



MPC817 Series

DIP4, DC Input Photo Transistor Coupler

■ Features

- High isolation 5000 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating temperature range - 55 °C to 110 °C
- REACH compliance
- Halogen free
- MSL class 1
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5
 - CQC – GB4943.1-2022
 - DEMKO approved (No. D-07670)
 - FIMKO approved (No. FI/40479/A1)
 - NEMKO approved (No. P20224171)
 - SEMKO approved (No. 1920191)

■ Description

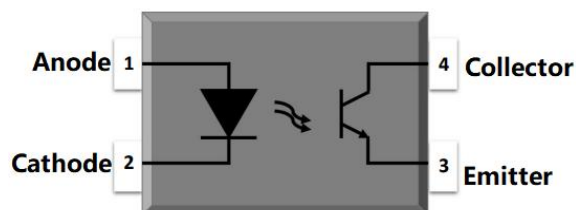
The MPC817 series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic DIP4 package with different lead forming options.

With the robust coplanar double mold structure, MPC817 series provide the most stable isolation feature.

■ Applications

- Switch mode power supplies
- Programmable controllers
- Office equipment
- System appliances, measuring instruments
- Telecommunication equipments
- Signal transmission between circuits of different potentials and impedances
- Home appliances, such as fan heaters, etc.

■ Schematic





MPC817 Series

DIP4, DC Input Photo Transistor Coupler

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	VALUE	UNIT	NOTE
INPUT				
Forward Current	I_F	60	mA	
Peak Forward Current	I_{FP}	1	A	1
Reverse Voltage	V_R	6	V	
Input Power Dissipation	P_I	100	mW	
OUTPUT				
Collector - Emitter Voltage	V_{CEO}	35	V	
Emitter - Collector Voltage	V_{ECO}	6	V	
Collector Current	I_C	50	mA	
Output Power Dissipation	P_O	150	mW	
COMMON				
Total Power Dissipation	P_{tot}	200	mW	
Isolation Voltage	V_{iso}	5000	V _{rms}	2
Operating Temperature	T_{opr}	-55~110	°C	
Storage Temperature	T_{stg}	-55~150	°C	
Soldering Temperature	T_{sol}	260	°C	

Note 1. 100μs pulse, 100Hz frequency Note

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



MPC817 Series

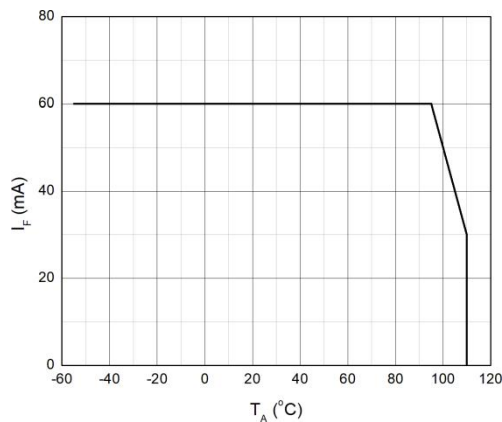
DIP4, DC Input Photo Transistor Coupler

ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C							
PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
INPUT							
Forward Voltage	V _F	-	1.24	1.4	V	IF=10mA	
Reverse Current	I _R	-	-	10	μA	VR=6V	
Input Capacitance	C _{in}	-	10	-	pF	V=0, f=1kHz	
OUTPUT							
Collector Dark Current	I _{CEO}	-	-	100	nA	VCE=20V, IF=0	
Collector-Emitter Breakdown Voltage	BV _{CEO}	35	-	-	V	IC=0.1mA, IF=0	
Emitter-Collector Breakdown Voltage	BV _{ECO}	6	-	-	V	IE=0.1mA, IF=0	
TRANSFER CHARACTERISTICS							
Current Transfer Ratio	MPC817	CTR	50	-	600	%	IF=5mA, VCE=5V
	MPC817A		80	-	160		
	MPC817B		130	-	260		
	MPC817C		200	-	400		
	MPC817D		300	-	600		
	MPC817A1		80	-	160		
	MPC817B9		130	-	260		
	MPC817C1		200	-	400		
	MPC817D1		300	-	600		
Collector-Emitter Saturation Voltage	V _{CE(sat)}	-	0.06	0.2	V	IF=20mA, IC=1mA	
Isolation Resistance	R _{ISO}	10 ¹²	10 ¹⁴	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance	C _{IO}	-	0.4	1	pF	V=0, f=1MHz	
Cut-off Frequency	f _c	-	80	-	kHz	VCE=2V, IC=2mA RL=100Ω,-3dB	3
Response Time (Rise)	t _r	-	6	18	μs	VCE=2V, IC=2mA RL=100Ω	4
Response Time (Fall)	t _f	-	8	18	μs		4

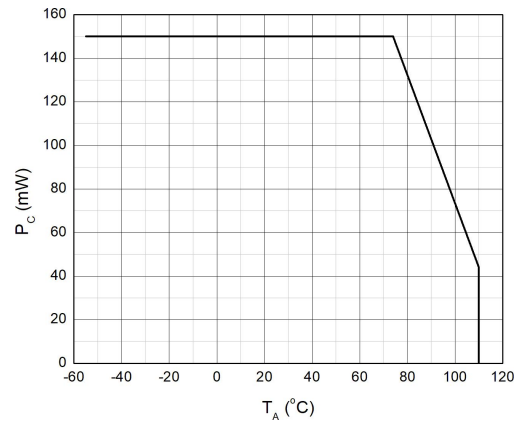
Note 3. Fig.12&13

Note 4. Fig.14

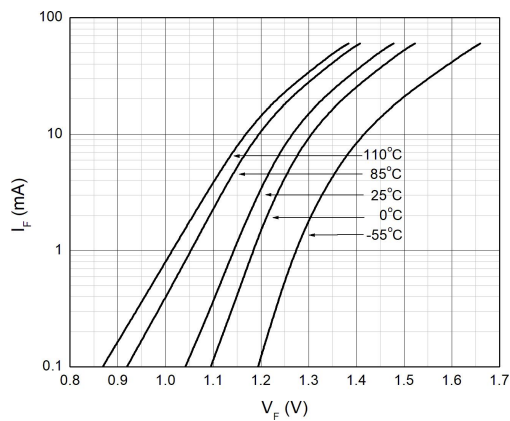
CHARACTERISTIC CURVES



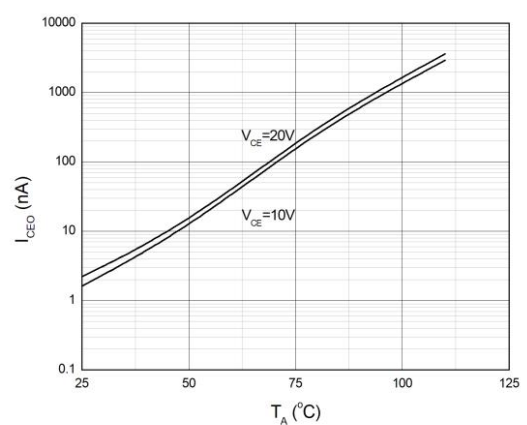
**Fig.1 Forward Current
vs. Ambient Temperature**



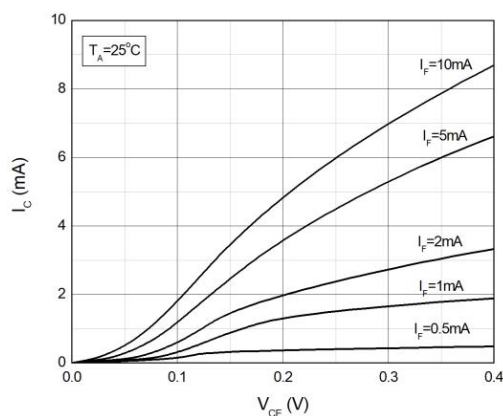
**Fig.2 Collector Power Dissipation
vs. Ambient Temperature**



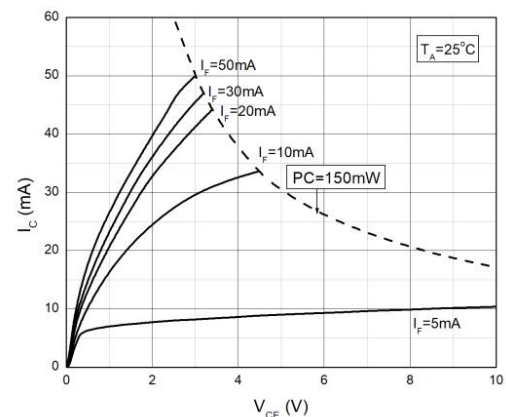
**Fig.3 Forward Current
vs. Forward Voltage**



**Fig.4 Collector Dark Current
vs. Ambient Temperature**



**Fig.5 Collector Current
vs. Collector-emitter Voltage**



**Fig.6 Collector Current
vs. Collector-emitter Voltage**

CHARACTERISTIC CURVES

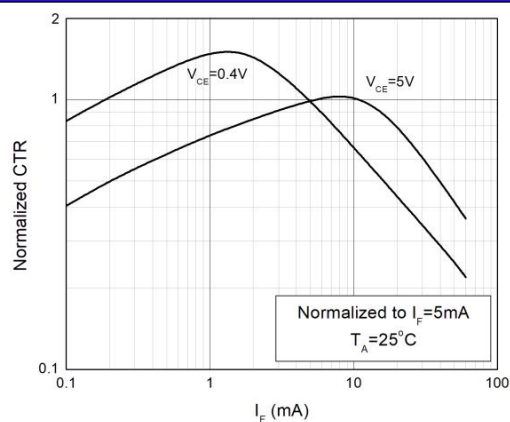


Fig.7 Normalized Current Transfer Ratio vs. Forward Current

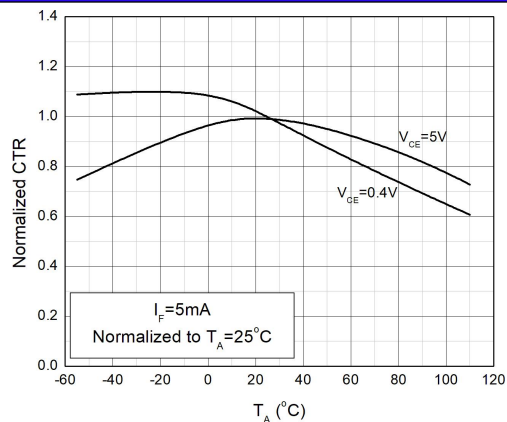


Fig.8 Normalized Current Transfer Ratio vs. Ambient Temperature

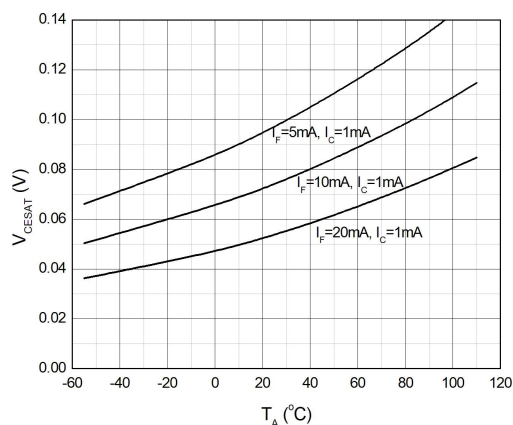


Fig.9 Collector-emitter Saturation Voltage vs. Ambient Temperature

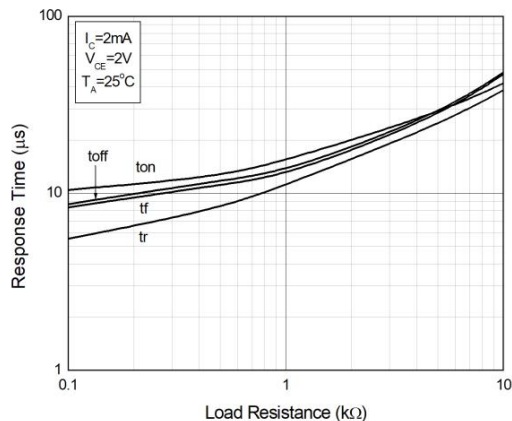


Fig.10 Switching Time vs. Load Resistance

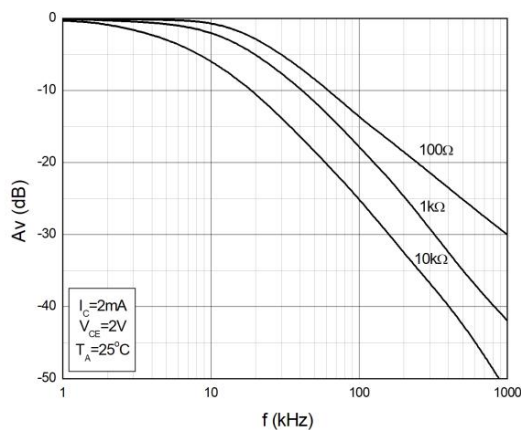


Fig.11 Frequency Response

TEST CIRCUITS

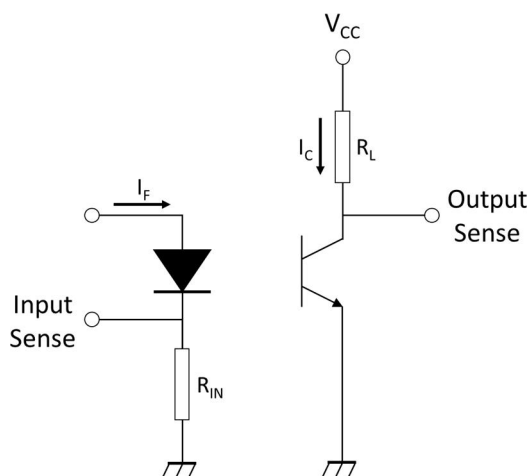


Fig.12 Test Circuits of Response Time

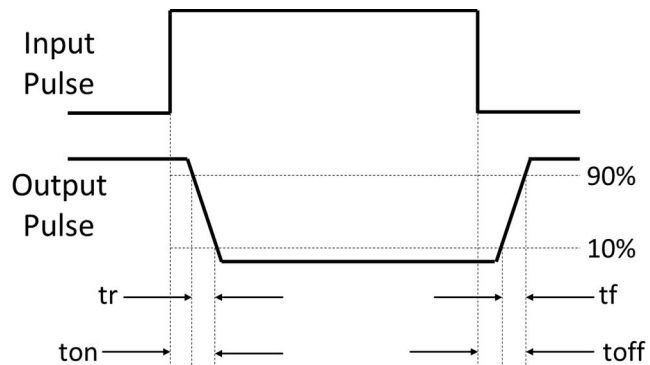


Fig.13 Curves of Response Time

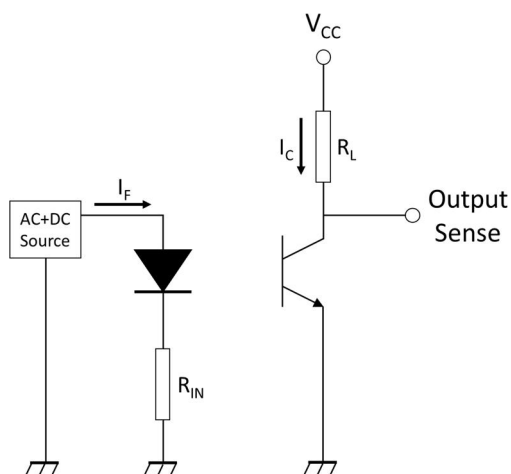
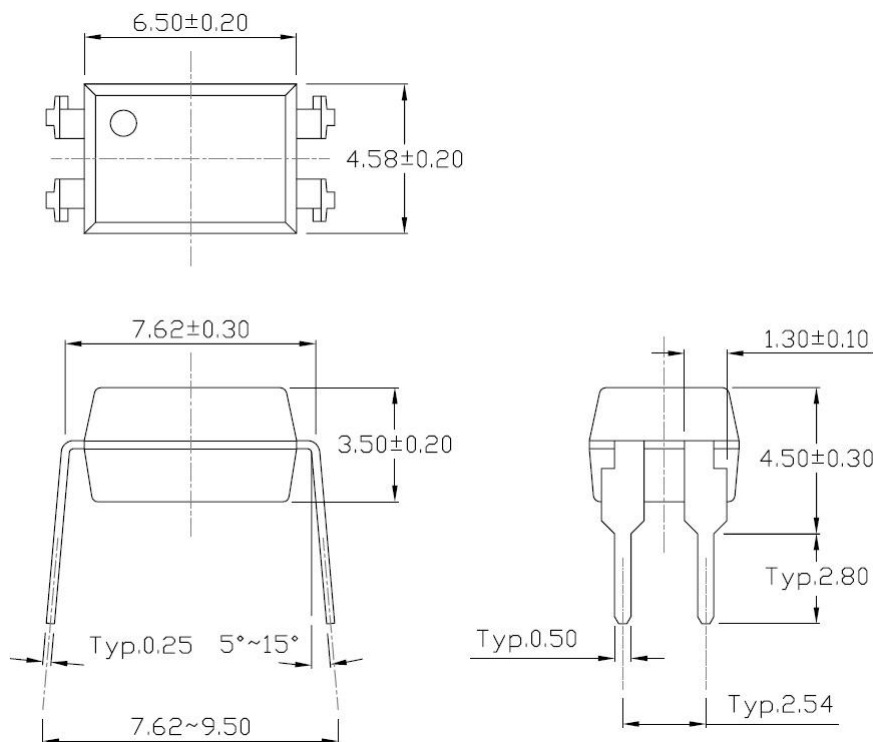


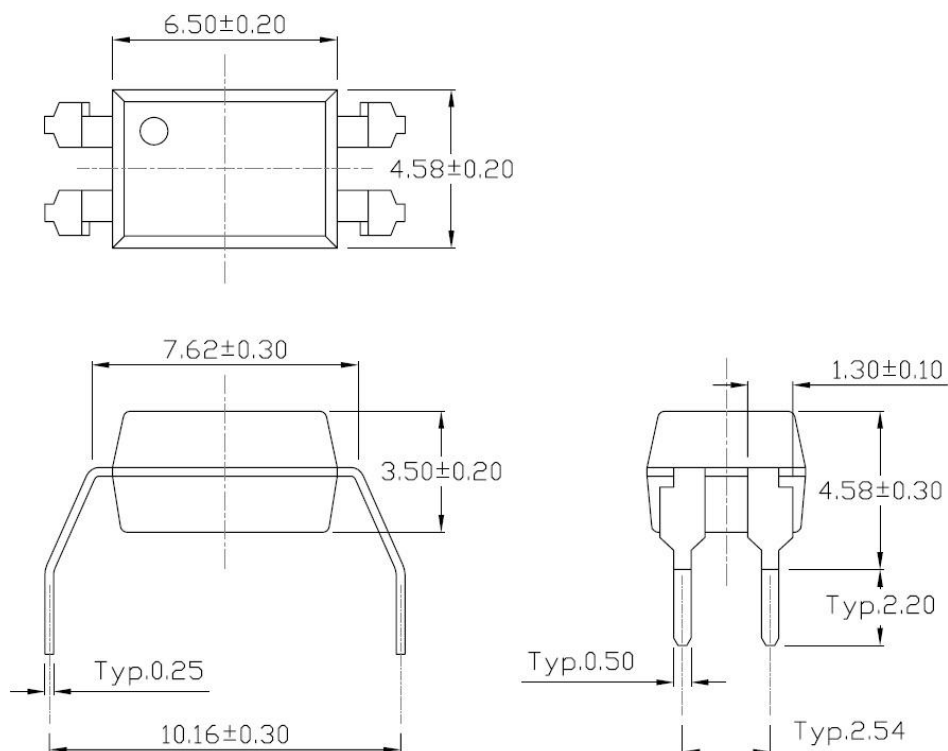
Fig.14 Test Circuits of Frequency Response

PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Standard DIP – Through Hole (DIP Type)

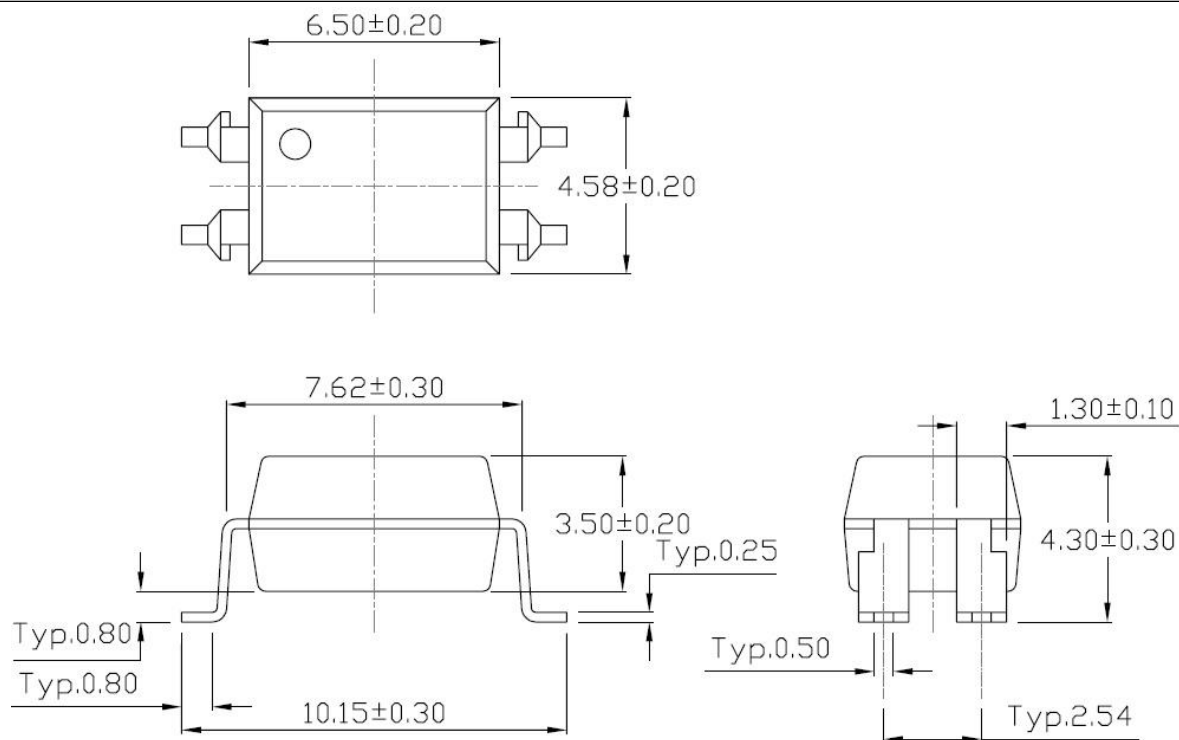


Gullwing (400mil) Lead Forming – Through Hole (M Type)

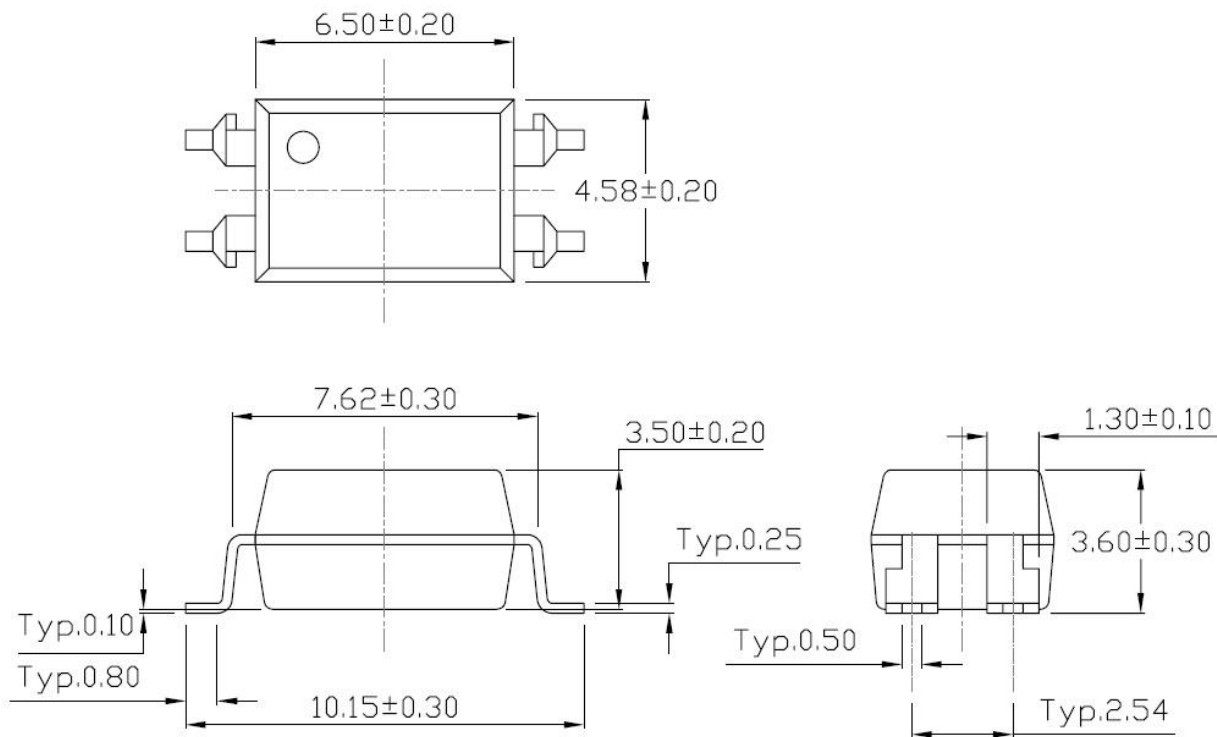


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming (S Type)

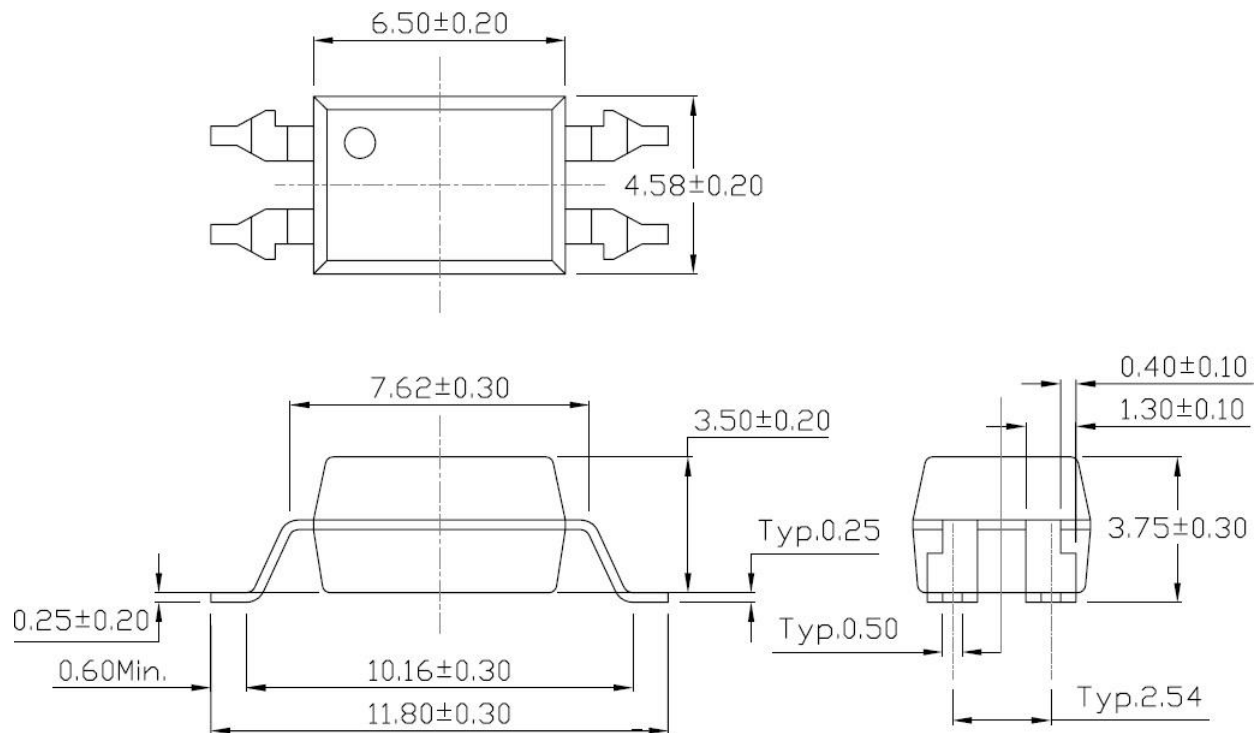


Surface Mount (Low Profile) Lead Forming (SL Type)



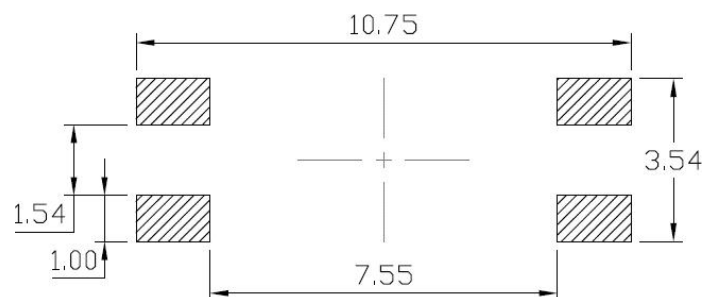
PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount (Gullwing) Lead Forming (SLM Type)

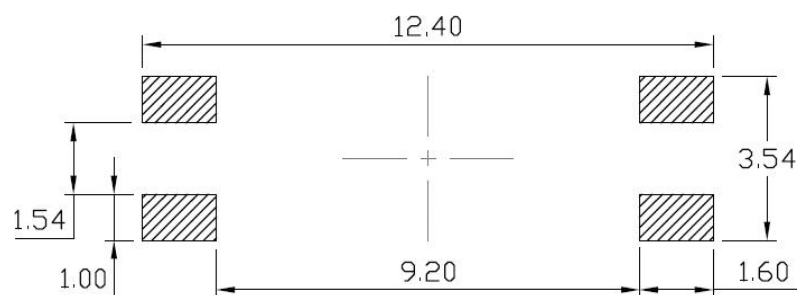


RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming

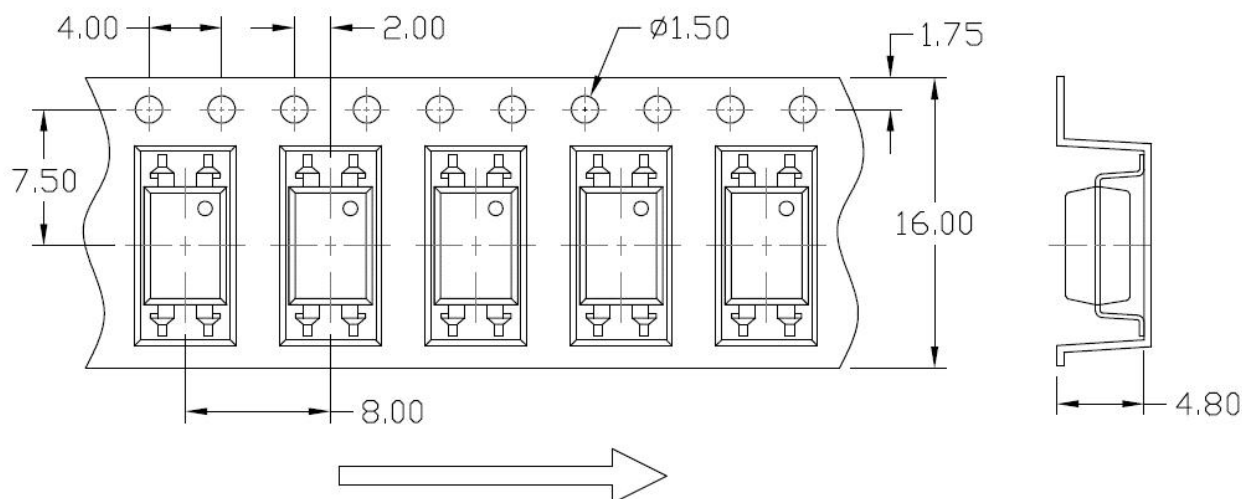


Surface Mount (Gullwing) Lead Forming

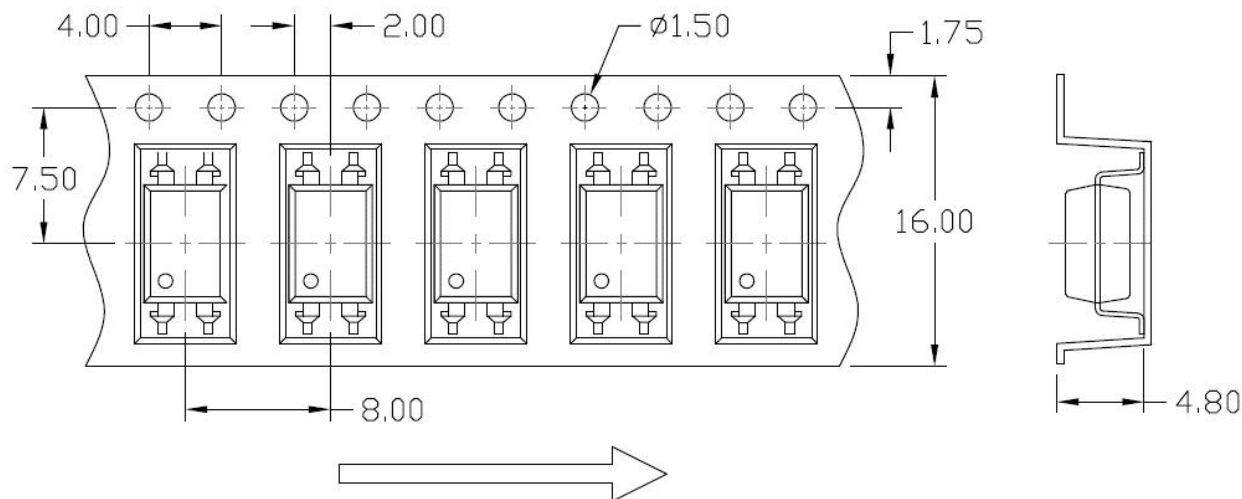


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T1) & SL(T1)

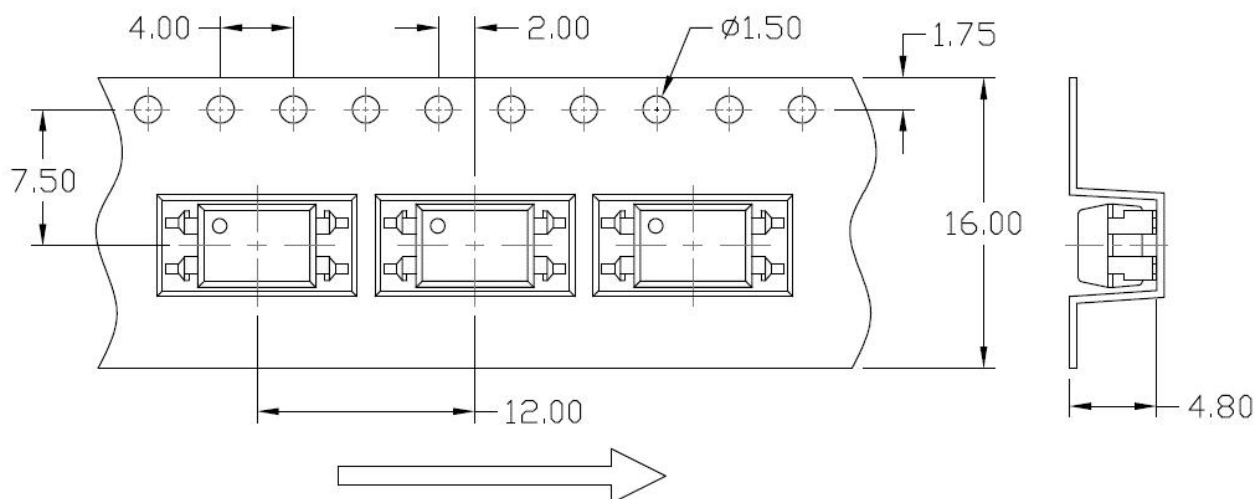


Option S(T2) & SL(T2)

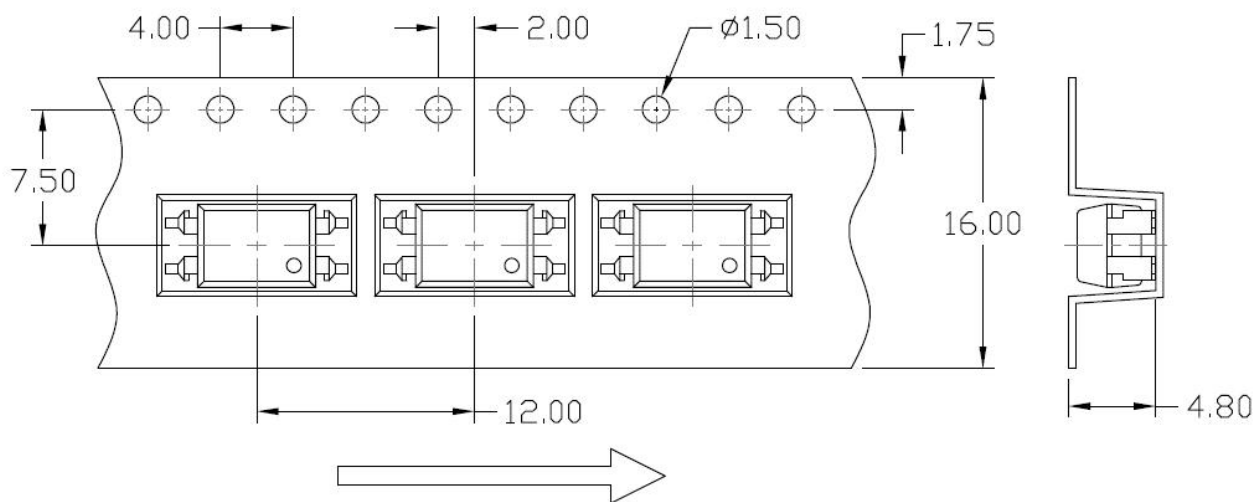


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T3) & SL(T3)

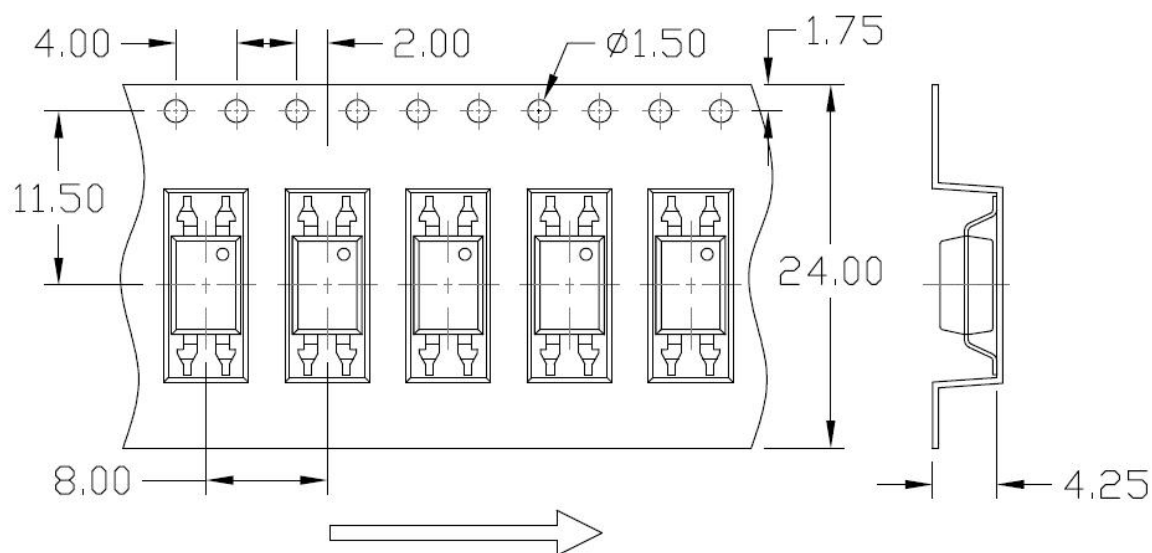


Option S(T4) & SL(T4)





Option SLM(T1)



Technical drawing of a mechanical part, showing a top view and a side view.

Top View Dimensions:

- Overall width: 4.00
- Distance between hole centers: 2.00
- Distance from right edge to hole center: 1.75
- Overall height: 11.50
- Distance from bottom edge to hole center: 24.00
- Distance from left edge to slot center: 8.00

Hole and Slot Details:

- Hole diameter: $\varnothing 1.50$
- Five rectangular slots are located below the holes.

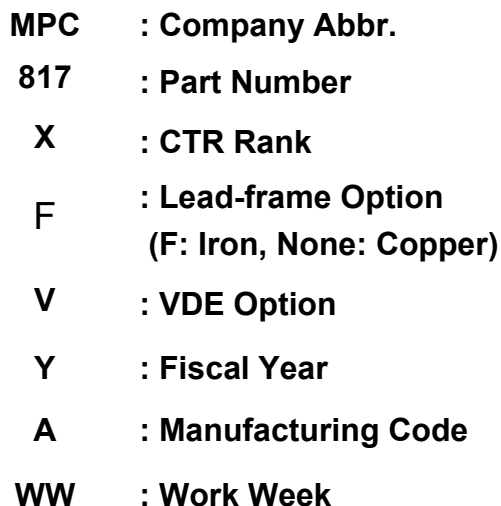
Side View Dimensions:

- Overall width: 4.25

A large arrow indicates the direction of flow or assembly.



MARKING INFORMATION



MPC817XN(Y)(Z)-FGV

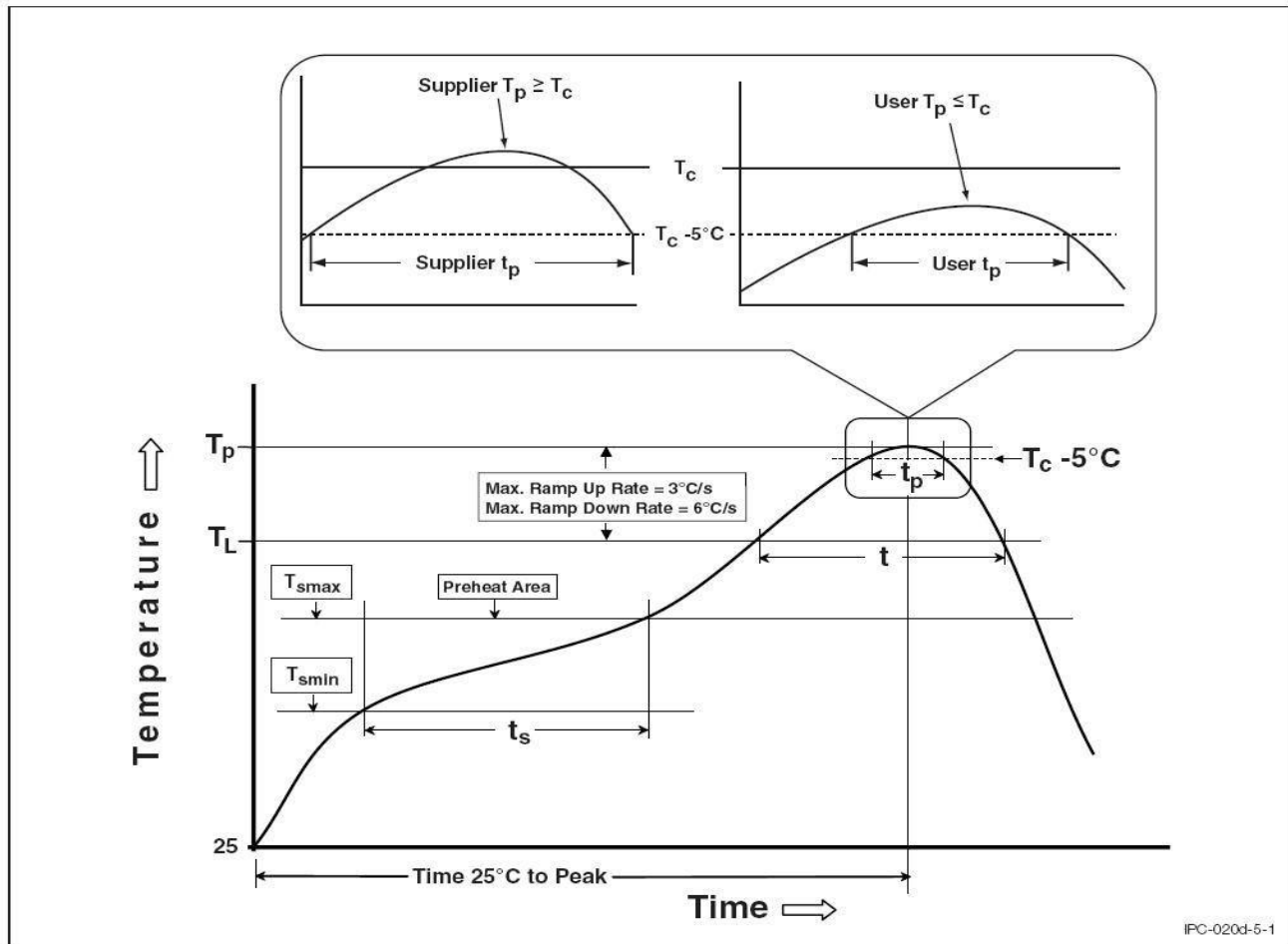
MPC— Company Abbr.	(Y) – Lead Form Option (M/S/SL/SLM/None)
817 – Part Number	(Z) – Tape and Reel Option (T1/T2/T3/T4)
XN – Rank (A/A1/B/B9/C/C1/D/D1 or None)	F – Lead-frame Option (F: Iron, None: Copper)
	G – Green
	V – VDE Option (V or None)

Packing Quantity

Option	Description	Quantity
None	Standard 4 Pin Dip	100 Units/Tube
M	Gullwing (400mil) Lead Forming	100 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1500 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1500 Units/Reel
S(T3)	Surface Mount Lead Forming – With Option 3 Taping	1000 Units/Reel
S(T4)	Surface Mount Lead Forming – With Option 4 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1500 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1500 Units/Reel
SL(T3)	Surface Mount (Low Profile) Lead Forming– With Option 3 Taping	1000 Units/Reel
SL(T4)	Surface Mount (Low Profile) Lead Forming – With Option 4 Taping	1000 Units/Reel
SLM(T1)	Surface Mount (Gullwing) Lead Forming– With Option 1 Taping	1500 Units/Reel
SLM(T2)	Surface Mount (Gullwing) Lead Forming – With Option 2 Taping	1500 Units/Reel

REFLOW INFORMATION

REFLOW PROFILE



IPC-020d-5-1

Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	100	150°C
Temperature Max. (T_{smax})	150	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.	3°C/second max.
Liquidous Temperature (T_L)	183°C	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (t_P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.



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DISCLAIMER

- Our company is continually improving the quality, reliability, function and design. Our company reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
- This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Immerge unit's body in solder paste is not recommended.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.

■ Revision History

Version	Date	Subjects (major changes since last revision)
1.0	2018-12-21	Datasheet Complete
1.1	2020-03-28	Upgrade Datasheet
1.2	2022-03-03	Revise Tr and Tf Typical Values
1.3	2022-10-28	Revise Marking Information
1.4	2023-07-05	Upgrade Datasheet