MPCS-R41XN-8L Series

DIP8, DC Input, Dual Channel Normally Open PhotoMOS Opto-Relay

Description

The MPCS-R41XN-8L series combine an LED which is optically coupled to a photovoltaic chip to drive two MOSFET individually on dual channel in a plastic DIP8 package with different lead forming options. With the patenting stack die structure, MPCS-R41XN-8L series provide the finest trigger current and faster switching time performance.

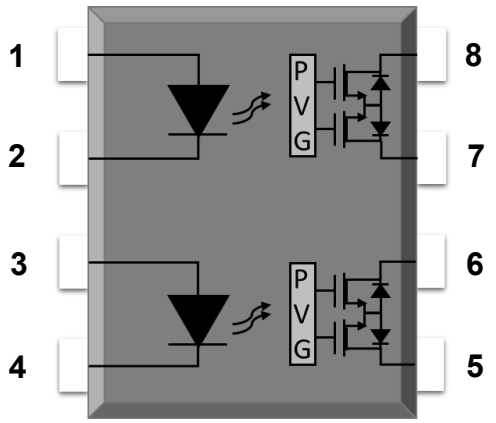
Features

- Low trigger current and high switching time
- High isolation 5000 V_{RMS}
- Guaranteed performance over temperature -40°C ~ +110°C.
- RoHS & REACH Compliance
- Regulatory Approvals
  - UL - UL1577
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898

Applications

- Computer peripheral interface
- Telephone equipment
- Data communication equipment
- Computers

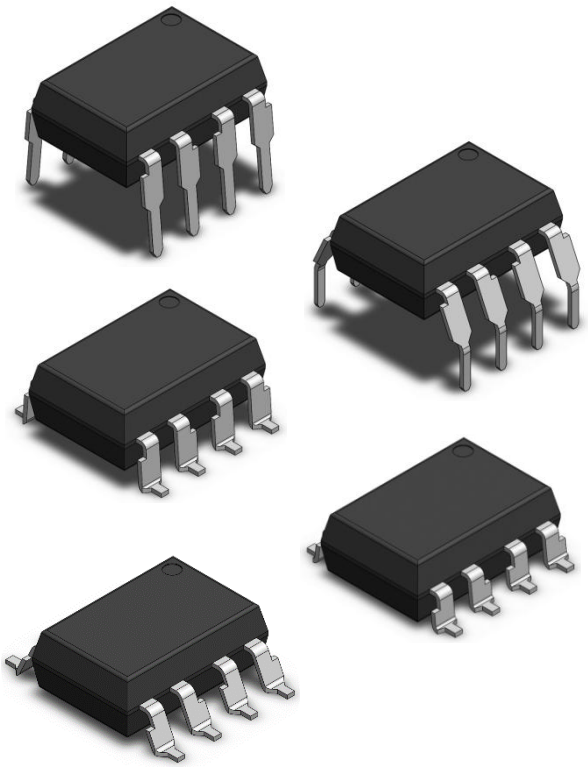
SCHEMATIC



PIN DEFINITION

1. Anode	8. Terminal 1
2. Cathode	7. Terminal 2
3. Anode	6. Terminal 1
4. Cathode	5. Terminal 2

PACKAGE OUTLINE



ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	MIN.	MAX.	UNIT	NOTE
INPUT CHARACTERISTICS						
Average Forward Input Current		I_F	-	20	mA	-
Peak Transient Current		$I_{F(trans)}$	-	1	A	1
Reverse Input Voltage		V_R	-	5	V	-
Input Power Dissipation		P_I	-	45	mW	-
OUTPUT CHARACTERISTICS						
Output IC Power Dissipation		P_O	-	500	mW	-
Load Voltage	R411N	V_L	-	60	V	-
	R412N			250		
	R413N			400		
	R414N			600		
Continuous Load Current	R411N	I_L	-	0.55	A	-
	R412N			0.15		
	R413N			0.12		
	R414N			0.05		
Peak Load Current	R411N	I_{PEAK}	-	1.2	A	-
	R412N			0.5		
	R413N			0.3		
	R414N			0.15		
COMMON CHARACTERISTICS						
Storage Temperature		T_{stg}	-55	125	°C	-
Operating Temperature		T_{opr}	-40	110	°C	-
Isolation Voltage		V_{iso}	5000	-	V_{rms}	2
Total Power Dissipation		P_O	-	550	mW	-
Lead Solder Temperature		T_{sol}	-	260	°C	-

Note 1. ≤1μs P.W, 300pps

Note 2. AC For 1 Minute, R.H. =40~60%

ELECTRICAL OPTICAL CHARACTERISTICS

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
INPUT CHARACTERISTICS								
Input Forward Voltage		V_F	1.6	2	2.4	V	I_F = 10mA	-
Input Reverse Voltage		I_R	-	-	10	uA	V_R = 6V	-
Input Capacitance		C_{IN}	-	60	-	pF	f = 1MHz, V_F = 0V	-
OUTPUT CHARACTERISTICS								
Off State Leakage Current		I_{LEAK}	-	-	1	μA	I_F = 0mA V_L=Rated V_L MAX	-
On State Resistance	R411N	$Rd_{(ON)}$	-	1.2	2.5	Ω	I_F = 5mA, I_L=Rated I_L MAX t = 1s	-
	R412N		-	7.5	15			
	R413N		-	23	30			
	R414N		-	30	70			
Output Capacitance		C_{OUT}	-	80	-	pF	V=0, f = 1MHz	-
TRANSFER CHARACTERISTICS								
LED operate current		I_{FON}	-	0.2	2	mA	I_L=Rated I_L MAX	-
LED turn off voltage		V_{FOFF}	0.8	1.5	-	V	$I_L \leqq 10\ \mu A$	
Turn on time		T_{ON}	-	0.1	1	ms	I_F=10mA, I_L=Rated I_L MAX	-
Turn off time		T_{OFF}		0.02	0.2	ms		
Input-Output Resistance		R_{I-O}	-	10^12	-	Ω	V_{I-O} = 500V DC	-

TYPICAL PERFORMANCE CURVES & TEST CIRCUITS

Fig.1 LED Forward Current vs. Forward Voltage

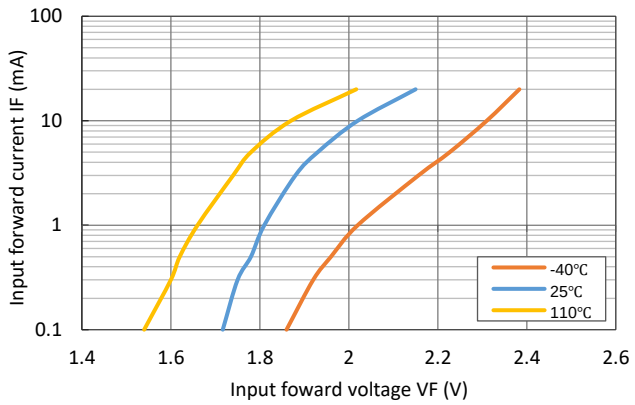


Fig.2 LED operate current vs. Temperature

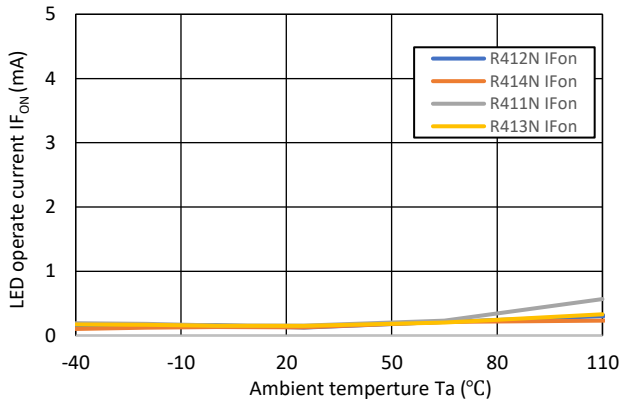


Fig.3 Output Current vs. Output Voltage-R411N

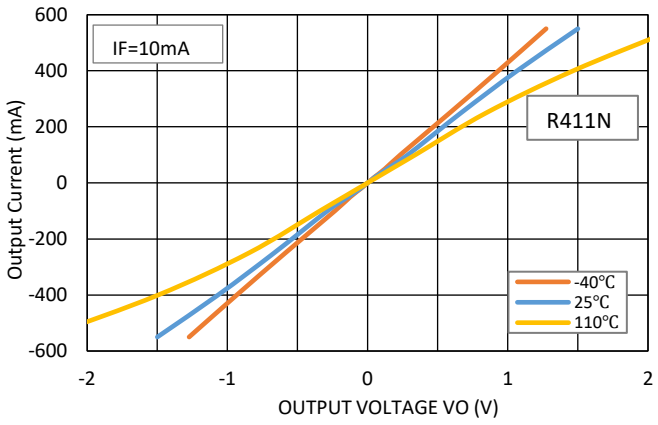


Fig.4 Output Current vs. Output Voltage-R412N

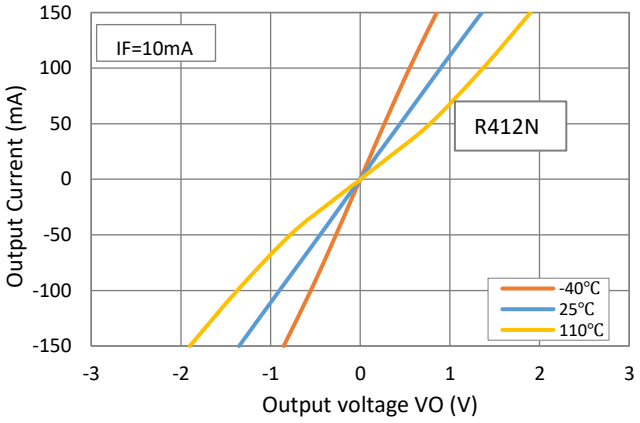


Fig.5 Output Current vs. Output Voltage-R413N

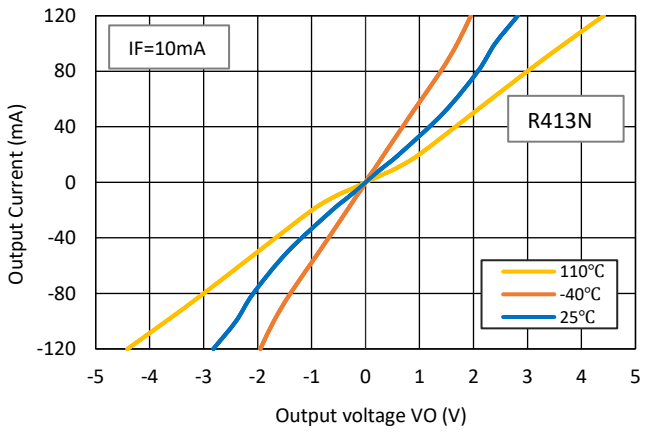


Fig.6 Output Current vs. Output Voltage-R414N

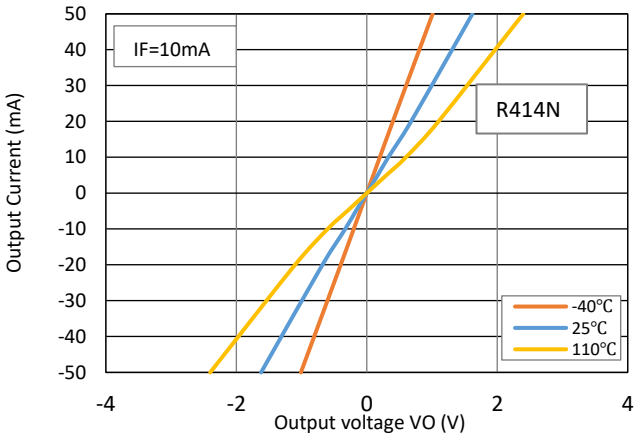


Fig.7 Turn on time vs. Temperature

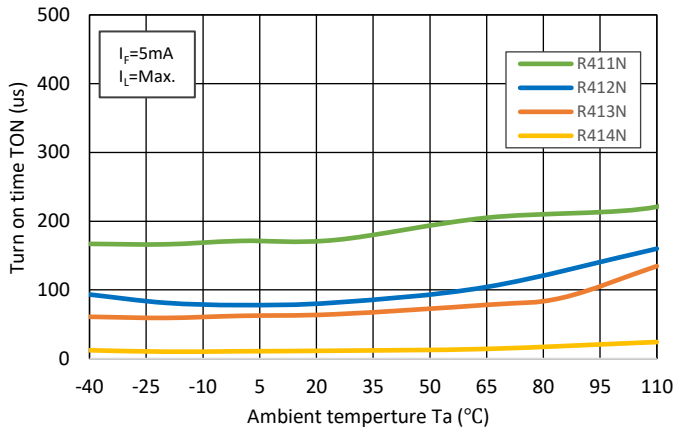


Fig.8 Turn on time vs. Temperature

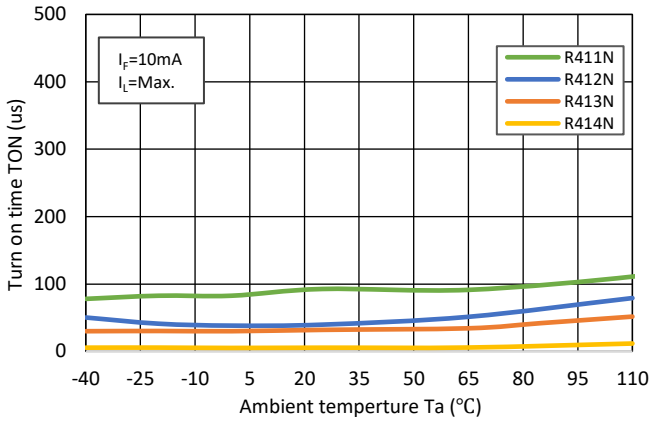


Fig.9 Turn off time vs. Temperature

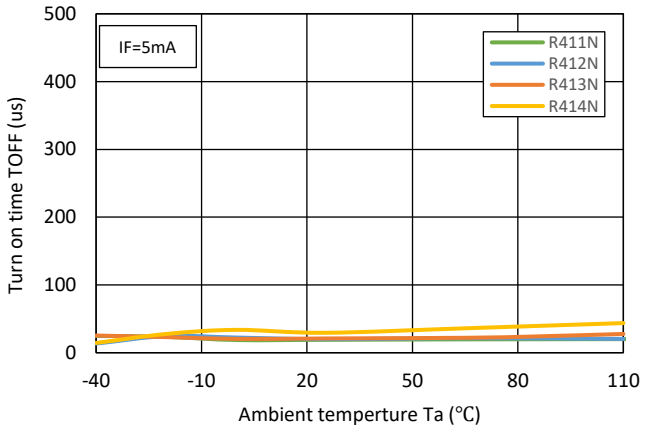


Fig.10 Turn off time vs. Temperature

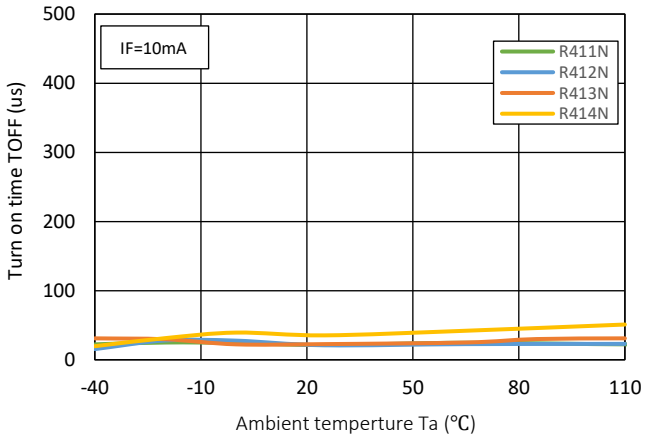


Fig.11 Turn on time vs. LED forward current

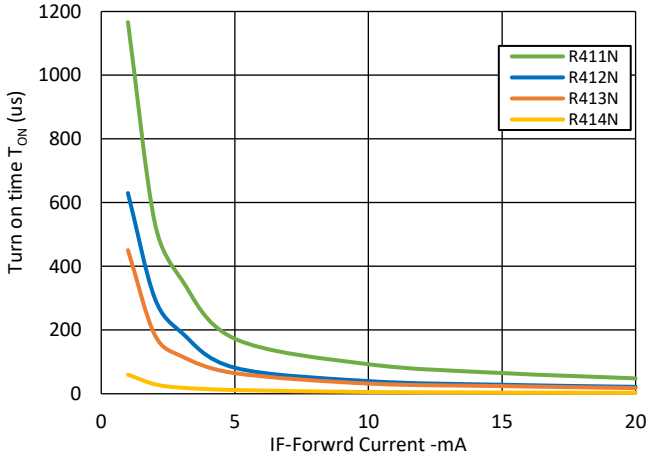
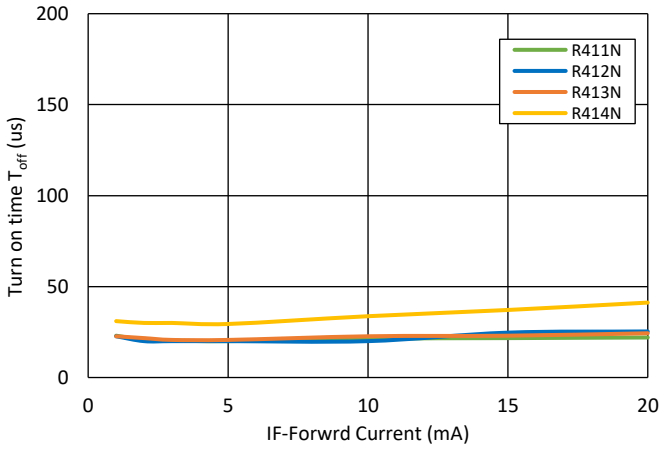
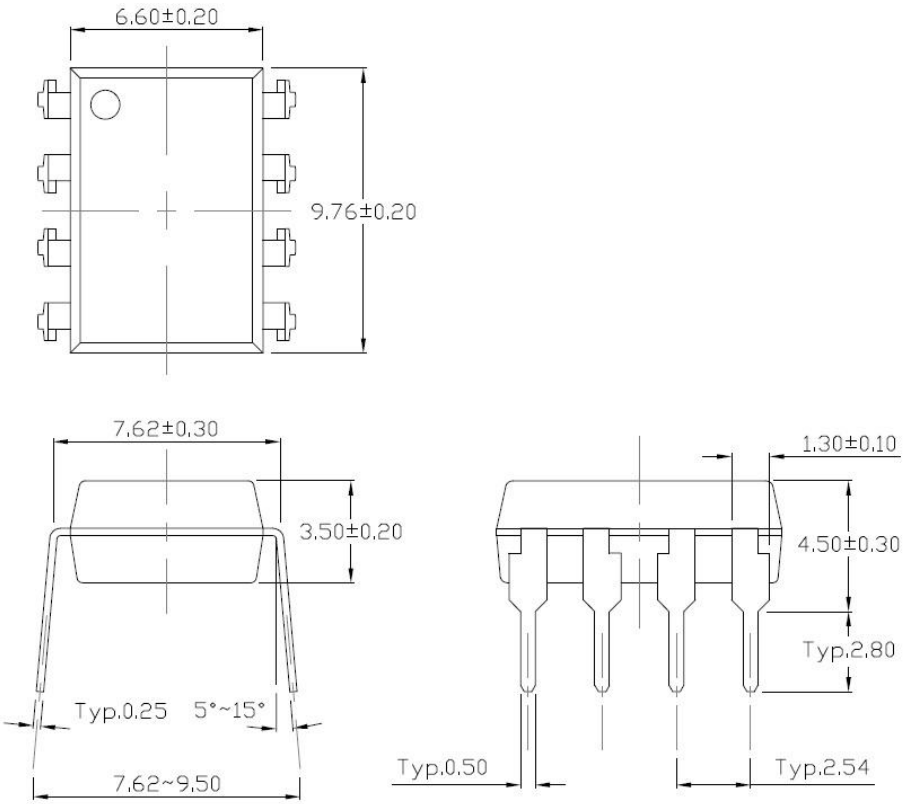


Fig.12 Turn off time vs. LED forward current

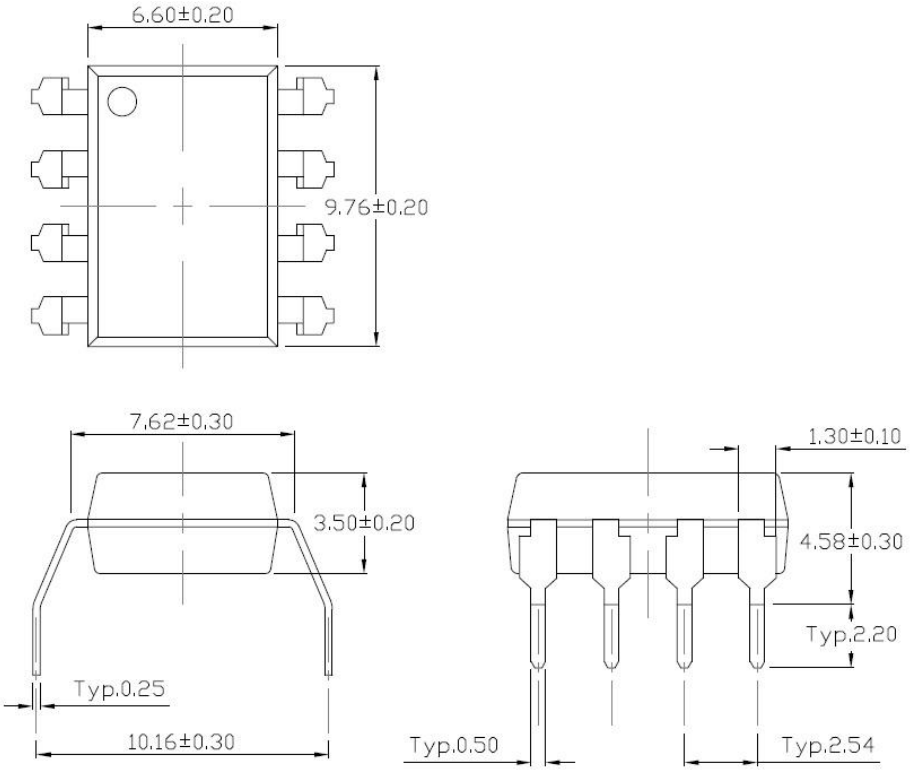


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

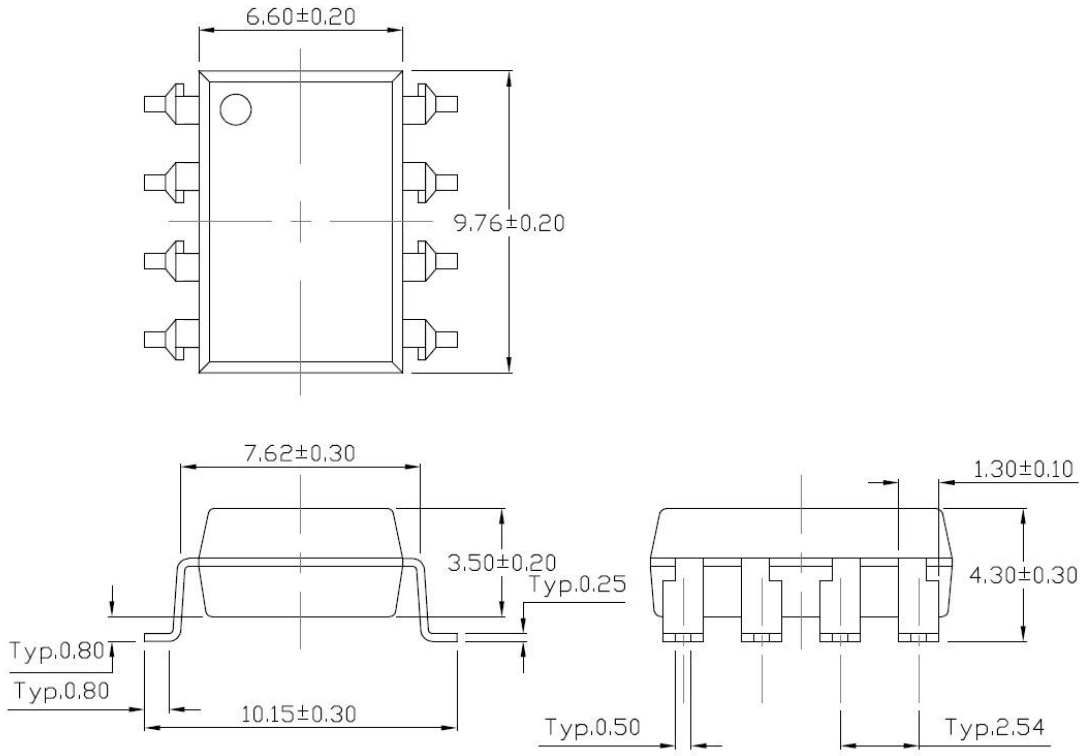
Standard DIP – Through Hole (DIP Type)



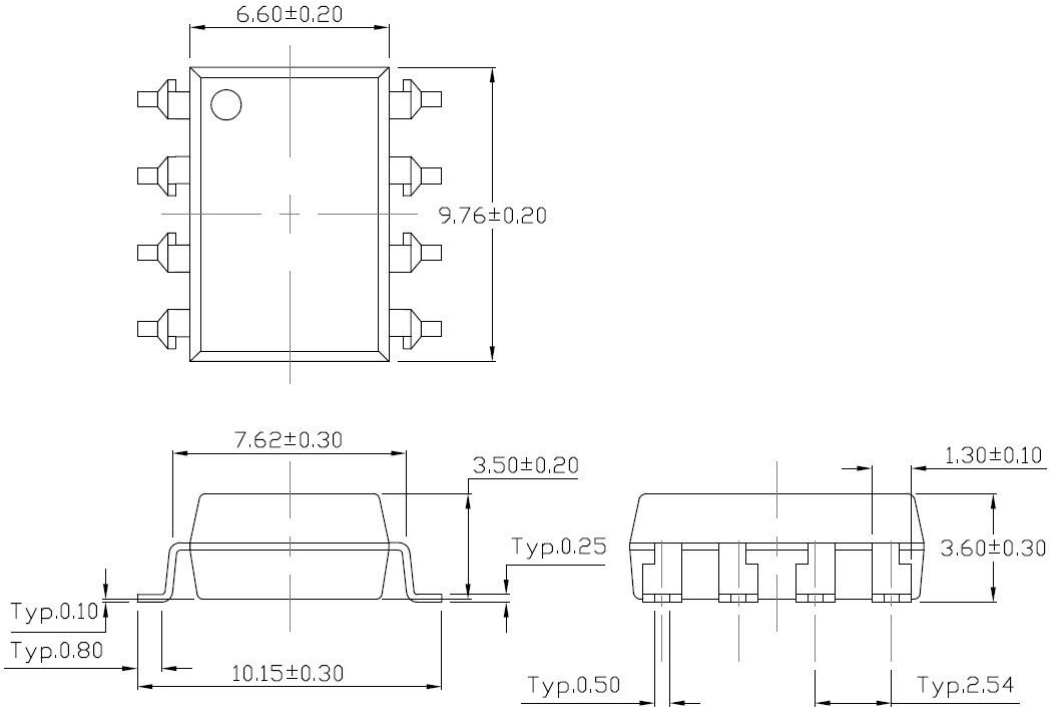
Gullwing (400mil) Lead Forming – Through Hole (M Type)



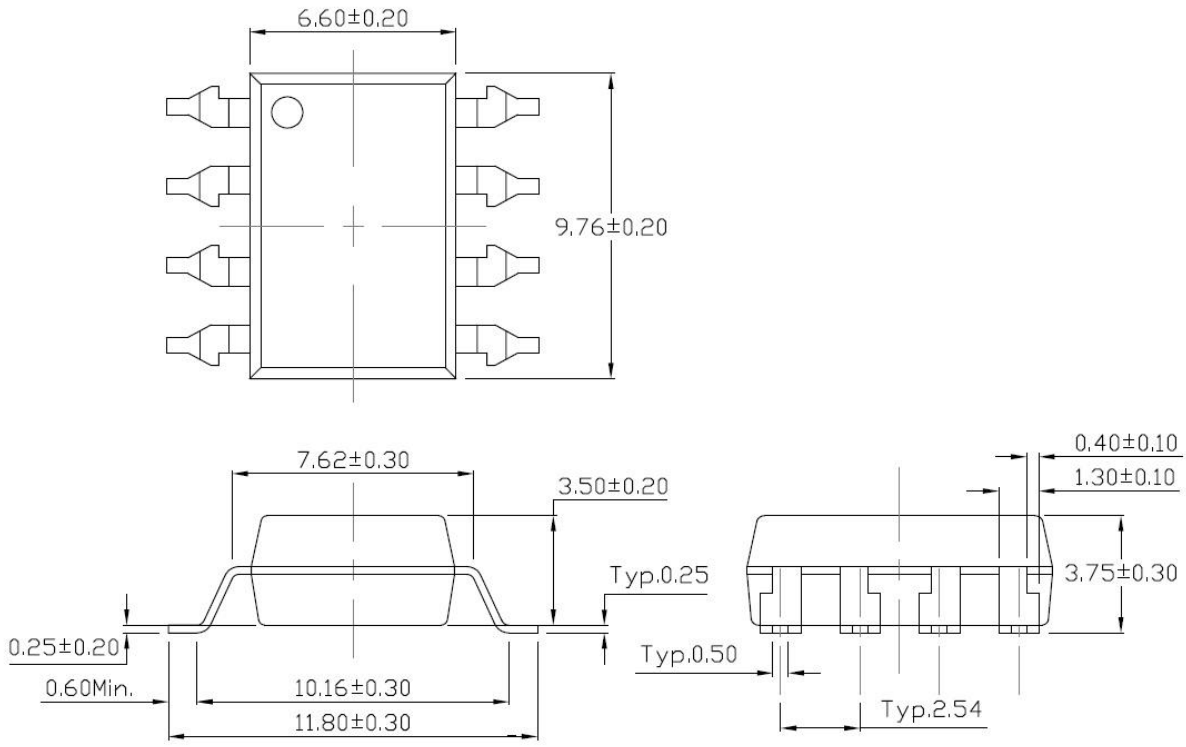
Surface Mount Lead Forming (S Type)



Surface Mount (Low Profile) Lead Forming (SL Type)

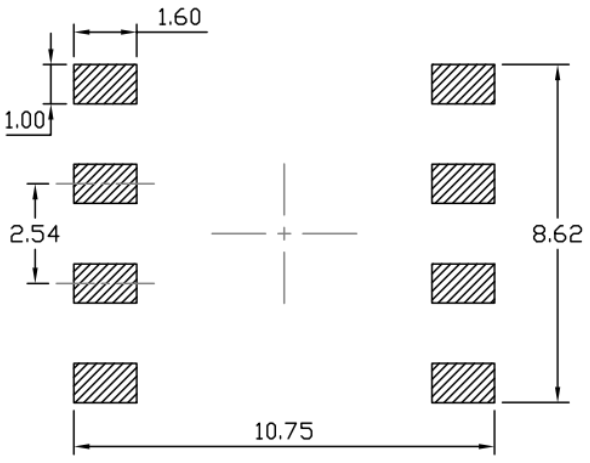


Long Creepage Distance For Surface Mount Type (Option SM)

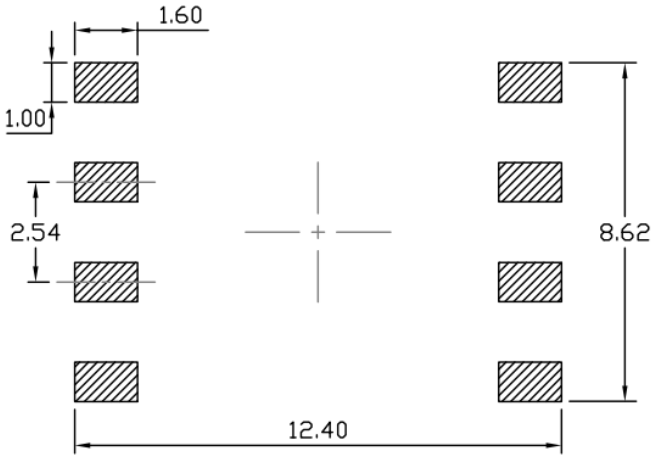


RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

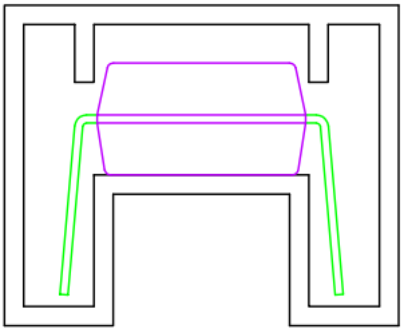
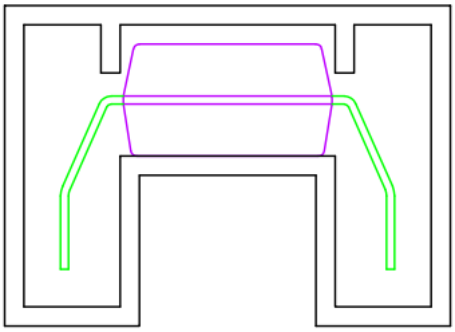
Surface Mount Lead Forming (S/SL Type)



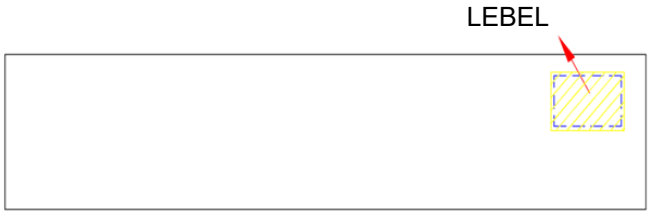
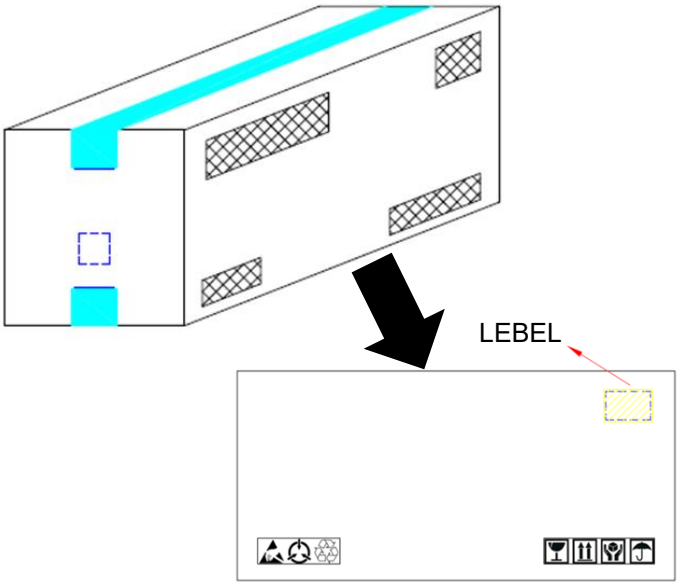
Long Creepage Distance For Surface Mount Type (Option SM)



TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

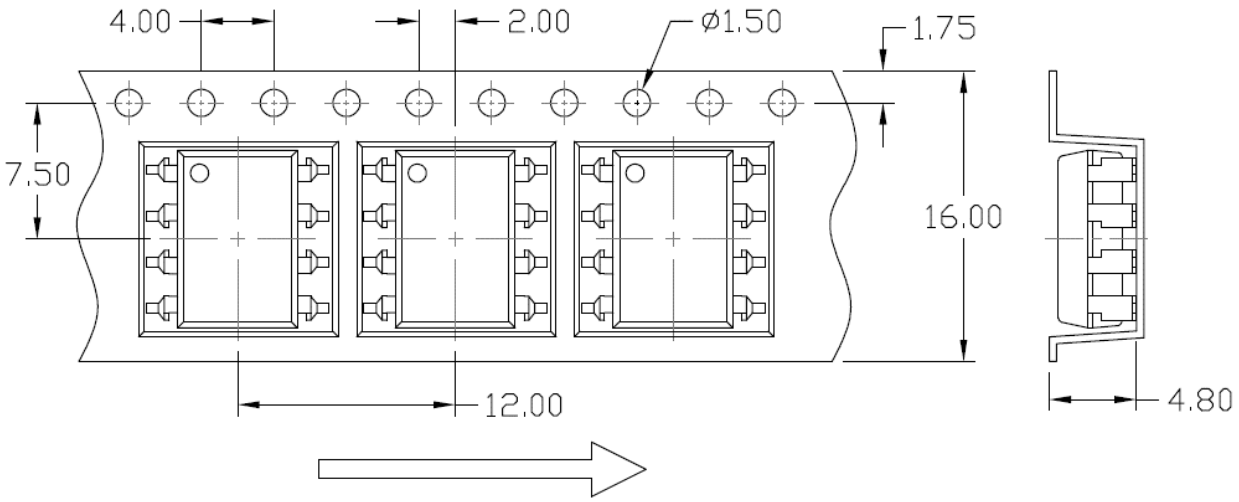
Standard DIP	Option M
 L x W x H = 12.3mm x 10mm x 500mm	 L x W x H = 12.3mm x 10mm x 500mm

BOX SPECIFICATIONS (Tube Type)

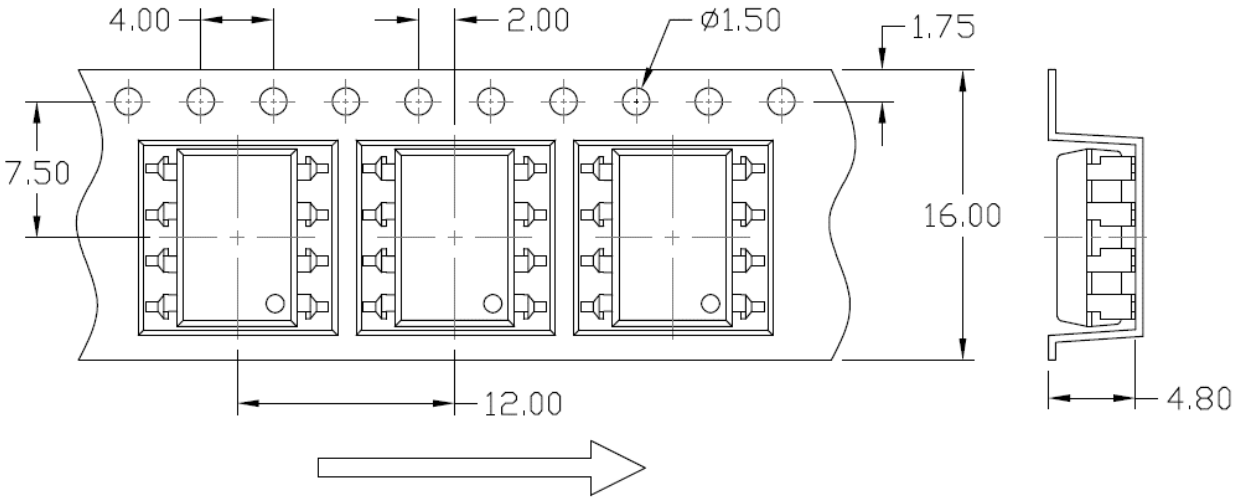
Inner Box	Outer Box
 L x W x H = 52.5cm x 10.7cm x 4.7cm	 L x W x H = 53.5cm x 23.5cm x 25.5cm

CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

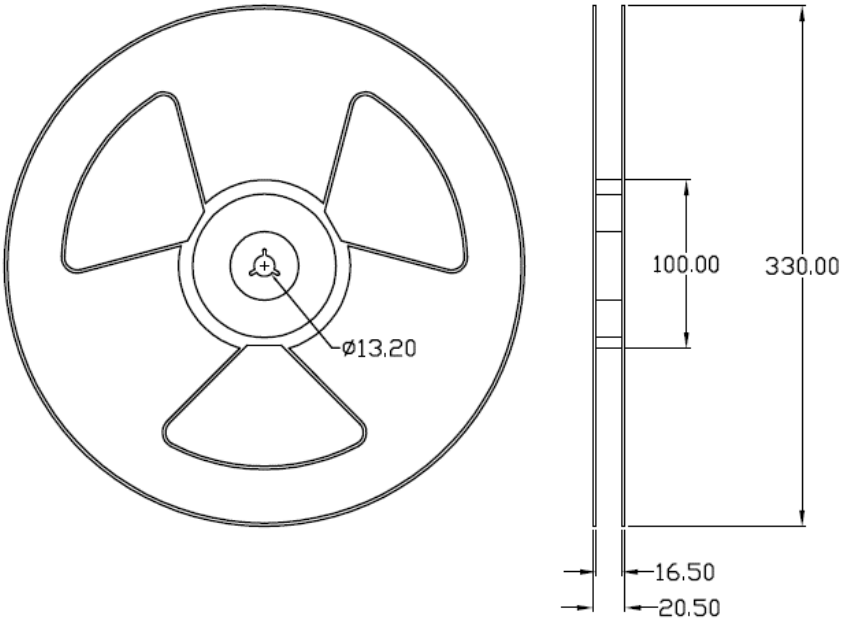
Option T1



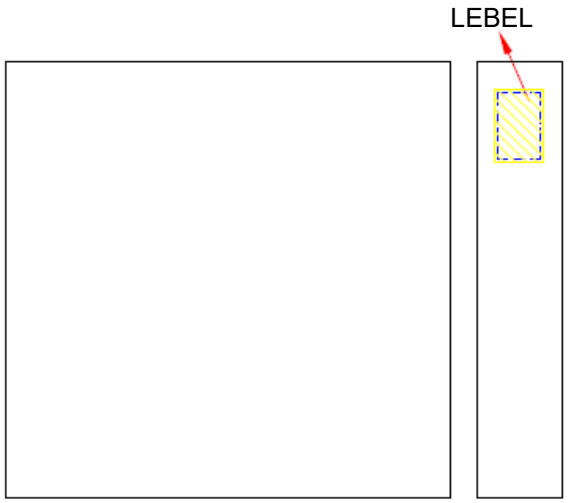
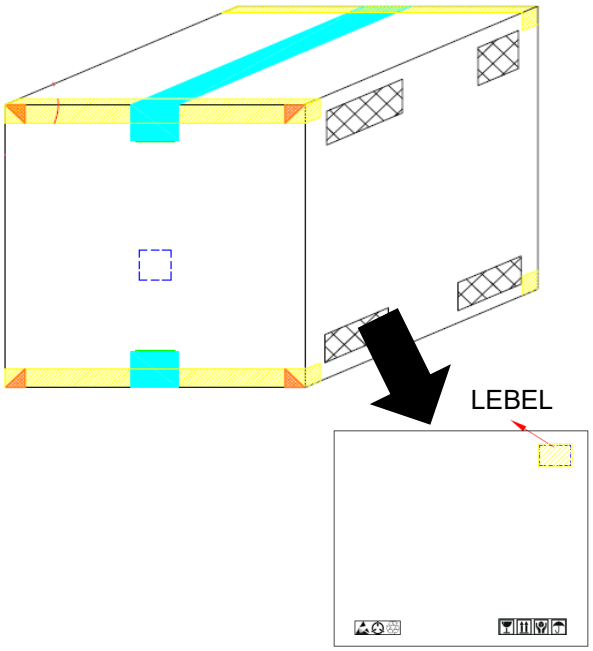
Option T2



REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

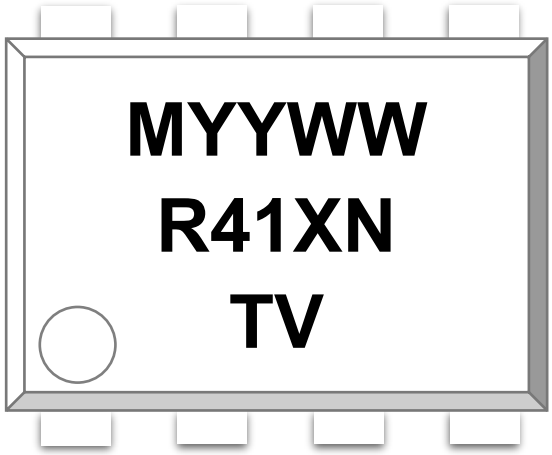


BOX SPECIFICATIONS (Reel Type)

INNER BOX	OUTER BOX
	
L x W x H = 36cm x 36cm x 6.9cm	L x W x H = 45cm x 38cm x 38cm

ORDERING AND MARKING INFORMATION

MARKING INFORMATION



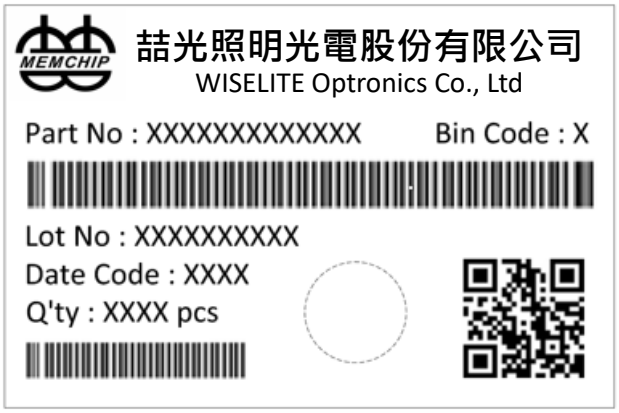
M : Company Abbr.
YY : Year date code
WW : 2-digit work week
R41XN ：Part Number(X=Rank)
T : Factory identification mark
V :VDE Identification(Option)

ORDERING INFORMATION

MPCS-R41XN-8L(Y)(Z)-GV

MPCS – Company Abbr.
R41XN-8L – Part Number(X=Rank)
Y – Lead Form Option(None/M/S/SL/SM)
(None-7mm Clearance or M-10mm Clearance or S/SL-10mm Clearance or SM-11.8mm Clearance)
Z – Tape and Reel Option(None/T1/T2)
G – Green Option(G: Green, None: Non-Green)
V – VDE Option(V or None)

LABEL INFORMATION

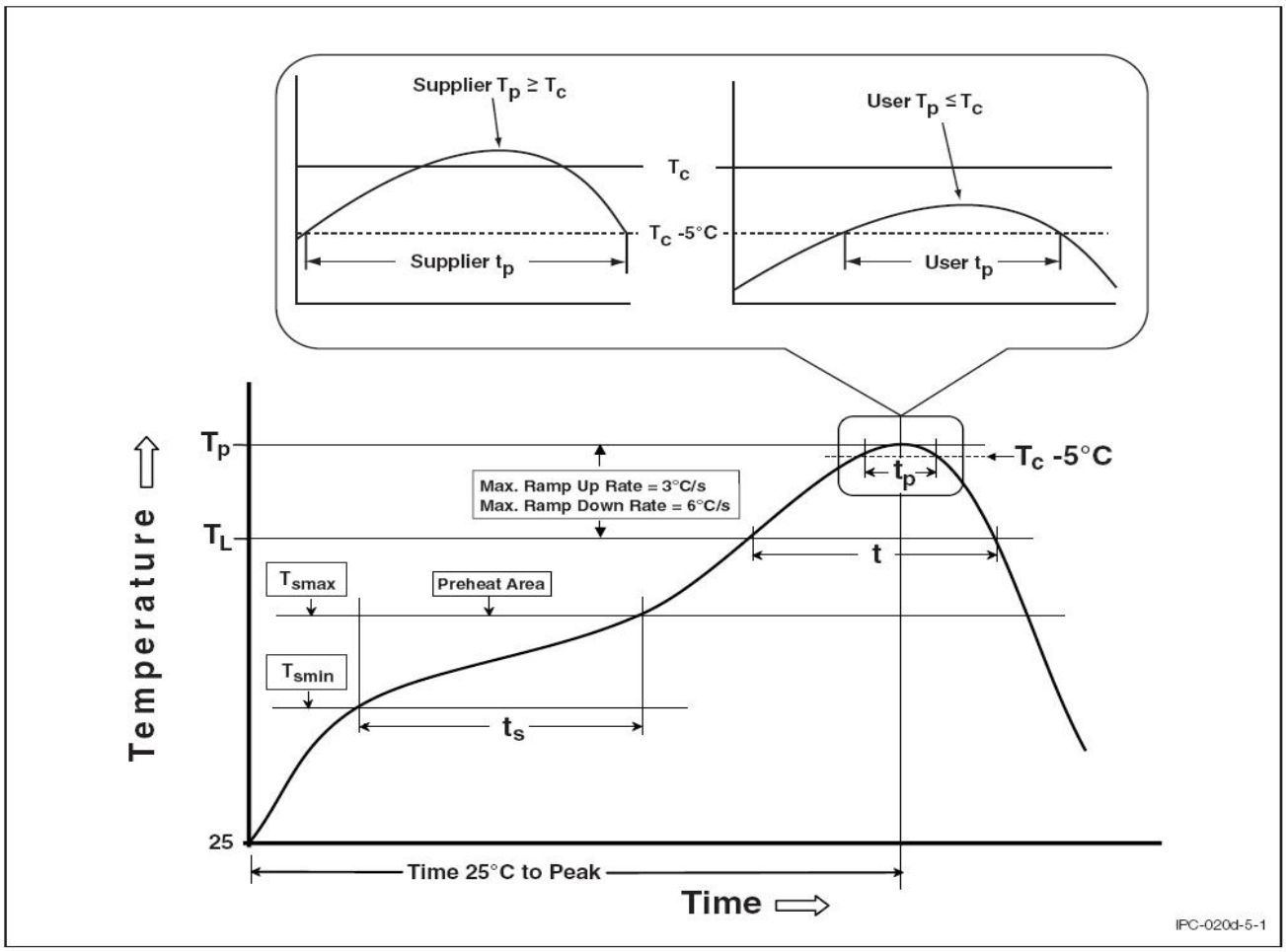


PACKING QUANTITY

Option	Quantity	Quantity – Inner box	Quantity – Outer box
None	45 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box = 14.4k Units
M	45 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box = 14.4k Units
S(T1)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
S(T2)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SL(T1)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SL(T2)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SM(T1)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SM(T2)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units

REFLOW INFORMATION

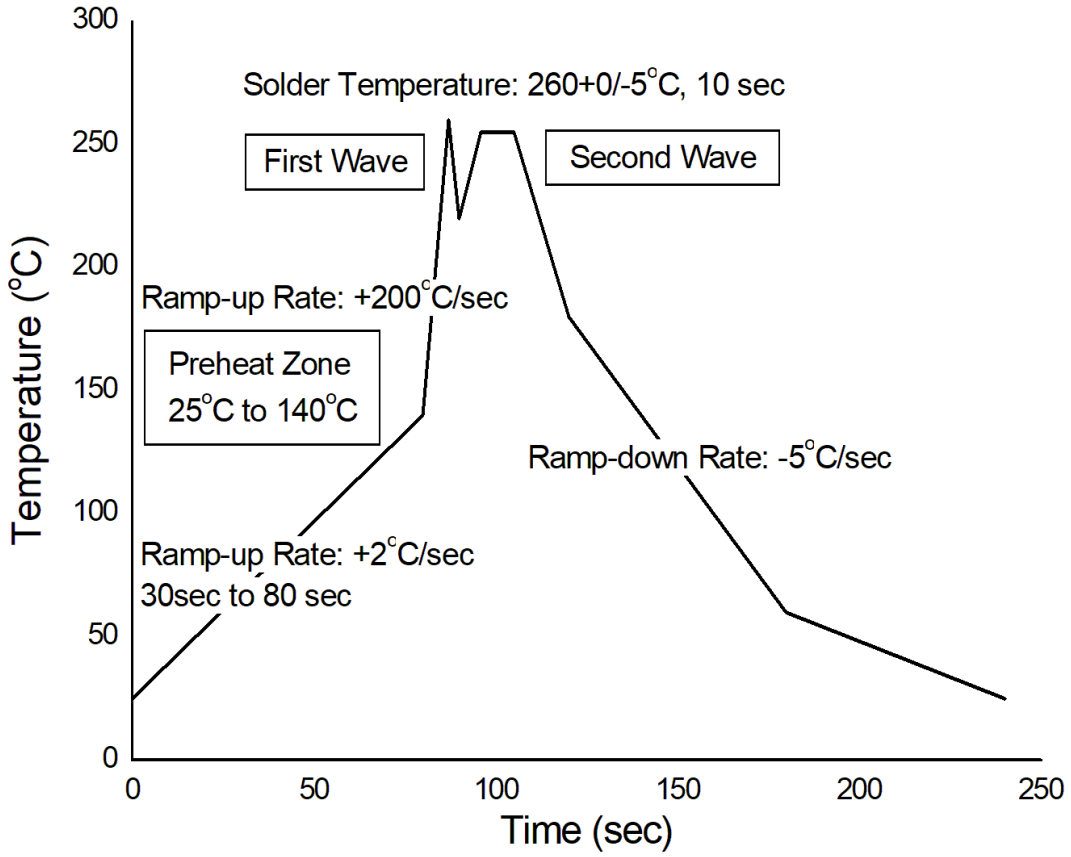
REFLOW PROFILE



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100°C	150°C
Temperature Max. (Tsmax)	150°C	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.	3°C/second max.
Liquidous Temperature (TL)	183°C	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (tP) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

TEMPERATURE PROFILE OF SOLDERING

WAVE SOLDERING (JESD22-A111 COMPLIANT)



HAND SOLDERING BY SOLDERING IRON	
Soldering Temperature	380+0/-5°C
Soldering Time	3 sec max.
One time soldering is recommended for all soldering method.	
Do not solder more than three times for IR reflow soldering.	

DISCLAIMER

- WISELITE is continually improving the quality, reliability, function and design. WISELITE reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
- WISELITE makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, WISELITE disclaims (a) any and all liability arising out of the application or use of any product, (b) any and all liability, including without limitation special, consequential or incidental damages, and (c) any and all implied warranties, including warranties of fitness for particular.
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- This product is not intended to be used for military, aircraft, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Please contact WISELITE sales agent for special application request.
- Immerge unit’s body in solder paste is not recommended.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify WISELITE’s terms and conditions of purchase, including but not limited to the warranty expressed therein.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.