



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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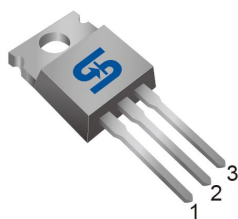
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

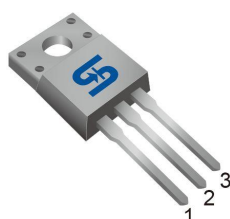




TO-220



ITO-220



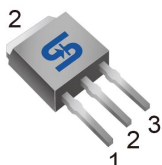
Pin Definition:

1. Gate
2. Drain
3. Source

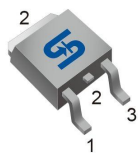
Key Parameter Performance

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

TO-251S (IPAK)



TO-252 (DPAK)

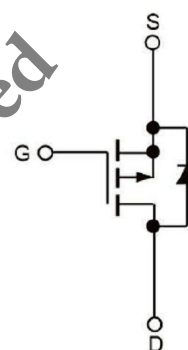


Ordering Information

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 / 13 Reel

Note: 'G' denotes 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 MOSFET

Absolute Maximum Ratings ($T_c = 25^\circ C$ 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)	I_D	$T_c = 25^\circ C$			A
		$T_c = 100^\circ C$			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 @ $T_c = 25^\circ C$	P_D	40	27	66	W
Operating Junction Temperature	T_J	-50 to +150			$^\circ C$
Storage Temperature Range	T_{STG}	-50 to +150			$^\circ C$



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 ($T_C = 25^\circ\text{C}$ unless otherwise noted)

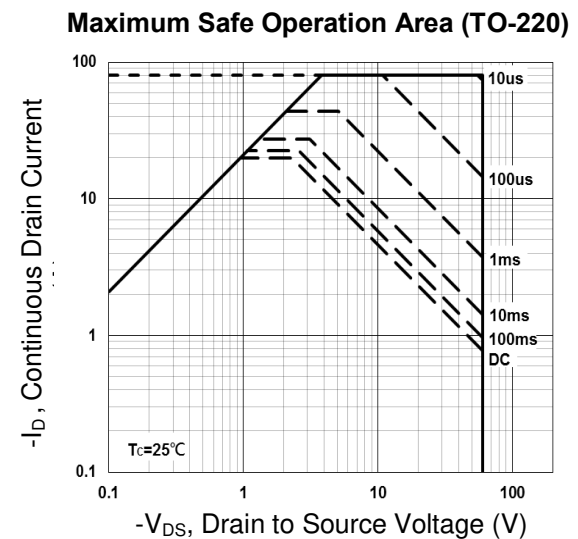
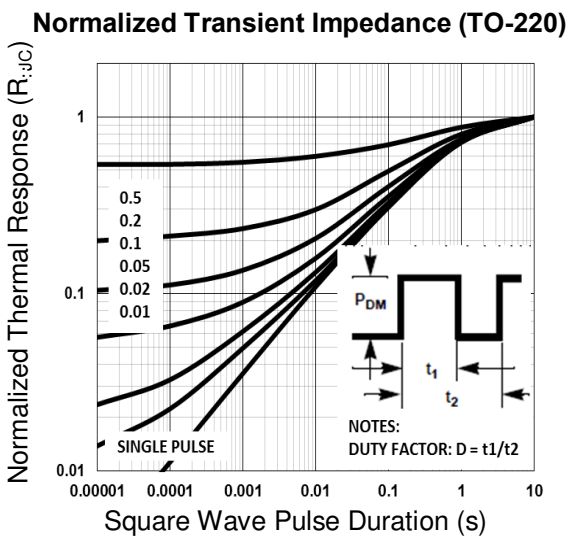
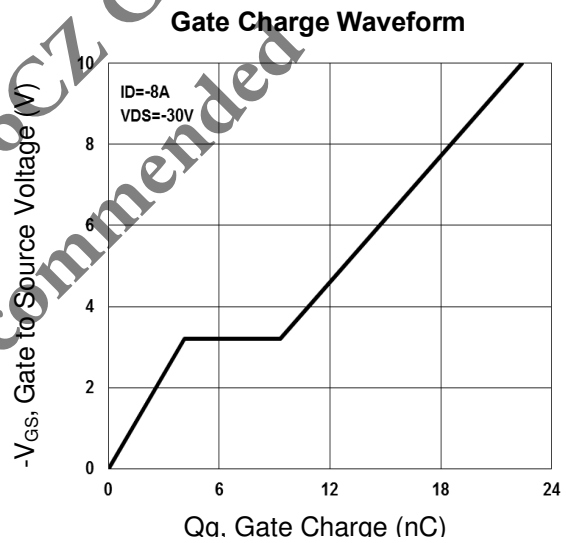
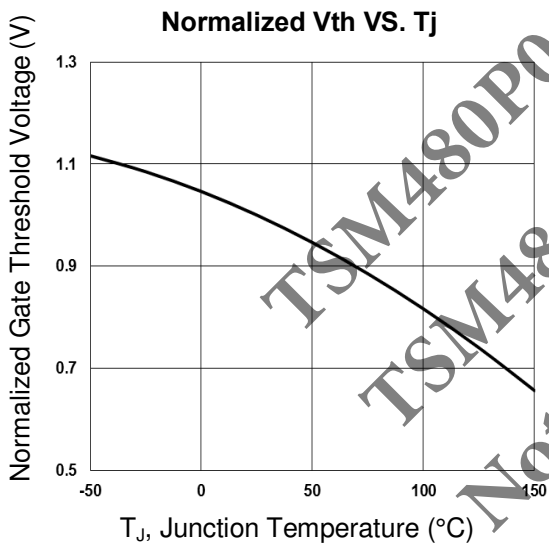
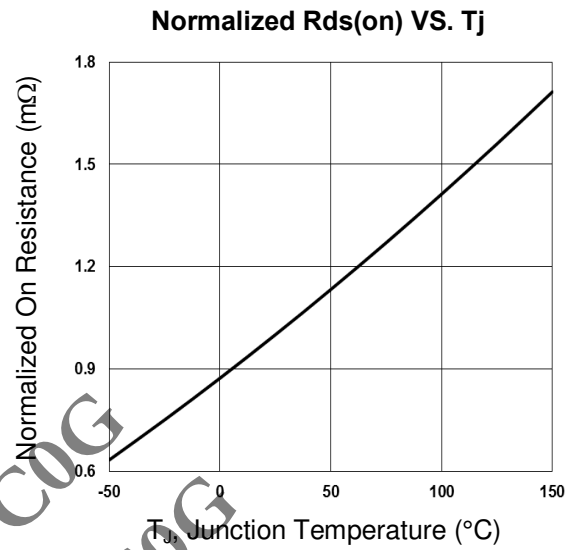
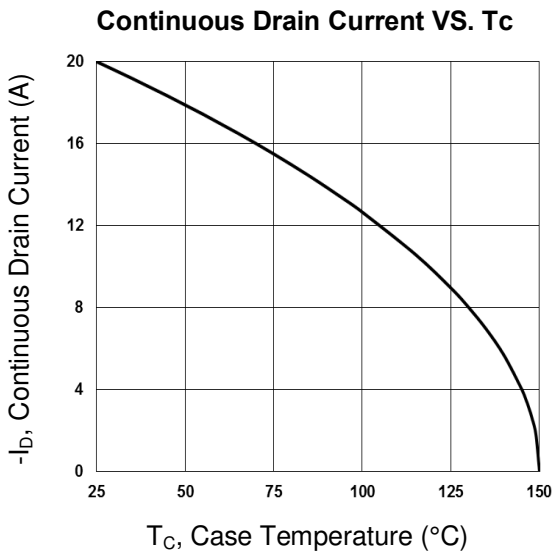
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	-60	--	--	V
Drain-Source On-State Resistance	$V_{GS} = -10V, I_D = -8A$	$R_{DS(ON)}$	--	39	48	m Ω
	$V_{GS} = -4.5V, I_D = -4A$		--	53	65	
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	$V_{GS(TH)}$	-1.2	-1.6	-2.2	V
Zero Gate Voltage Drain Current	$V_{DS} = -60V, V_{GS} = 0V$	I_{DSS}	--	--	-1	μA
	$V_{DS} = -48V, T_C = 125^\circ\text{C}$		--	--	-10	
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	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	$V_{DS} = -30V, V_{GS} = 0V,$ $f = 1.0\text{MHz}$	C_{iss}	--	1250	--	pF
Output Capacitance		C_{oss}	--	85	--	
Reverse Transfer Capacitance		C_{rss}	--	65	--	
Switching						
Turn-On Delay Time (Note 4,5)	$V_{DD} = -30V, I_D = -1A,$ $R_{GEN} = 6\Omega$	$t_{d(on)}$	--	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:

- Limited by maximum junction temperature
- Pulse width limited by safe operating area
- $L = 3.68\text{mH}, I_{AS} = 8A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
- Pulse test: pulse width $\neq 300\mu\text{s}$, duty cycle $\neq 2\%$
- Switching time is essentially independent of operating temperature



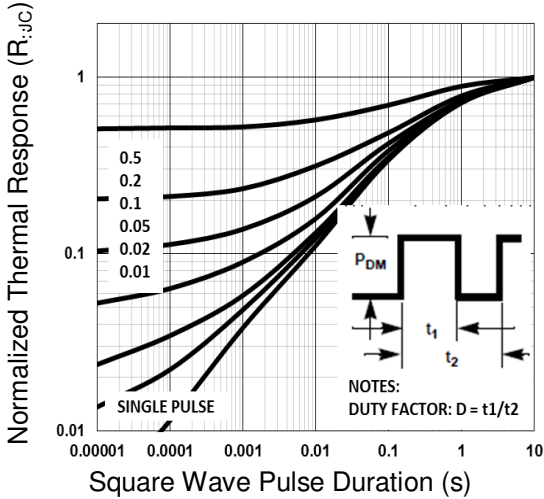
Electrical Characteristics Curve



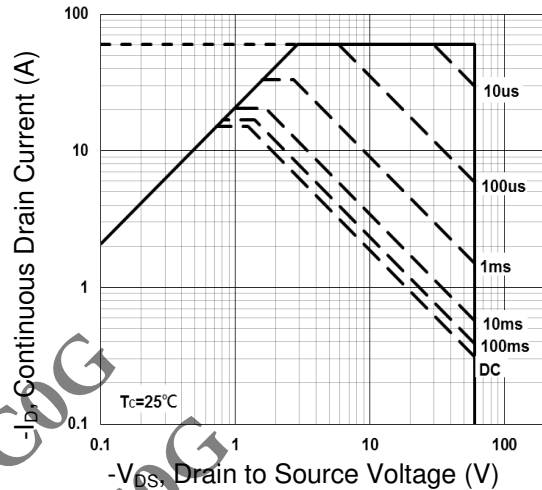


Electrical Characteristics Curve

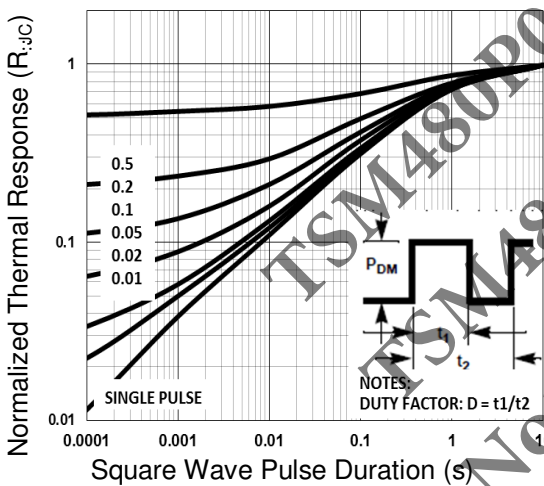
Normalized Transient Impedance (ITO-220)



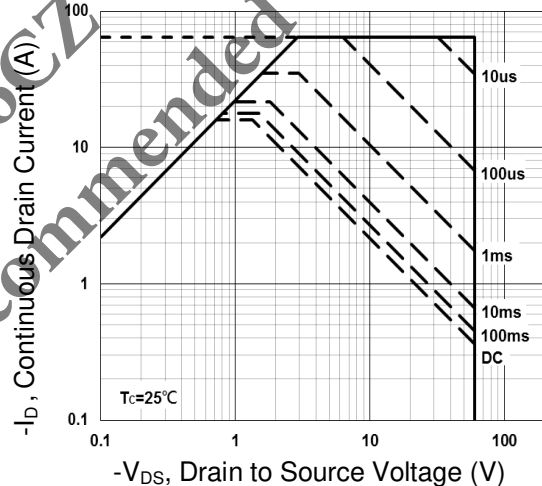
Maximum Safe Operation Area (ITO-220)



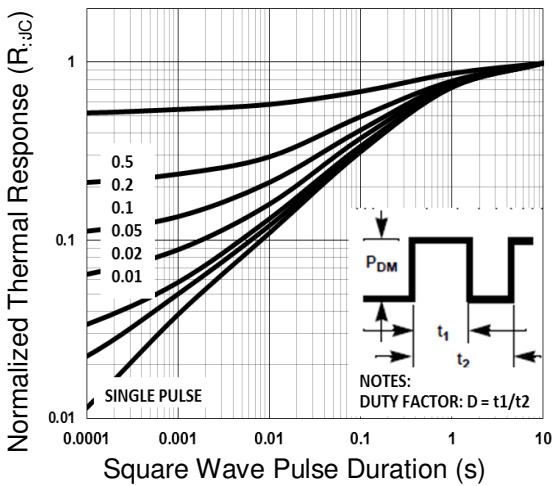
Normalized Transient Impedance (TO-251S)



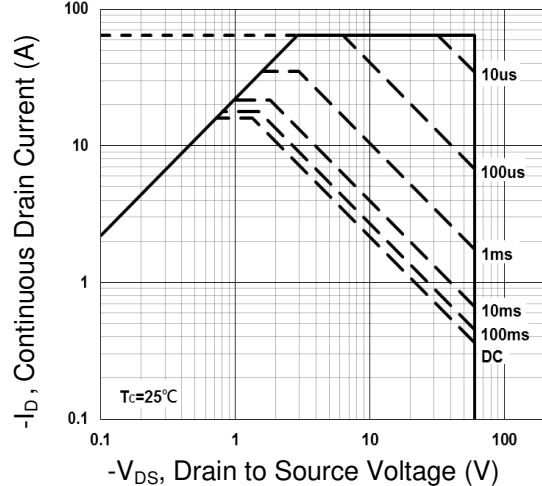
Maximum Safe Operation Area (TO-251S)



Normalized Transient Impedance (TO-252)

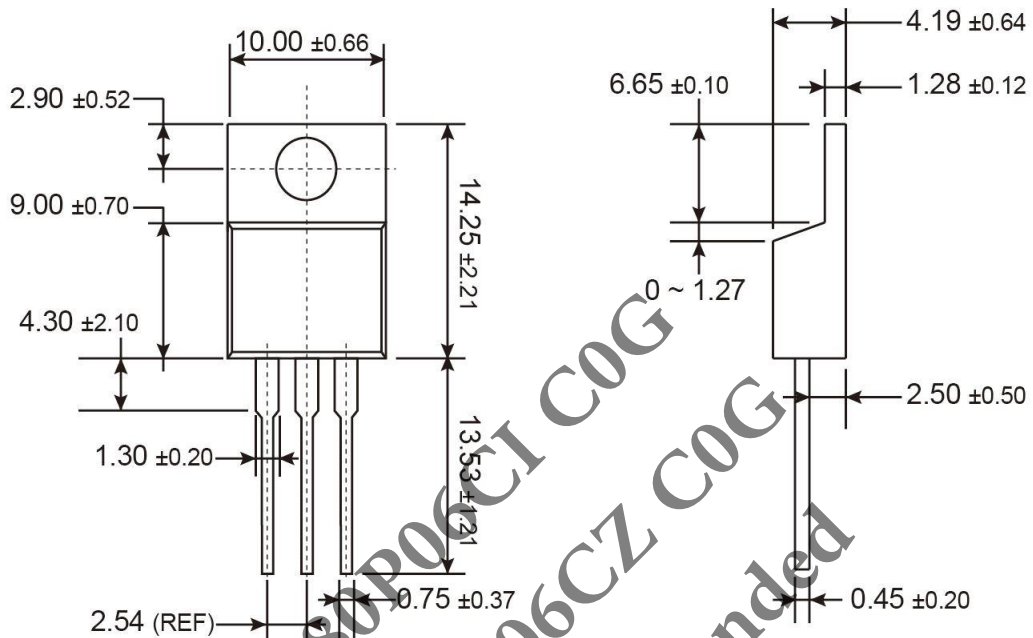


Maximum Safe Operation Area (TO-252)



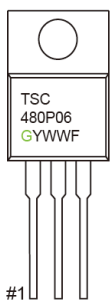


TO-220 Mechanical Drawing



Unit: Millimeters

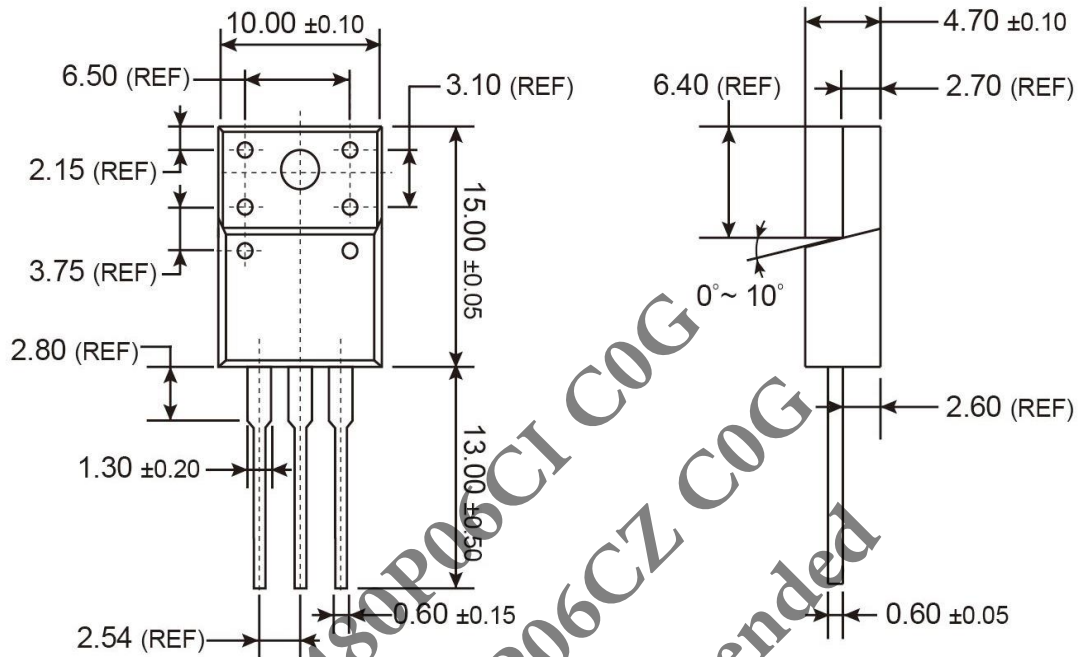
Marking Diagram



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



ITO-220 Mechanical Drawing



Unit: Millimeters

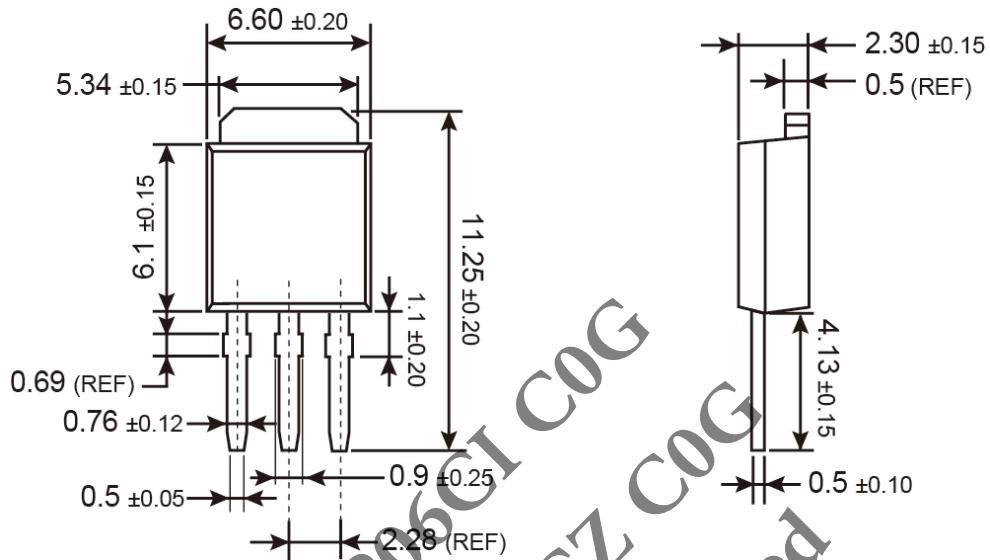
Marking Diagram



- G** = Halogen Free
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- WW** = Week Code (01~52)
- F** = Factory Code

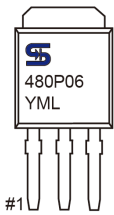


TO-251S Mechanical Drawing



Unit: Millimeters

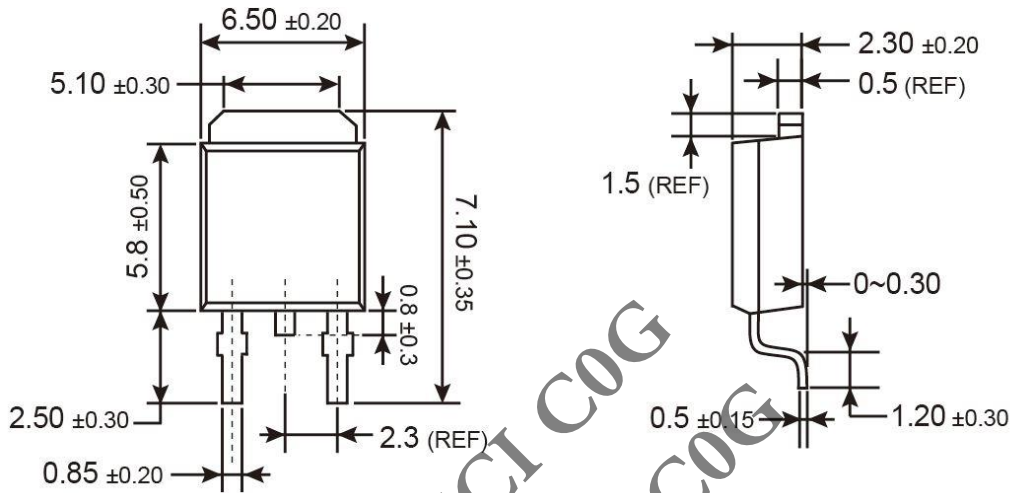
Marking Diagram



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

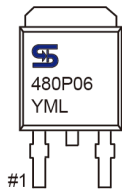


TO-252 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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

TSM480P06CI COG
TSM480P06CZ COG
Not Recommended

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