

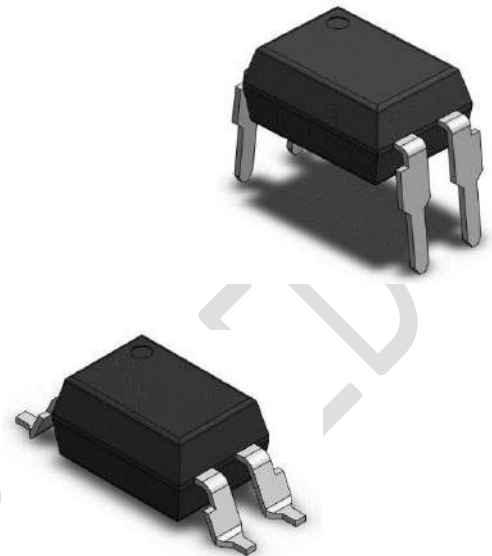
Specification for APC-817 Series

APC-817

DIP4, DC Input, Photo Transistor Coupler

The APC-817 series combines 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, APC-817 series provide the most stable isolation feature.



Features:

- High isolation V_{rms} : 5000V
- CTR flexibility available
- DC input with transistor output
- Operating temperature: - 55 °C to 110 °C
- RoHS & REACH Compliance
- MSL Class 1
- Halogen free (Optional)
- UL - UL1577
- VDE - EN60747-5-5(VDE0884-5)
- CQC - GB4943.1, GB8898
- cUL- CSA Component Acceptance Service Notice No. 5A

Applications:

- Switch mode power supplies
- Programmable controllers
- Household appliances
- Office equipment

Schematic Diagram	PIN Definition
	1. Anode 2. Cathode 3. Emitter 4. Collector

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}	-55~125	°C	
Soldering Temperature	T_{sol}	260	°C	

Note 1. 100μs pulse, 100Hz frequency

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

Electrical Optical Characteristics at T _a =25°C							
Parameter	Symbol	min	Typ.	Max.	unit	Test Condition	Note
Input							
Forward Voltage	V _F	-	1.24	1.4	V	I _F =10mA	
Reverse Current	I _R	-	-	10	μA	V _R =6V	
Input Capacitance	C _{in}	-	10	-	pF	V=0, f=1kHz	
Output							
Collector Dark Current	I _{CEO}	-	-	100	nA	V _{EC} =20V, I _F =0	
Collector – Emitter Breakdown Voltage	BV _{CEO}	35	-	-	V	I _C =0.1mA, I _F =0	
Emitter – Collector Breakdown Voltage	BV _{ECO}	6	-	-	V	I _E =0.1mA, I _F =0	
Transfer Characteristics							
Current Transfer Ratio	APC-817A1	CTR	80	-	160	I _F =5mA, V _{CE} =5V	5
	APC-817B1		130	-	260		
	APC-817C1		200	-	400		
	APC-817D1		300	-	600		
Collector – Emitter Saturation Voltage	V _{CE(sat)}	-	0.06	0.2	V	I _F =20mA, I _C =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	
Response Time (rise)	T _r	-	3	18	μs	V _{CE} =2V, I _C =2mA	3
Response Time (fall)	T _f	-	4	18	μs	RL=100Ω	3
Cut-off Frequency	f _c	-	80	-	kHz	V _{CE} =2V, I _C =2mA RL=100Ω, -3dB	4

Note 3. Fig.12&13

Note 4. Fig.14

Note 5. CTR Value varies for each rank

Naming System:

APC-817A1-SL

A1: Indicated to the CTR value listed on Page 3 (A1/B1/C1/D1)

S: Indicated to the PIN type listed on Page 7 to Page 9 (None/M/S/SL/SML)

Characteristic Curves

Fig 1. Forward Current vs. Ambient Temperature

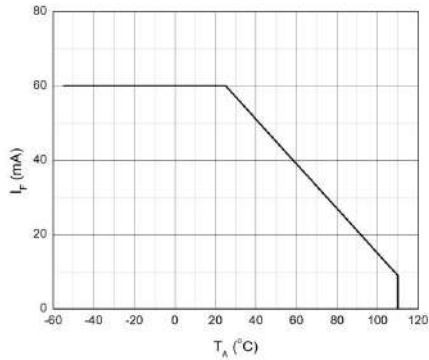


Fig 2. Collector Power Dissipation vs. Ambient Temperature

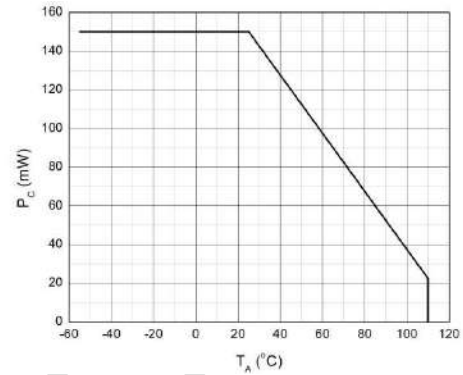


Fig 3. Forward Current vs. Forward Voltage

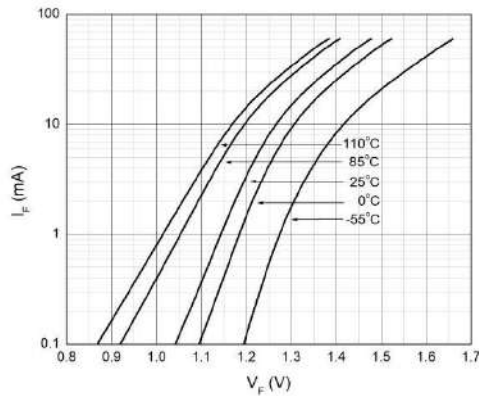


Fig 4. Collector Dark Current vs. Ambient Temperature

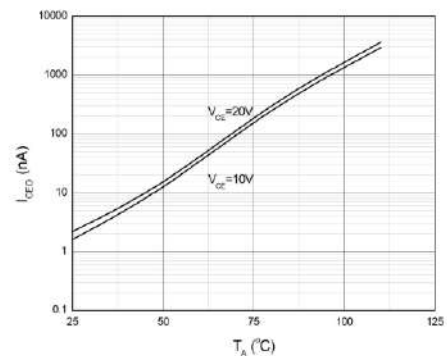


Fig 5. Collector Current vs. Collector-emitter Voltage

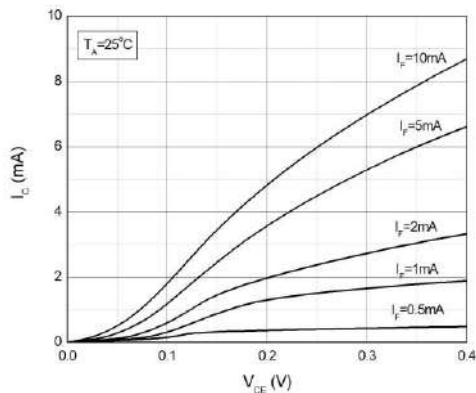


Fig 6. Collector Current vs. Collector-emitter Voltage

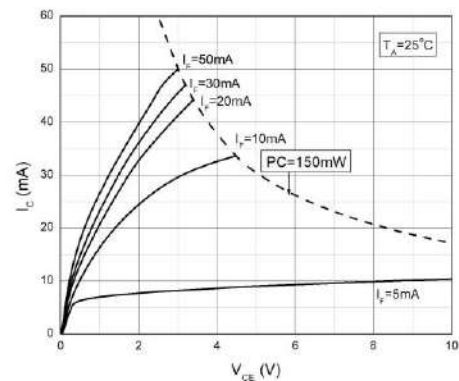


Fig 7. Normalized Current Transfer Ratio vs. Forward Current

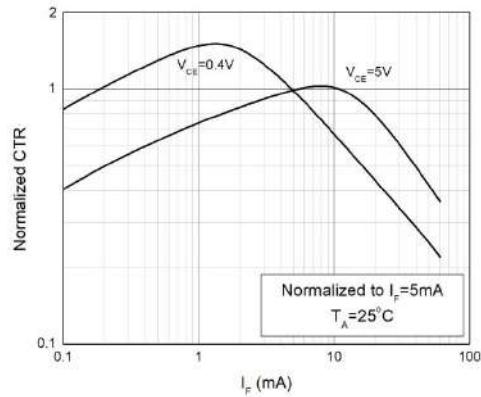


Fig 8. Normalized Current Transfer Ratio vs. Ambient Temperature

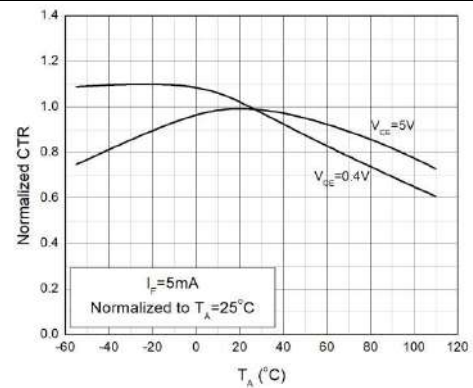


Fig 9. Collector-emitter Saturation Voltage vs. Ambient Temperature

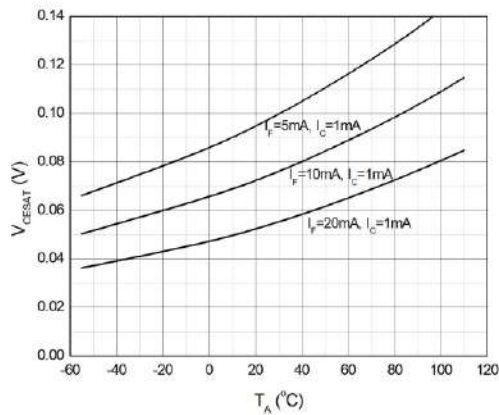


Fig 10. Switching Time vs. Load Resistance

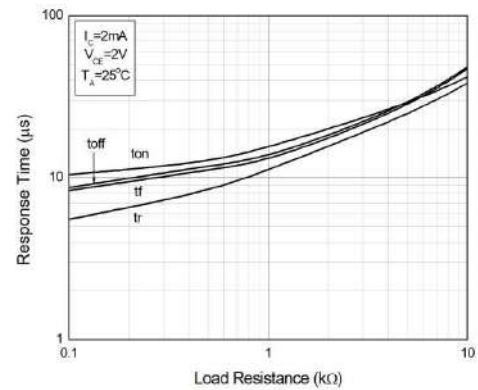


Fig 11. Frequency Response

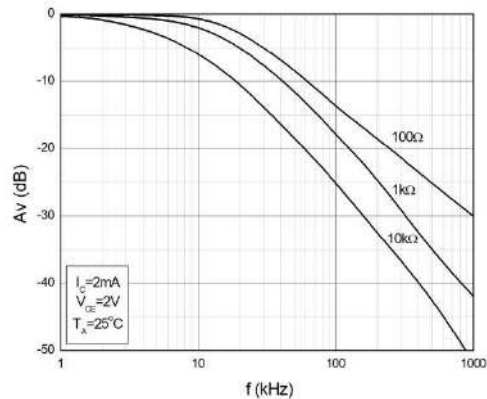
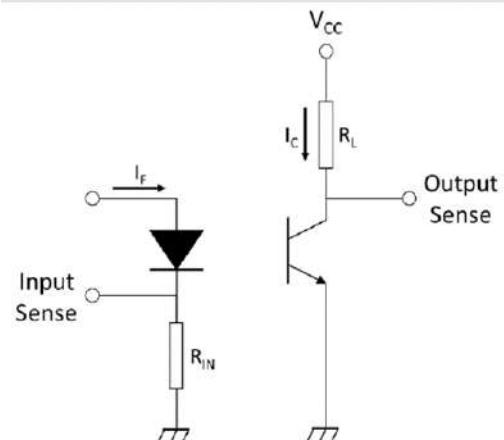
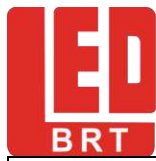


Fig 12. Test Circuits of Response Time





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Fig 13. Curves of Response Time

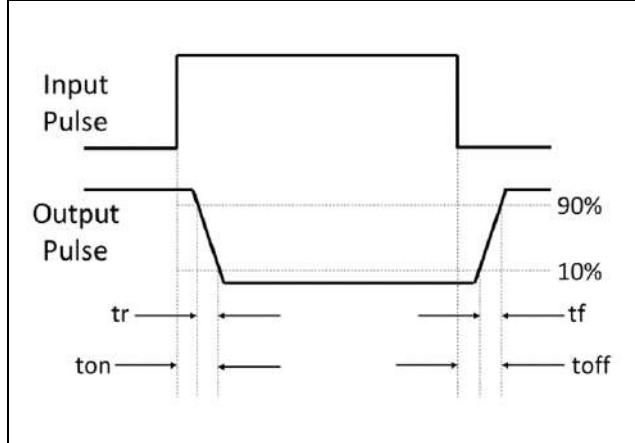
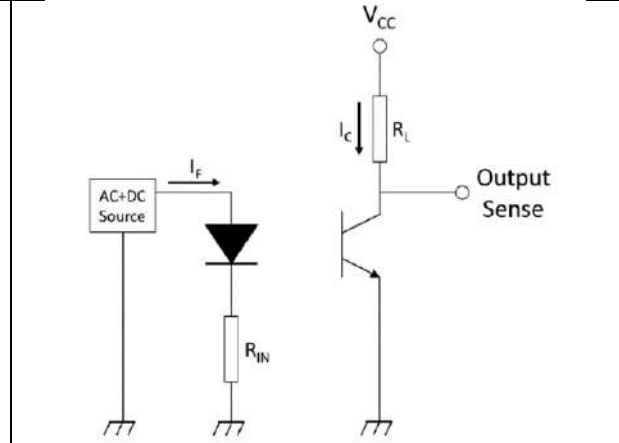
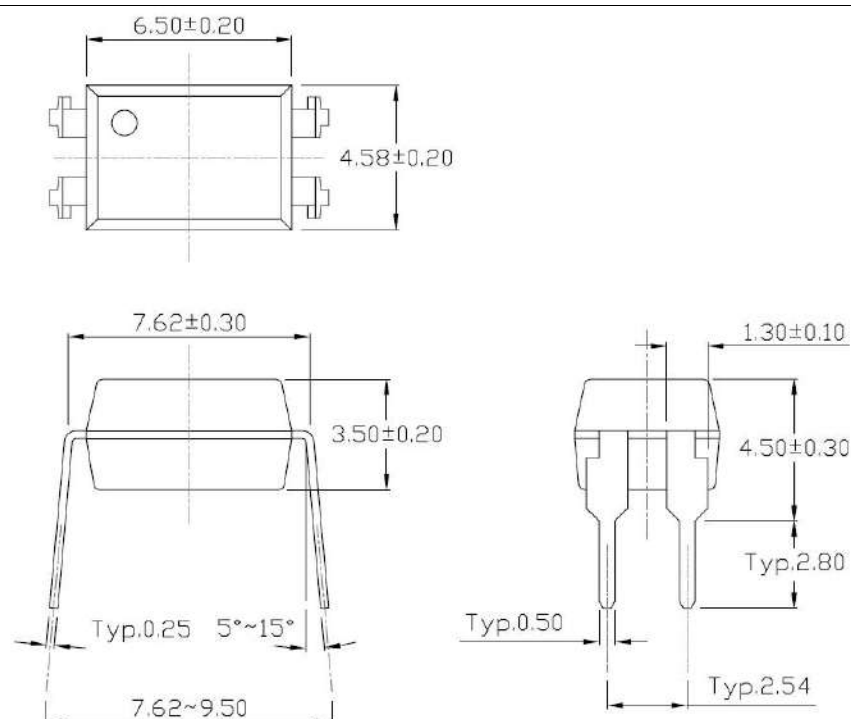
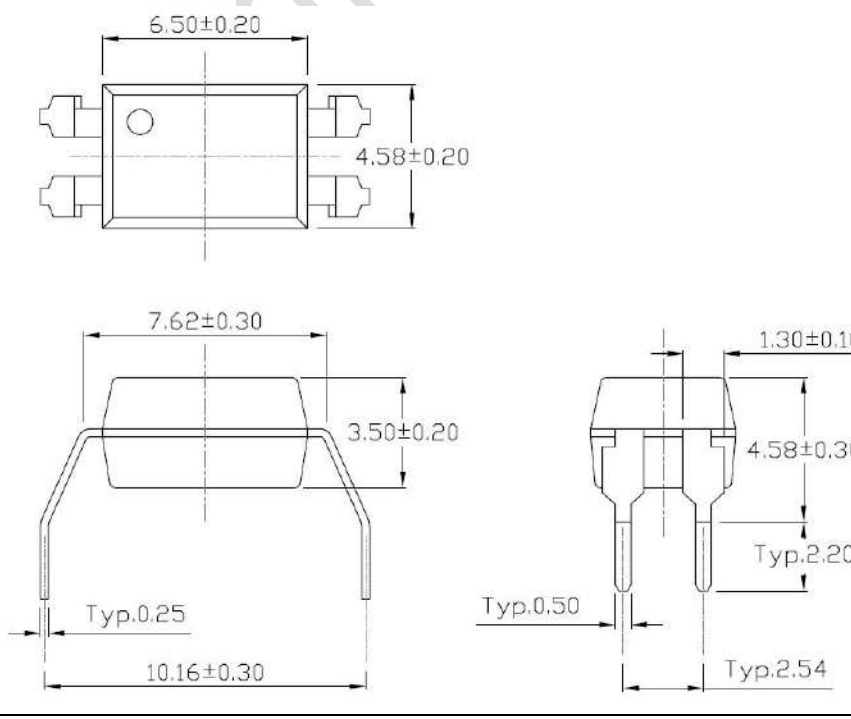
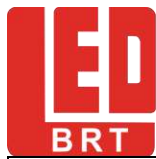


Fig 14. Test Circuits of Frequency Response

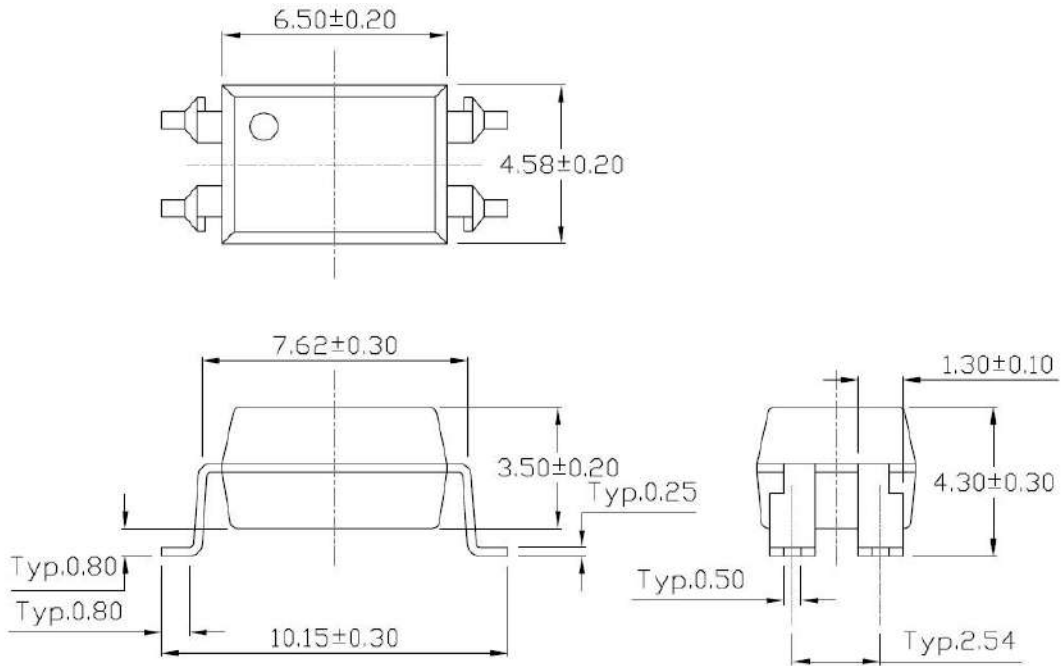


Package Dimension (mm)	
Standard DIP – Through hole (DIP Type) – APC-817xx	
 Top view dimensions: 6.50 ± 0.20 (width), 4.58 ± 0.20 (height). Side view dimensions: 7.62 ± 0.30 (top width), 3.50 ± 0.20 (body height), $7.62 \sim 9.50$ (lead length), $\text{Typ.} 0.25$ (lead thickness), $5^\circ \sim 15^\circ$ (lead angle). End view dimensions: 1.30 ± 0.10 (lead spacing), 4.50 ± 0.30 (body height), $\text{Typ.} 2.80$ (lead length), $\text{Typ.} 0.50$ (lead thickness), $\text{Typ.} 2.54$ (lead pitch).	
Gullwing (400mil) Lead Forming – Through Hole (M Type) – APC-817xx-M	
 Top view dimensions: 6.50 ± 0.20 (width), 4.58 ± 0.20 (height). Side view dimensions: 7.62 ± 0.30 (top width), 3.50 ± 0.20 (body height), 10.16 ± 0.30 (lead length), $\text{Typ.} 0.25$ (lead thickness). End view dimensions: 1.30 ± 0.10 (lead spacing), 4.58 ± 0.30 (body height), $\text{Typ.} 2.20$ (lead length), $\text{Typ.} 0.50$ (lead thickness), $\text{Typ.} 2.54$ (lead pitch).	

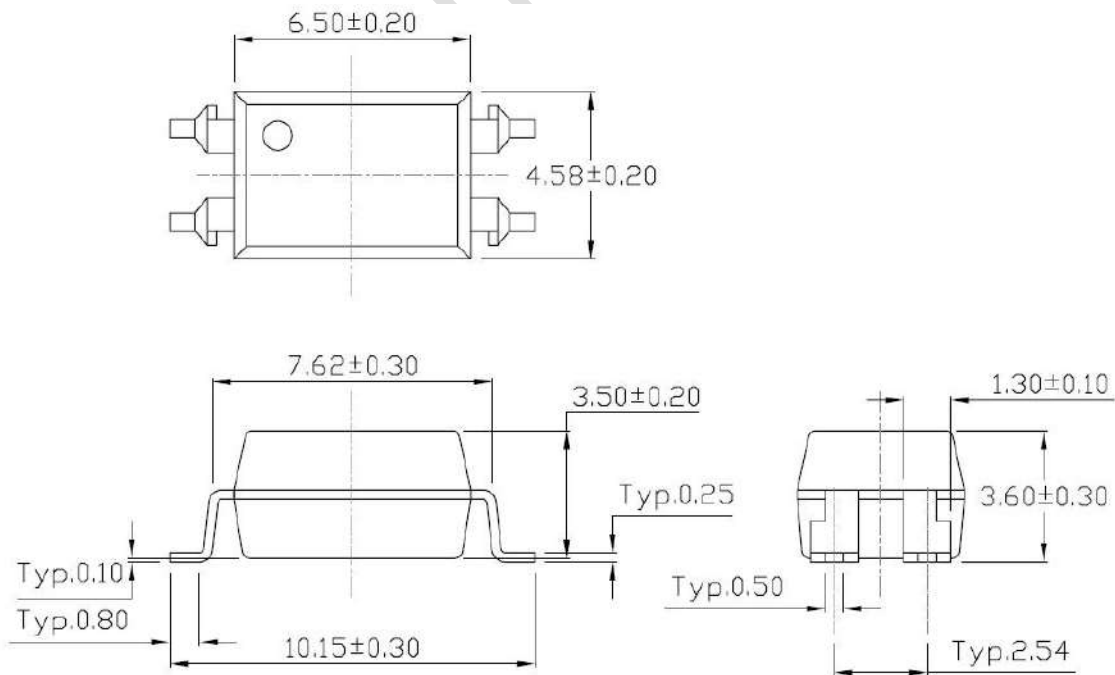


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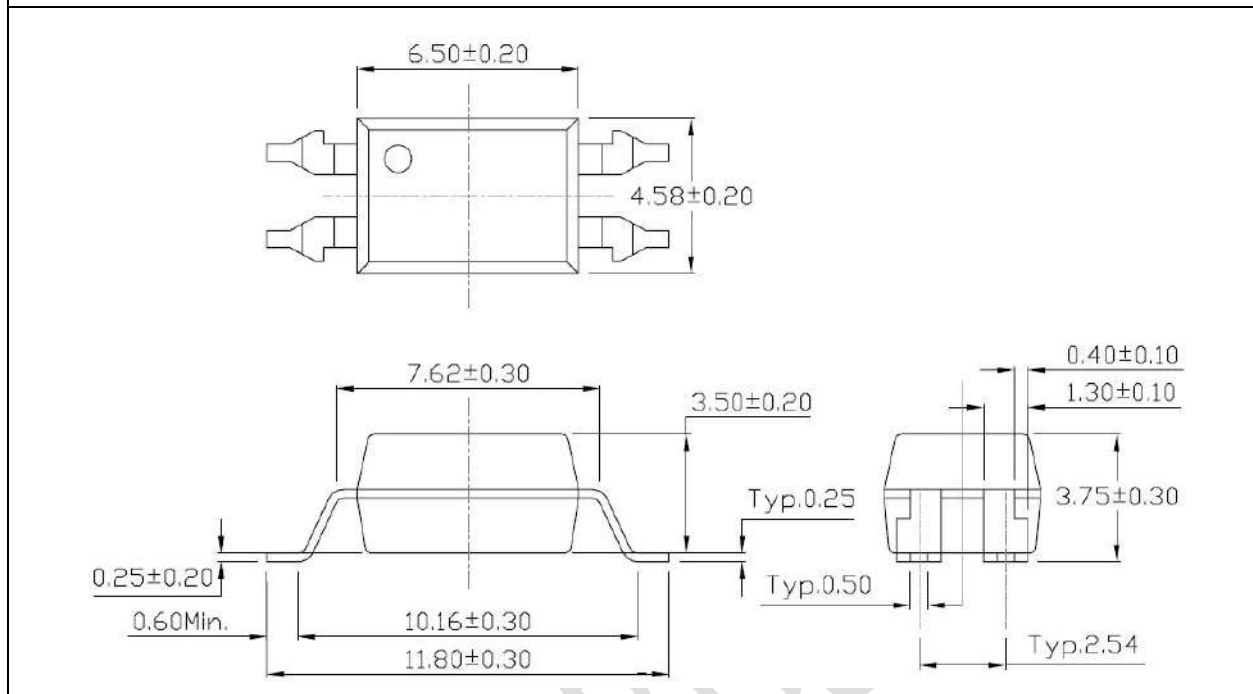
Surface Mount Lead Forming (S Type) – APC817xx-S



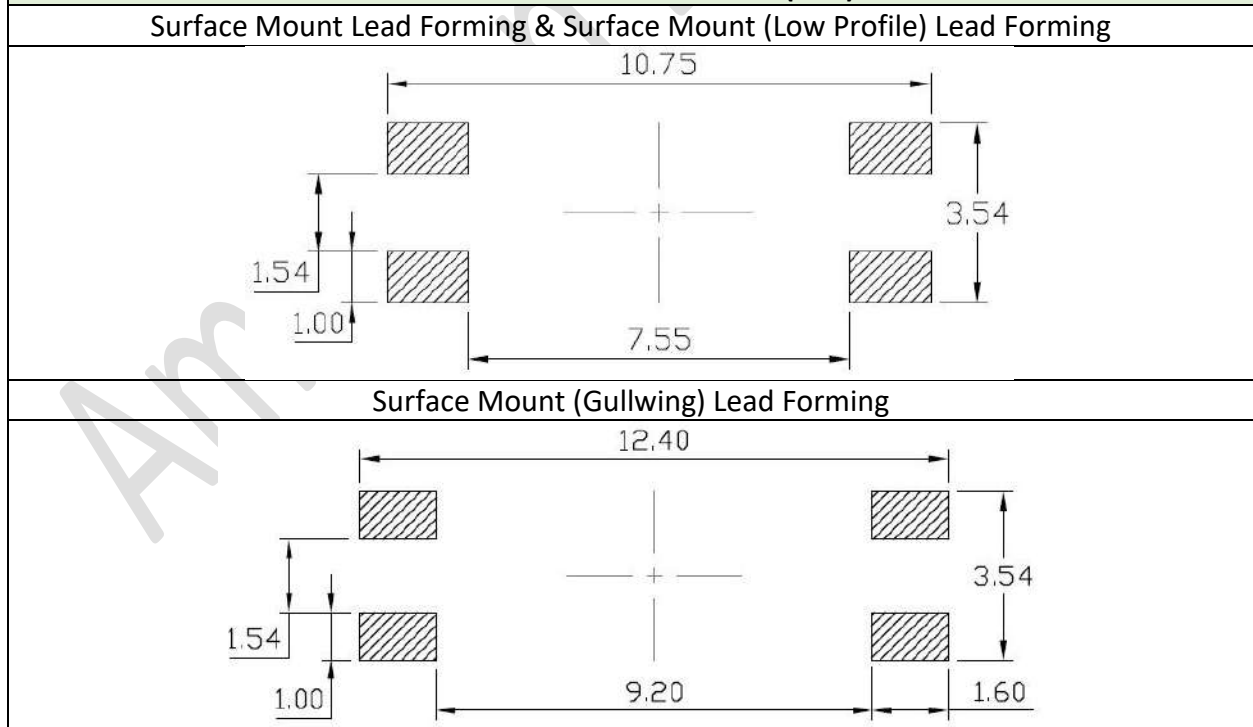
Surface Mount (Low Profile) Lead Forming (SL Type) - APC-817xx-SL

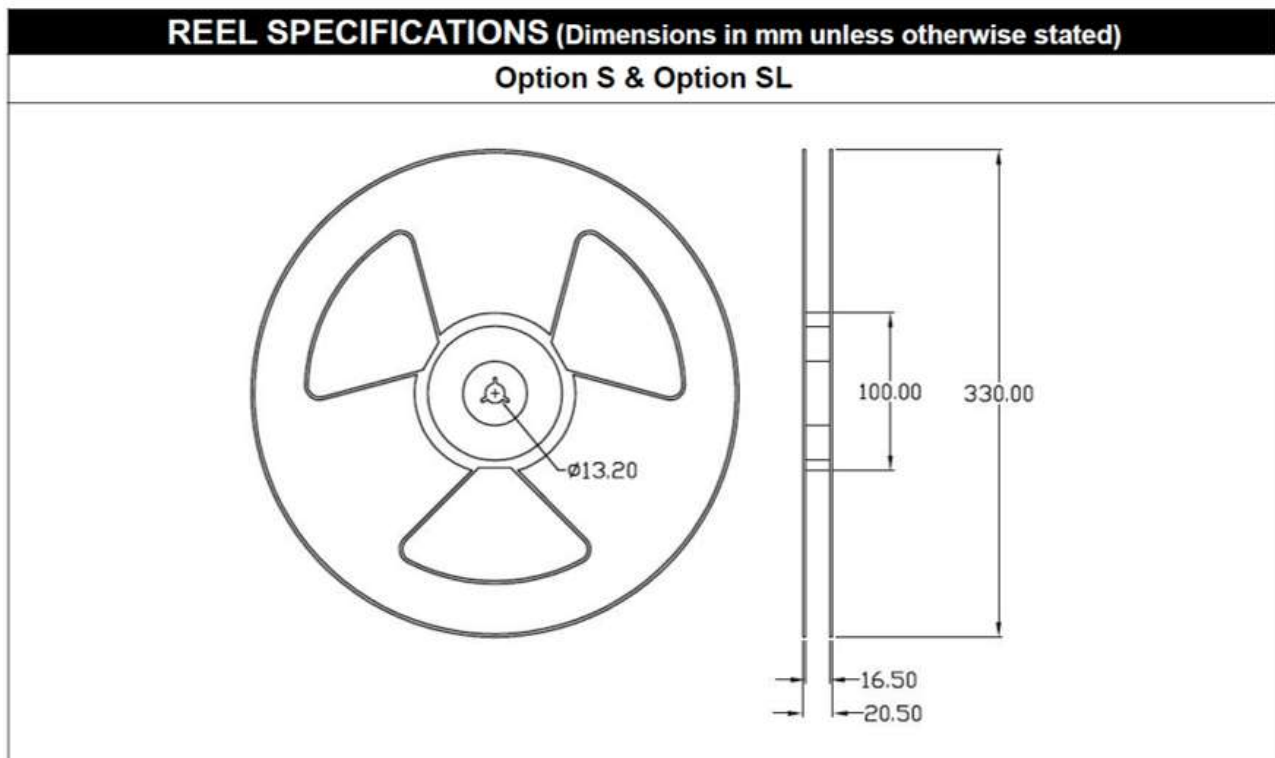
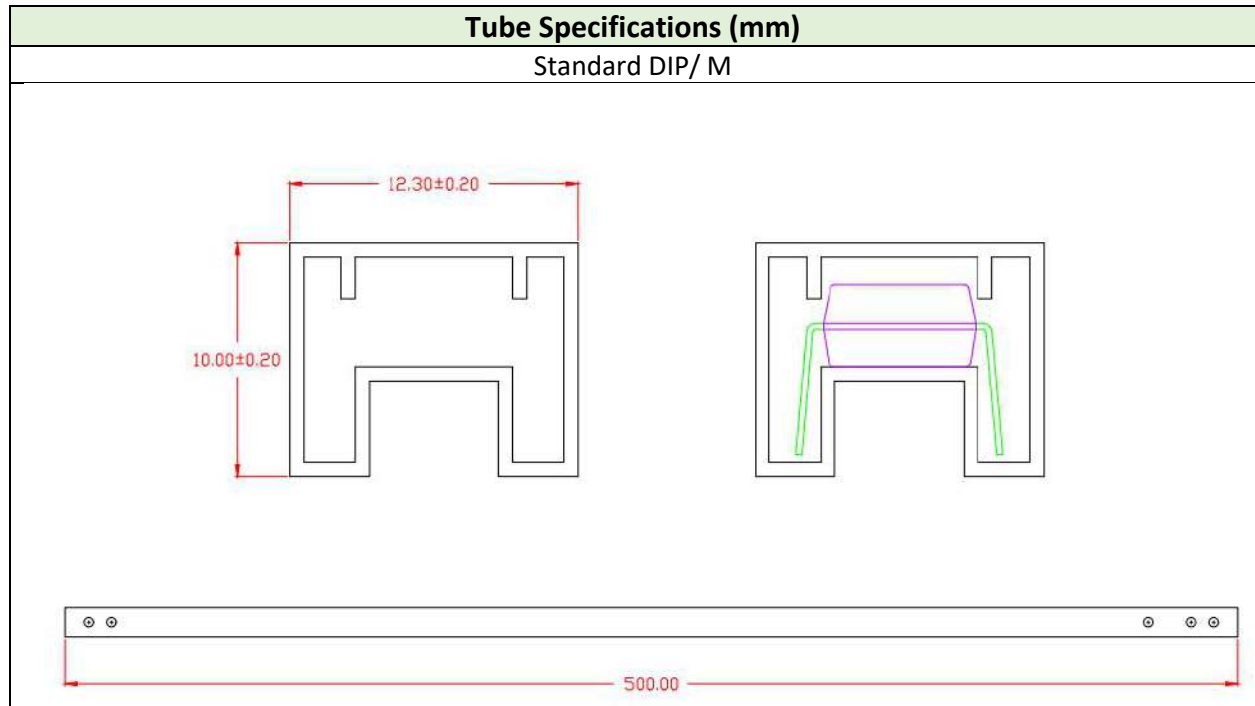


Surface Mount (Gullwing) Lead Forming (SLM Type) - APC-817xx-SLM



Recommended Solder Mask (mm)

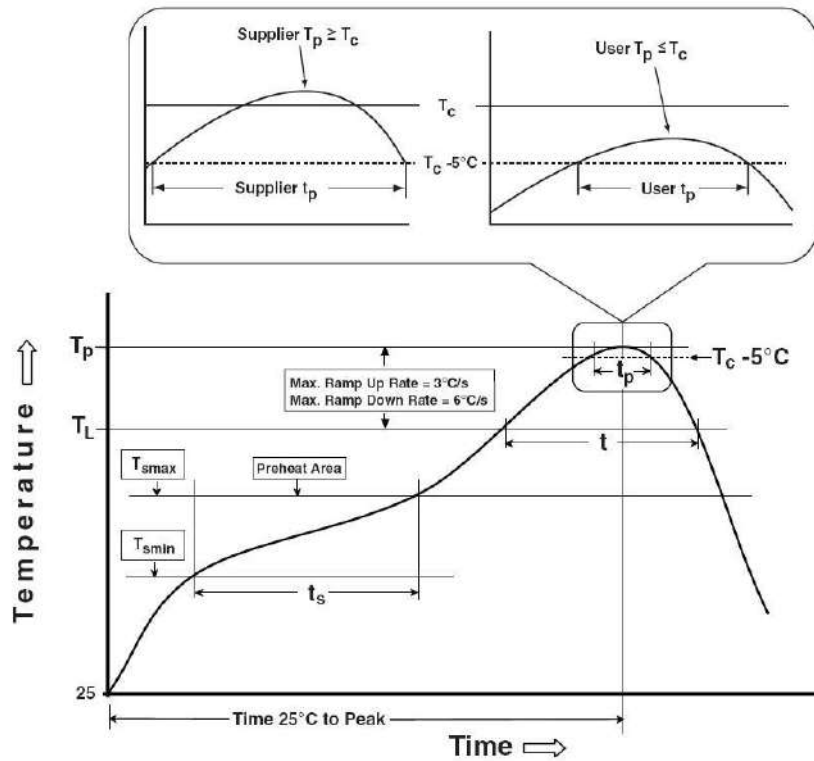




*1500 pcs per reel

Reflow Information

Reflow Profile



Profile Feature	Sn-Pb Assembly Profile	Pb-free Assembly Profile
Temperature min. ($T_{s,min}$)	100°C	150°C
Temperature Max. ($T_{s,Max}$)	150°C	200°C
Time (t_s) from ($T_{s,min}$ to $T_{s,max}$)	60-120 s	60-120 s
Ramp-up Rate (t_L to t_P)	3°C/s max.	3°C/s max.
Liquidous Temperature (T_L)	183°C	217°C
Time (t_L) Maintained Above (T_L)	60-150 s	60-150 s
Peak Body Package Temperature	230°C +0°C/ -5°C	260°C +0°C/ -5°C
Time (t_P) within 5°C of 260°C	20 s	30 s
Ramp-down Rate (T_P to T_L)	6°C/s max.	6°C/s max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

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