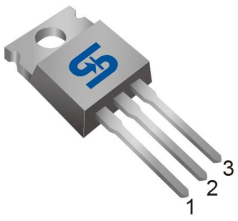
TAIWAN SEMICONDUCTOR

TSM480P06

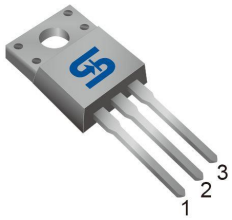
60V P-Channel Power MOSFET

Pb-Free RoHS COMPLIANT

TO-220



ITO-220

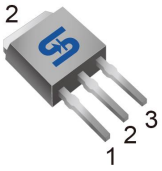


Pin Definition:
1. Gate
2. Drain
3. Source

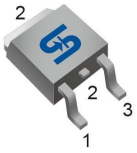
Key Parameter Performance

Parameter		Value	Unit
V_{DS}		-60	V
$R_{DS(on)}$ (max)	V_{GS} = -10V	48	mq
	V_{GS} = -4.5V	65	
Q_g		22.4	nC

TO-251S (IPAK)



TO-252 (DPAK)

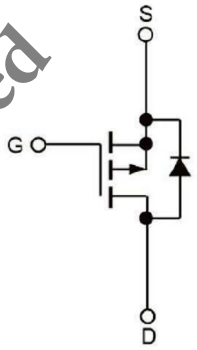


Ordering Information

Part No.	Package	Packing
TSM480P06CZ C0G	TO-220	50pcs / Tube
TSM480P06CI C0G	ITO-220	50pcs / Tube
TSM480P06CH X0G	TO-251S	75pcs / Tube
TSM480P06CP ROG	TO-252	2.5kpcs / 13è Reel

Note: ñGòdenotes for Halogen- and Antimony-free as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds

Block Diagram



P-Channel MOSFE

Absolute Maximum Ratings (Tc = 25°C unless otherwise noted)

Parameter		Symbol	Limit			Unit
			IPAK/DPAK	ITO-220	TO-220	
Drain-Source Voltage		V_{DS}	-60			V
Gate-Source Voltage		V_{GS}	±20			V
Continuous Drain Current (Note 1)	Tc = 25°C	I_D	-20			A
	Tc = 100°C		-13			A
Pulsed Drain Current (Note 2)		I_{DM}	-64			A
Single Pulse Avalanche Energy (Note 3)		E_{AS}	51			mJ
Single Pulse Avalanche Current (Note 2)		I_{AS}	-32			A
Power Dissipation @ T_C = 25°C		P_D	40	27	66	W
Operating Junction Temperature		T_J	-50 to +150			°C
Storage Temperature Range		T_{STG}	-50 to +150			°C

TSM480P06

60V P-Channel Power MOSFET

Thermal Performance

Parameter	Symbol	Limit			Unit
		IPAK/DPAK	ITO-220	TO-220	
Thermal Resistance - Junction to Case	$R_{\theta JC}$	3.1	4.7	1.9	°C/W
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	62			°C/W

Electrical Specifications (T_C = 25°C unless otherwise noted)

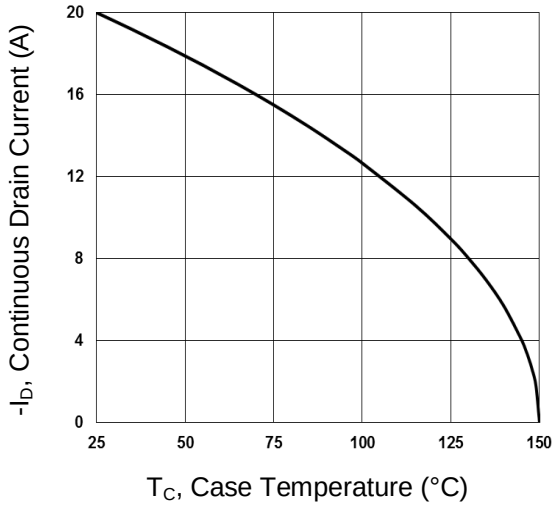
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	BV_{DSS}	-60	--	--	V
Drain-Source On-State Resistance	V_{GS} = -10V, I_D = -8A	$R_{DS(ON)}$	--	39	48	mq
	V_{GS} = -4.5V, I_D = -4A			53	65	
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	$V_{GS(TH)}$	-1.2	-1.6	-2.2	V
Zero Gate Voltage Drain Current	V_{DS} = -60V, V_{GS} = 0V	I_{DSS}	--	--	-1	μA
	V_{DS} = -48V, Tc = 125°C		--	--	-10	
Gate Body Leakage	V_{GS} = ±20V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Forward Transconductance (Note 4)	V_{DS} = -10V, I_D = -8A	g_{fs}	--	10	--	S
Dynamic						
Total Gate Charge (Note 4,5)	V_{DS} = -30V, I_D = -8A, V_{GS} = -10V	Q_g	--	22.4	--	nC
Gate-Source Charge (Note 4,5)		Q_{gs}	--	4.1	--	
Gate-Drain Charge (Note 4,5)		Q_{gd}	--	5.2	--	
Input Capacitance	V_{DS} = -30V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	1250	--	pF
Output Capacitance		C_{oss}	--	85	--	
Reverse Transfer Capacitance		C_{rss}	--	65	--	
Switching						
Turn-On Delay Time (Note 4,5)	V_{DD} = -30V, I_D = -1A, R_{GEN} =6q	$t_{d(on)}$	--	13	--	ns
Turn-On Rise Time (Note 4,5)		t_r	--	42.4	--	
Turn-Off Delay Time (Note 4,5)		$t_{d(off)}$	--	64.6	--	
Turn-Off Fall Time (Note 4,5)		t_f	--	16.4	--	
Source-Drain Diode Ratings and Characteristic						
Maximum Continuous Drain-Source Diode Forward Current	Integral reverse diode in the MOSFET	I_S	--	--	-16	A
Maximum Pulse Drain-Source Diode Forward Current		I_{SM}	--	--	-64	A
Diode-Source Forward Voltage	V_{GS} = 0V, I_S = -1A	V_{SD}	--	--	-1	V

Note:

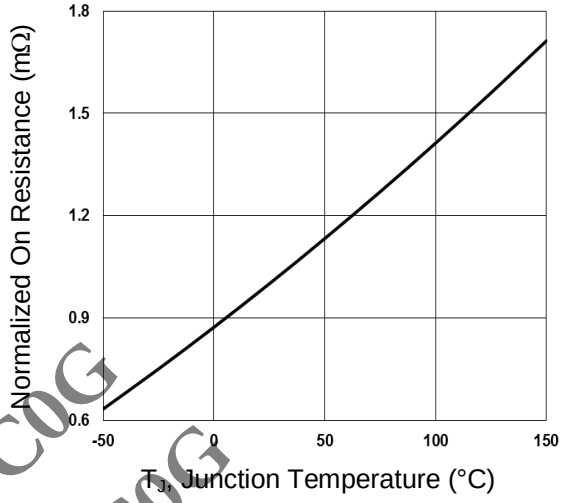
1. Limited by maximum junction temperature
2. Pulse width limited by safe operating area
3. L = 3.68mH, I_{AS} = 8A, V_{DD} = 50V, R_G = 25q , Starting T_J = 25°C
4. Pulse test: pulse width Ò300μs, duty cycle Ò2%
5. Switching time is essentially independent of operating temperature

Electrical Characteristics Curve

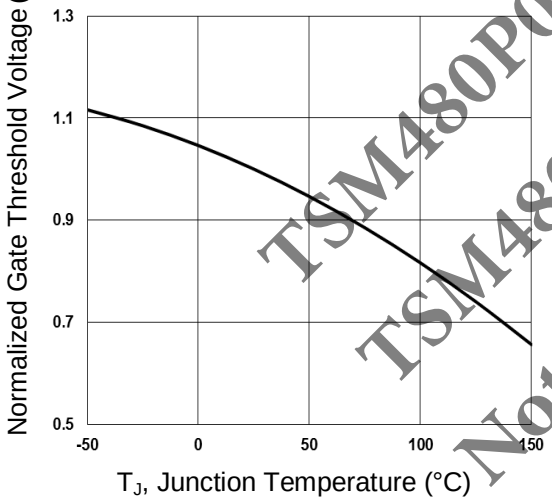
Continuous Drain Current VS. Tc



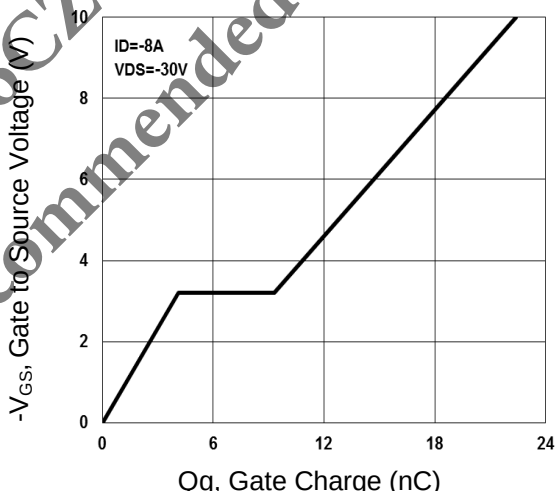
Normalized Rds(on) VS. Tj



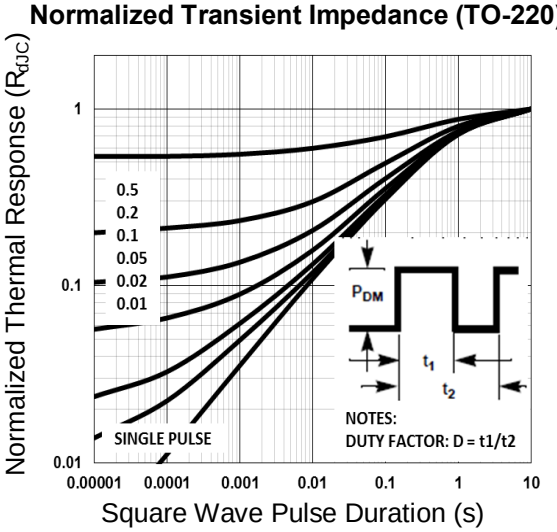
Normalized Vth VS. Tj



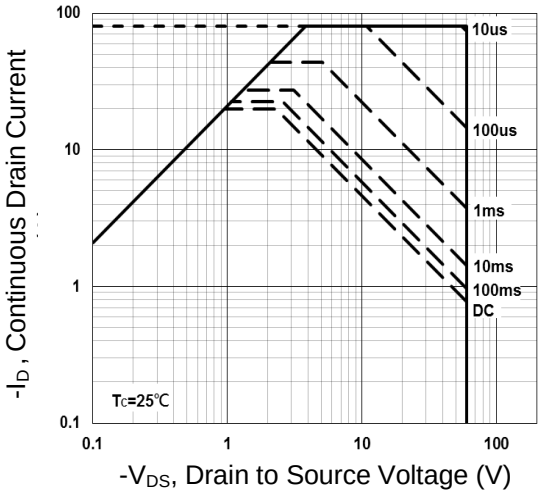
Gate Charge Waveform



Normalized Transient Impedance (TO-220)



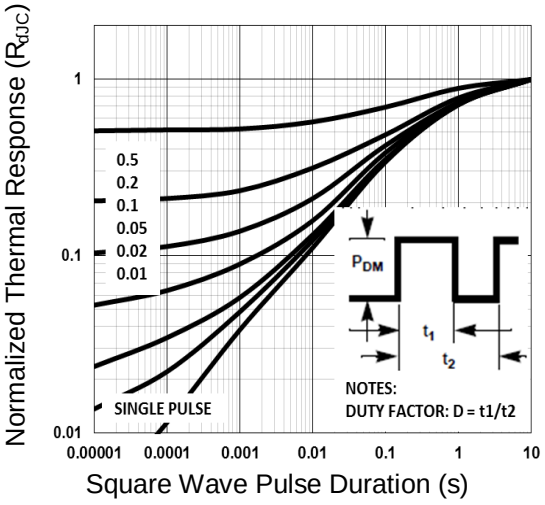
Maximum Safe Operation Area (TO-220)



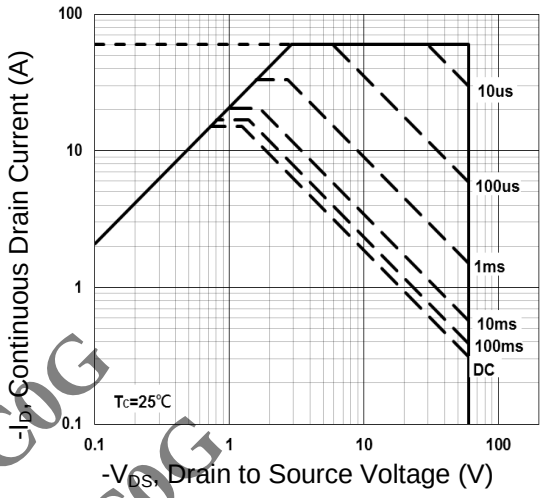
Pb-Free RoHS COMPLIANT

Electrical Characteristics Curve

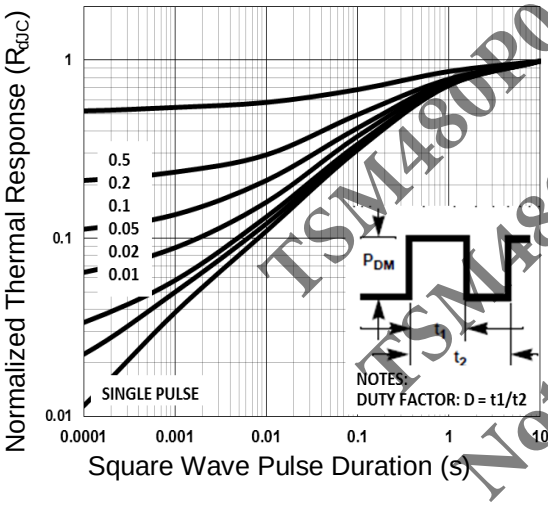
Normalized Transient Impedance (ITO-220)



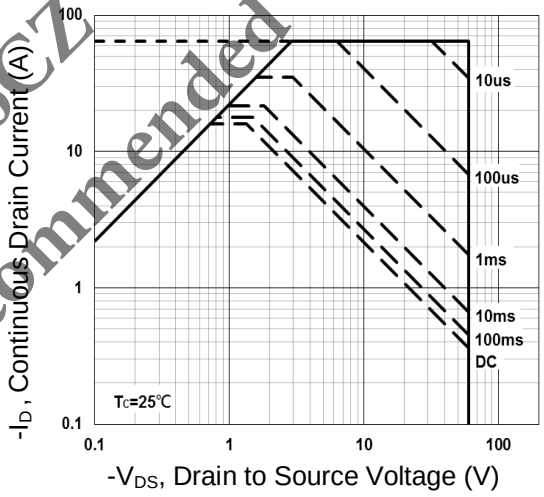
Maximum Safe Operation Area (ITO-220)



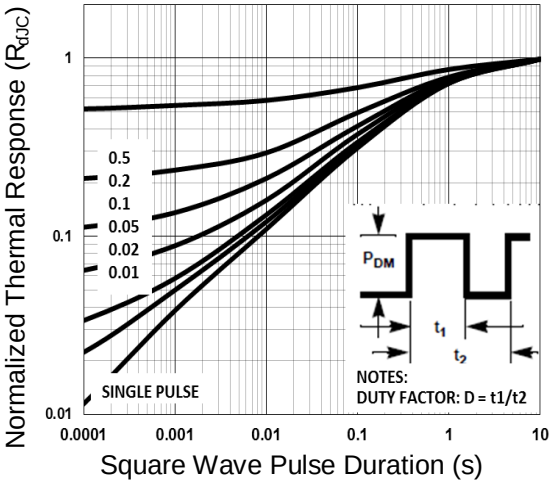
Normalized Transient Impedance (TO-251S)



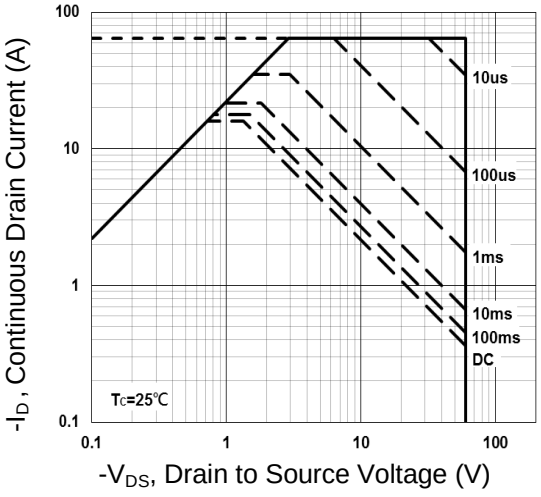
Maximum Safe Operation Area (TO-251S)



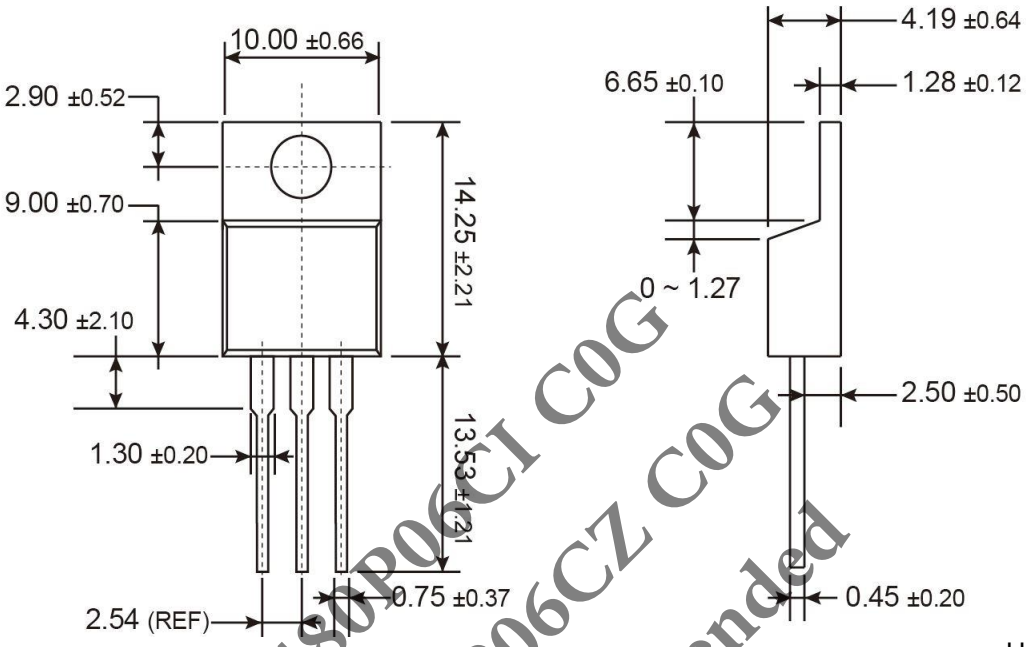
Normalized Transient Impedance (TO-252)



Maximum Safe Operation Area (TO-252)

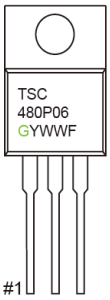


TO-220 Mechanical Drawing



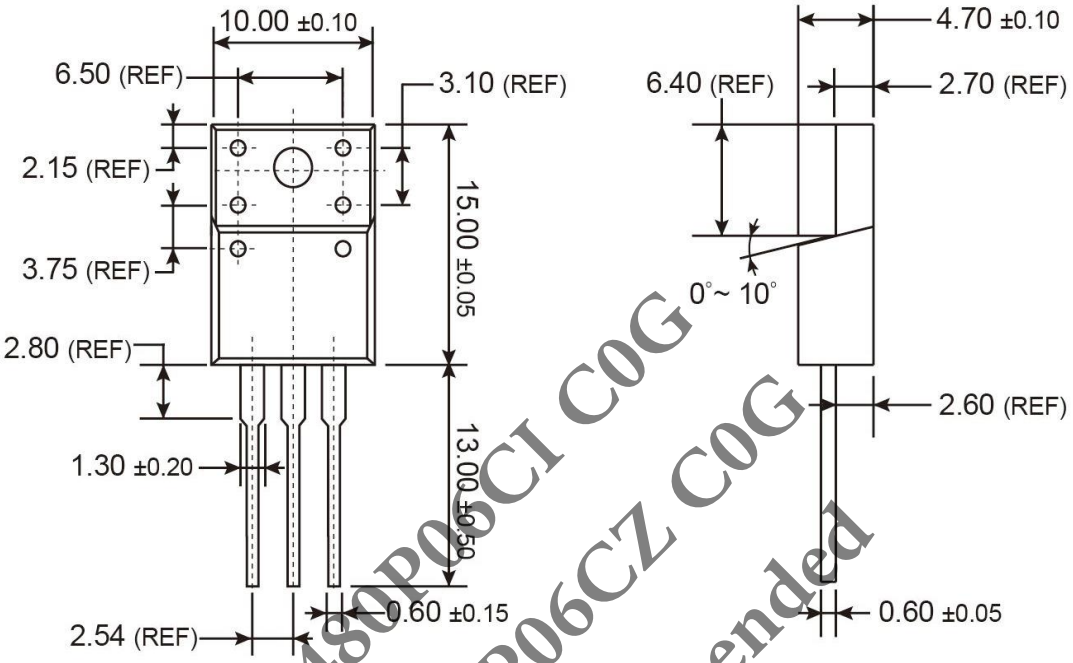
Unit: Millimeters

Marking Diagram



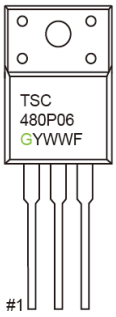
G = Halogen Free
Y = Year Code
WW = Week Code (01~52)
F = Factory Code

ITO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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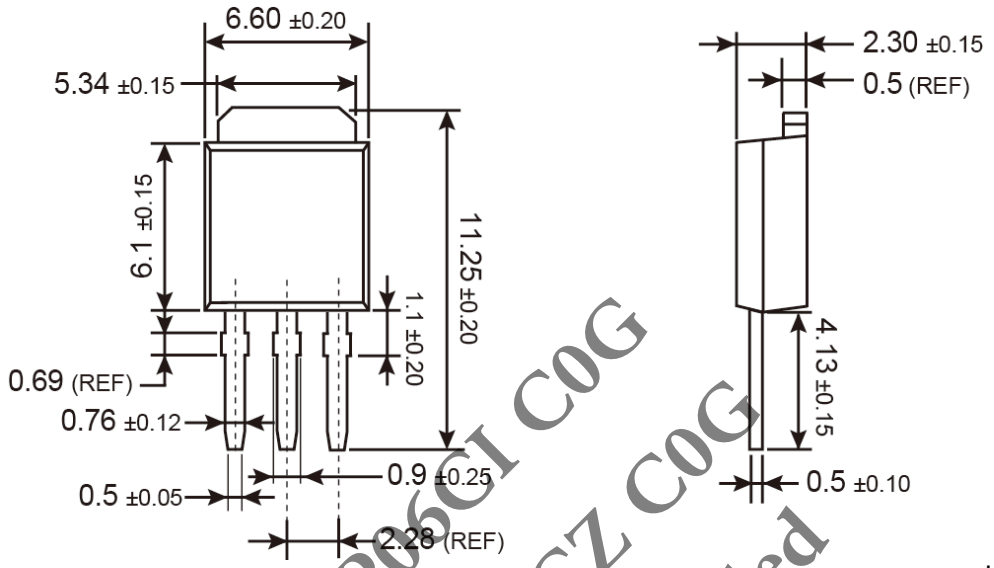
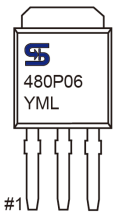
TO-251S Mechanical Drawing



Unit: Millimeters

Marking Diagram

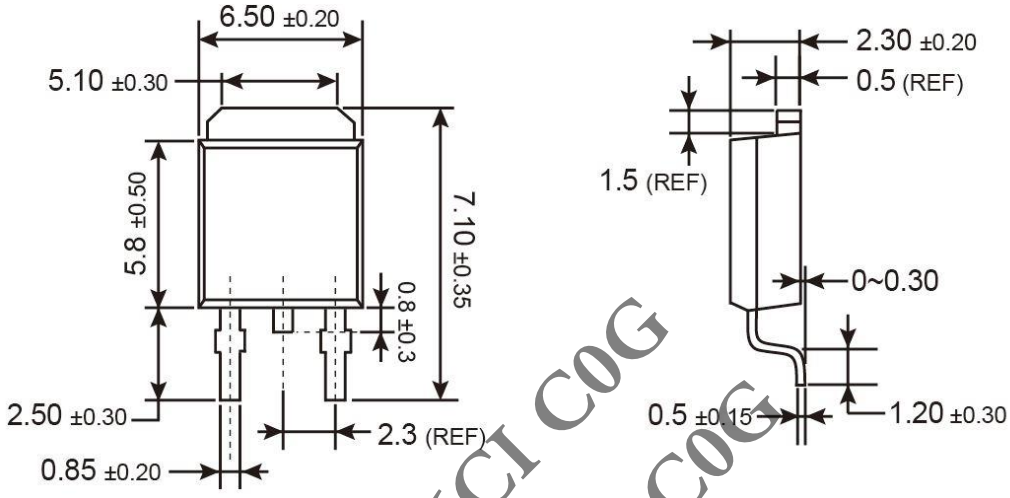


Y = Year Code

M = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apl, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)

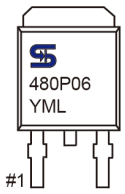
L = Lot Code

TO-252 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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