格	插件位置
1	MDB04G	400V/0.8A	B1
2	X-CAP	0.1uF/275V/X2 P.10	C1
3	Cap	100pF / 1KV	C10
4	X-CAP	0.1uF/275V/X2 P.10	C11
5	CAP 電容	22uF / 200V / 10*16	C2
6	TAJ	10uF / 35V / CASE C	C3
7	TAJ	TAJ 4.7uF / 25V / CASE B	C4
8		1uF/X7R/ 0603	C5
9	CAP X2Y	2200pF/X7R/ 0603	C6
10	CAP X2Y	10n F/X7R / 0603	C7
11	CAP X2Y	0.001uF/X7R/0603	C8
12	CAP X2Y	0.01uF/X7R/ 0603	C9
13	Y-cap	4700pF M 250V Y2 P.10	CY1
14	USM26PT	50~1000V, current 2A	D1
15	USM26PT	50~1000V, current 2A	D2
16	STPS3150UF		D3
17	USM13PT	50~1000V, current 1A	D4
18	CH015H-40PT / SOD-323		D5
19	Fuse	1A / 250V 3.6X10 SB PT PB-FREE 1A	F1
20	PK0406-102K-UL	1.5mH	L1
21	PK0406-102K-UL	560uH	L2
22	V07E300P(MOV)	Peak Surge Current @ 8/20uS:1750A Clamping Voltage Max, Vc:775V	MOV1
23	1206	460K 5% / 1206	R1
24	0603	470R 5% / 0603	R10
25	0603	22K 5% / 0603	R11
26	0603	20K 5% / 0603	R12
27	0603	6.8K 5% / 0603	R13
28	0603	620R 5% / 0603	R14
29	0603	7.5K 5% / 0603	R15
30	0603	1K_5% / 0603	R16
31	0603	1K_5% / 0603	R17
32	0603	1M_5% / 1206	R18
33	1206	1M_5% / 1206	R19
34	1206	460K_5% / 1206	R2
35	1206	680R_5% / 1206	R20
36	1206	0.62R_1% / 1206	R3
37	1206	1.2R_1% / 1206	R4
38	1206	49.9R_5% / 0603	R5
39	0603	49.9R_5% / 0603	R6
40	0603	100K_5% / 0603	R7
41	0603	30K_5% / 0603	R8
42	0603	1.5K_5% / 0603	R9
43	EE13		T1
44	TLP621 / PC817 /		U2
45	UTC603A	SOP-8	U3
46	ST9L001	SOT-26	U3
47	CEP01N65	650V/2A	Q1

Reference Design I (L9M062/L9M101)

General Description

L9M062/L9M101 high power efficiency and high power factor (L9M062) non-isolated LED power module, which total components can reduce below 30 parts.

Constant current driver mode for steady power supply

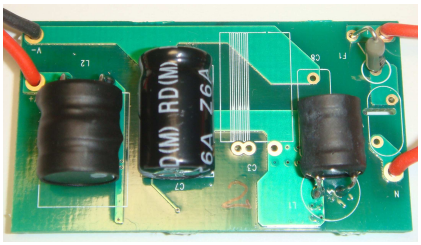
High efficiency for energy saving, more efficient than Incandescent and Halogen lamps

It is suitable for all global bulb (E27/E17), Par spotlight (Par30/Par38) and down & Ceiling interior lighting, such as offices, hotels, shopping malls, retails, hospitals and show rooms lighting, etc;

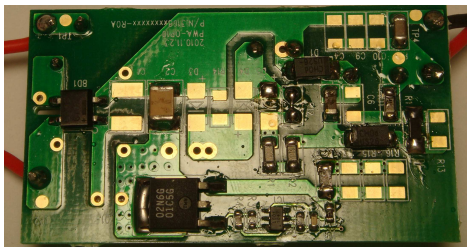
Dimension:

(1.) L=45mm, W=25mm, H=18mm (customized for E27 space)

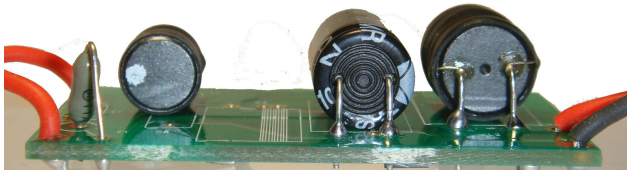
(2.) L=53mm, W=3mm, H=18mm (customized for Down & Ceiling light)



Top Side



Back Side



Height

Fig 2-1. PCB Assembly

Schematic

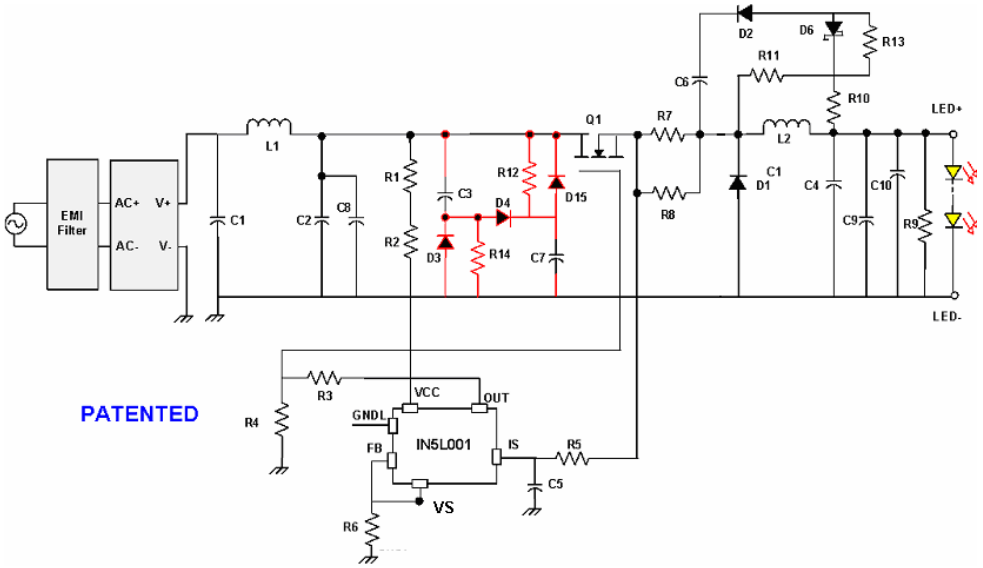


Fig 2-2. Design Schematic

Electrical Characteristics (V_{CC} =12V, Ta=25

Output

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
DC-Voltage	V_{out}		32		V	
Rated current	I_{out}	285	300	315	mA	
Rated power	P_{out}		9.6		W	
Ripple current (max.)	I_{ripple}			100	mA	(p-p)@100VAC/60Hz*
Line regulation	%	-1.5%	-	1.5%	%	Line regulation is measured at full load
Turn on time	T_{on}			1	S	@100VAC and @220VAC

∗Ripple current are measured at 20MHz of bandwidth by using a 15cm twisted pair-wire terminated with no parallel capacitor

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Voltage Range	V_{in}	90		264	Vac	
Frequency Range	f	47		63	Hz	
Efficiency	η	**80**	**88**		%	@110VAC @220VAC
Power factor	PF		**>0.85** **>0.83**			@110VAC @220VAC
AC curren	I_{ac}		-	0.14	A	@100VAC
				0.07	A	@220VAC

Proteciton

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Over load	OLP	120			%	Above 120% rated output power Protection type : oveload limit
Short circuit	SCP					Protection type : recover automatically after fault condition removed

Enviroment

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Working temp.	$T_{operation}$	-20		60	°C	Refer to output load derating curve
Working humidity		20		90	%	RH non-condensing
Storage temp	$T_{stirage}$	-40		85	°C	
Storage .,humidity		10		95	%	
Temp. Coefficient	T_{ef}	0.035		0.035	%/°C	0~45 °C

Table 2-1: Efficiency and Power Factor

Input Voltage V	Input Current mA	Input Power W	Output Voltage V	Output Current mA	Output Power W	Efficiency %	PF	Io Error %
90	135.29	10.76	32.35	285.81	9.25	85.94	0.88	-5.73
100	127.48	11.23	32.51	297.07	9.66	85.97	0.88	-2.02
110	**11.78**	**11.30**	**32.48**	**298.87**	**9.71**	**85.89**	**0.87**	**-1.42**
120	109.23	11.35	32.46	300.17	9.74	85.83	0.86	-1.00
130	102.02	11.40	32.44	301.04	9.76	85.68	0.86	-0.71
140	95.47	11.43	32.42	301.33	9.77	85.47	0.85	-0.61
150	90.16	11.47	32.40	301.67	9.77	85.24	0.85	-0.50
160	85.21	11.51	32.38	302.26	9.79	85.03	0.84	-0.31
170	81.51	11.56	32.37	302.62	9.79	84.77	0.83	-0.19
180	77.89	11.62	32.35	303.19	9.81	84.44	0.83	0.00
190	74.27	11.69	32.34	303.93	9.83	84.10	0.83	0.24
200	70.61	11.76	32.33	304.56	9.85	83.75	0.83	0.45
210	67.32	11.83	32.33	305.12	9.86	83.39	0.83	0.64
220	**64.56**	**11.88**	**32.31**	**305.02**	**9.85**	**82.98**	**0.84**	**0.60**
230	62.02	11.91	32.28	304.73	9.84	82.61	0.83	0.51
240	59.98	11.96	32.27	304.44	9.82	82.17	0.83	0.41
250	58.12	12.00	32.25	304.31	9.82	81.78	0.82	0.37
264	55.86	12.08	32.24	304.28	9.81	81.24	0.82	0.36

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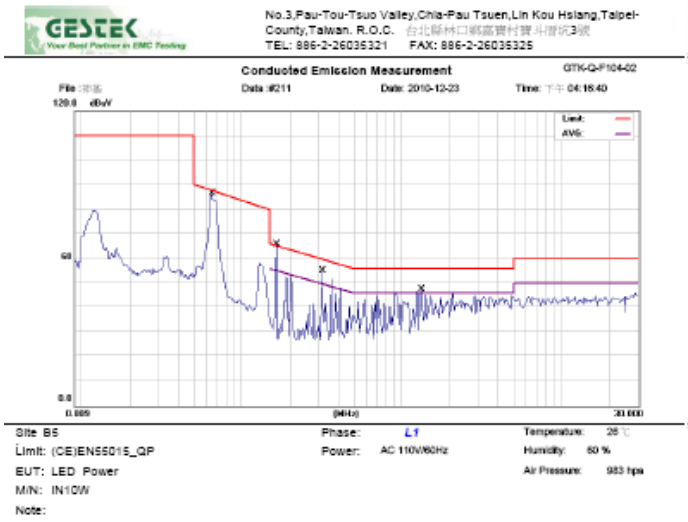

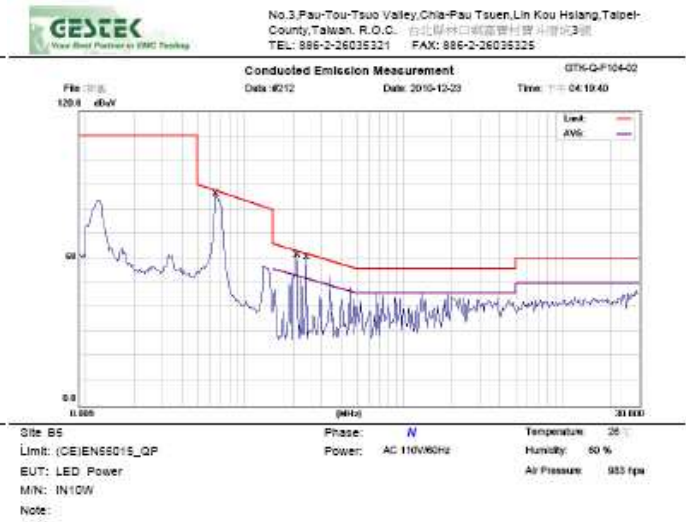

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.0649	70.04	9.70	79.74	87.63	-7.89	QP	
2	*	0.1655	48.57	9.60	58.17	65.18	-7.01	QP	
3		0.1655	24.65	9.60	34.25	55.18	-20.93	AVG	
4		0.3174	37.48	9.60	47.08	59.77	-12.69	QP	
5		0.3174	15.52	9.60	25.12	49.77	-24.65	AVG	
6		1.3463	31.64	9.63	41.27	56.00	-14.73	QP	
7		1.3463	18.63	9.63	28.26	46.00	-17.74	AVG	

No.	Mk.	Freq.	Reading Level	Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.0659	71.70	9.72	81.42	87.49	-6.07	QP	
2		0.2114	45.88	9.60	55.48	63.15	-7.67	QP	
3		0.2114	33.14	9.60	42.74	53.15	-10.41	AVG	
4		0.2427	43.83	9.60	53.43	62.00	-8.57	QP	
5		0.2427	17.70	9.60	27.30	52.00	-24.70	AVG	

*:Maximum data x:Over limit !:over margin •Reference Only
Receiver: ESCS30 Spectrum Analyzer:
L.I.S.N: ENV216/100108(2010.05.24) Test Result: Pass
Pulse limiter: Engineer Signature: Ben
File :\Data\Data :#211 Page: 1

*:Maximum data x:Over limit !:over margin •Reference Only
Receiver: ESCS30 Spectrum Analyzer:
L.I.S.N: ENV216/100108(2010.05.24) Test Result: Pass
Pulse limiter: Engineer Signature: Ben
File :\Data\Data :#212 Page: 1

Reference BOM List

Table 2-2. BOM list

NO	品名	單位	組成用量	插件位置	插件方式
1	Fuse 1A / 250V 3.6X10 SB PT PB-FREE 1A	EA	1	F1	人工插件
2	15WCYB_07471	EA	1	V1	人工插件
3	750K 5% / 1206	EA	1	R1	SMD
4	750K 5% / 1206	EA	1	R2	SMD
5	49.9R 5% / 0603	EA	1	R3	SMD
6	100K 5% / 0603	EA	1	R4	SMD
7	49.9RK 5% / 0603	EA	1	R5	SMD
8	20K 5% / 0603	EA	1	R6	SMD
9	2.2R 5% / 1206	EA	1	R7	SMD
10	3.1K 5% / 1206	EA	1	R10	SMD
11	CAP 0.1uF / 500V / 1812	EA	1	C1	SMD
12	CAP 0.1uF / 500V / 1812	EA	1	C2	SMD
13	CAP 6.8uF / 200V / 105C / 8*11.5/RX30	EA	1	C3	人工插件
14	4.7uF / 50V / X7R / 1206	EA	1	C4	SMD
15	0.01uF / 50V / X7R / 0603	EA	1	C5	SMD
16	4.7uF / 25V / X7R / 1206	EA	1	C6	SMD
17	CAP 6.8uF / 200V / 105C / 8*11.5/RX30	EA	1	C7	人工插件
18	CAP 0.03uF / 630V / 塑膠電容	EA	1	C8	人工插件
19	02N6G/2A/600V/5R/TO-252	EA	1	Q1	人工插件
20	USM26PT/2A/600V/SMA	EA	1	D1	SMD
21	USM13PT/1A/200V/SMA	EA	1	D2	SMD
22	USM26PT/2A/600V/SMA	EA	1	D3	SMD
23	USM26PT/2A/600V/SMA	EA	1	D4	SMD
24	USM26PT/2A/600V/SMA	EA	1	D5	SMD
25	ZENER 15V/SMA	EA	1	D6	SMD
26	B6S /600V / 800mA	EA	1	BD1	SMD
27	PCB0810-222K_2.2mH	EA	1	L1	人工插件
28	PCB1016-122K_1.2mH	EA	1	L2	人工插件
29	IN5L001	EA	1	IC1	SMD

Revision History

REVISION	DESCRIPTION	PAGE	DATE
0.1	First release		2011/01/25
1.0	Final release		2011/03/22