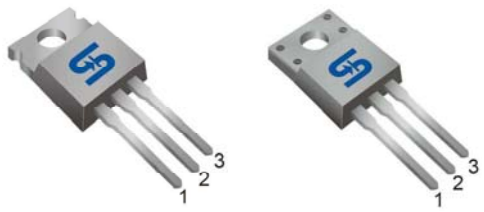
TAIWAN SEMICONDUCTOR

TSM22P10

-100V P-Channel Power MOSFET

Pb-Free RoHS COMPLIANT

TO-220 ITO-220



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

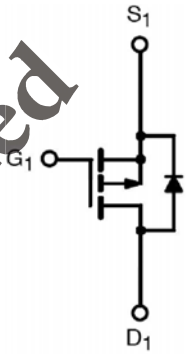
Key Parameter Performance

Parameter		Value	Unit
V_{DS}		-100	V
$R_{DS(on)}$ (max)	V_{GS} = -10V	140	mΩ
	V_{GS} = -4.5V	170	
Q_g		42	nC

Application

- Networking
- Load Switch
- LED applications

Block Diagram



P-Channel MOSFET

Ordering Information

Part No.	Package	Packing
TSM22P10CZ C0G	TO-220	50pcs / Tube
TSM22P10CI C0G	ITO-220	50pcs / Tube

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

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

Parameter		Symbol	Limit		Unit
			TO-220	ITO-220	
Drain-Source Voltage		V_{DS}	-100		V
Gate-Source Voltage		V_{GS}	±25		V
Continuous Drain Current (Note 1)	Tc = 25°C	I_D	-22		A
	Tc = 100°C		-14		A
Pulsed Drain Current (Note 2)		I_{DM}	-88		A
Power Dissipation @ T_C = 25°C		P_D	125	48	W
Operating Junction Temperature		T_J	150		°C
Storage Temperature Range		T_{STG}	-55 to +150		°C

Thermal Performance

Parameter	Symbol	Limit		Unit
		TO-220	ITO-220	
Thermal Resistance - Junction to Case	$R_{\Theta JC}$	1.0	2.6	°C/W
Thermal Resistance - Junction to Ambient	$R_{\Theta JA}$	62		

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

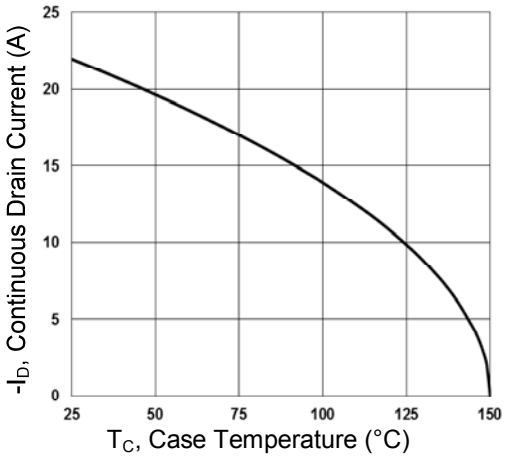
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = -250μA	BV_{DSS}	-100	--	--	V
Drain-Source On-State Resistance	V_{GS} = -10V, I_D = -20A	$R_{DS(ON)}$	--	115	140	mΩ
	V_{GS} = -4.5V, I_D = -10A		--	130	170	
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	$V_{GS(TH)}$	-1	--	-3	V
Zero Gate Voltage Drain Current	V_{DS} = -100V, V_{GS} = 0V	I_{DSS}	--	--	-1	μA
	V_{DS} = -80V, T_J = 125°C		--	--	-10	
Gate Body Leakage	V_{GS} = ±25V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Dynamic						
Total Gate Charge (Note 3,4)	V_{DS} = -50V, I_D = -20A, V_{GS} = -10V	Q_g	--	42	--	nC
Gate-Source Charge (Note 3,4)		Q_{gs}	--	8	--	
Gate-Drain Charge (Note 3,4)		Q_{gd}	--	5.6	--	
Input Capacitance	V_{DS} = -30V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	2250	--	pF
Output Capacitance		C_{oss}	--	130	--	
Reverse Transfer Capacitance		C_{rss}	--	90	--	
Switching						
Turn-On Delay Time (Note 3,4)	V_{DD} = -30V, I_D = -1A, V_{GS} = -10V, R_G =6Ω	$t_{d(on)}$	--	--	--	ns
Turn-On Rise Time (Note 3,4)		t_r	--	--	--	
Turn-Off Delay Time (Note 3,4)		$t_{d(off)}$	--	--	--	
Turn-Off Fall Time (Note 3,4)		t_f	--	--	--	
Source-Drain Diode Ratings and Characteristic						
Maximum Continuous Drain-Source Diode Forward Current	Integral reverse diode in the MOSFET	I_S	--	--	-22	A
Maximum Pulse Drain-Source Diode Forward Current		I_{SM}	--	--	-88	A
Diode-Source Forward Voltage	V_{GS} = 0V, I_S = -1A	V_{SD}	--	--	-1.1	V

Note:

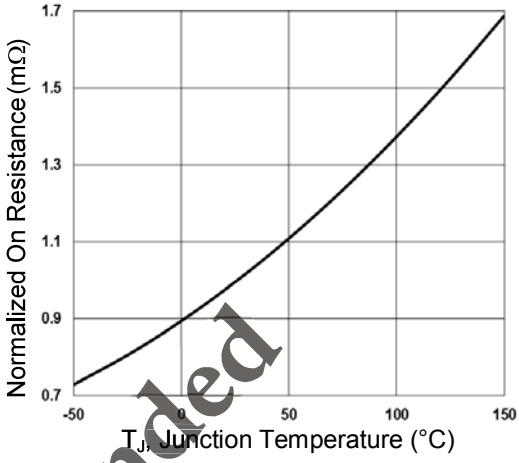
1. Limited by maximum junction temperature
2. Pulse width limited by safe operating area
3. Pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%
4. Switching time is essentially independent of operating temperature.

Electrical Characteristics Curve

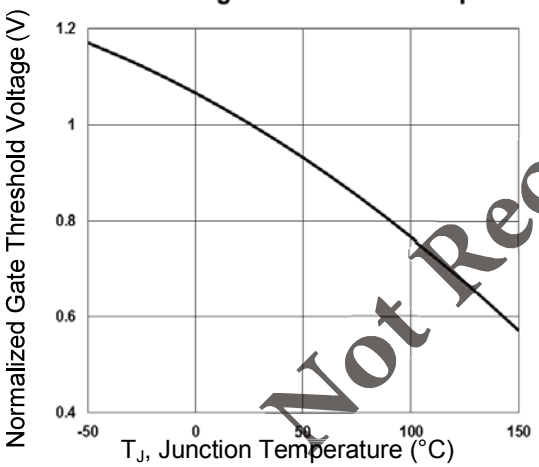
Continuous Drain Current vs. T_C



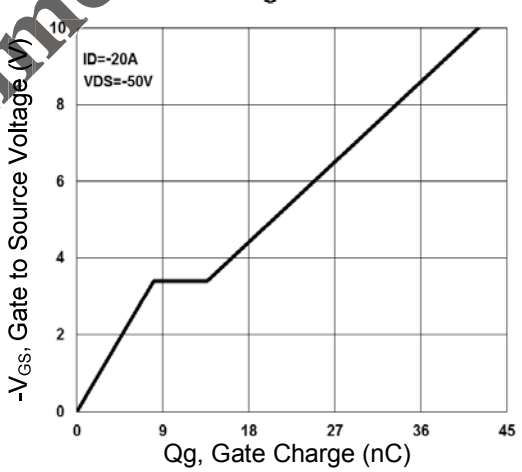
Normalized $R_{DS}(on)$ vs. T_J



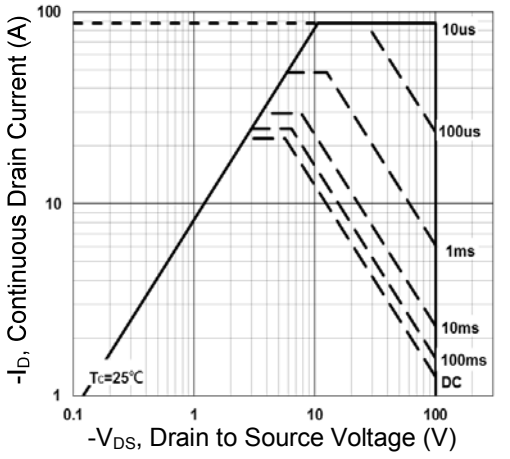
Threshold Voltage vs. Junction Temperature



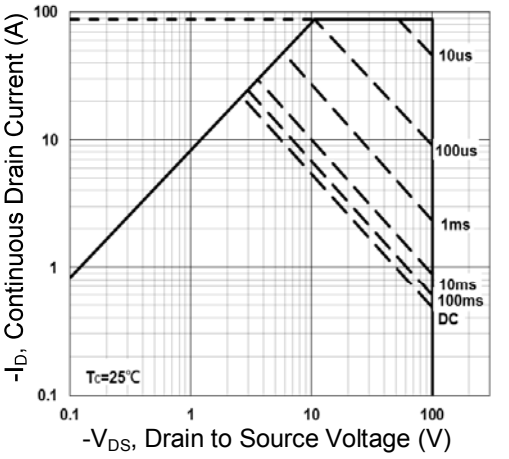
Gate Charge Waveform



Maximum Safe Operating Area (TO-220)

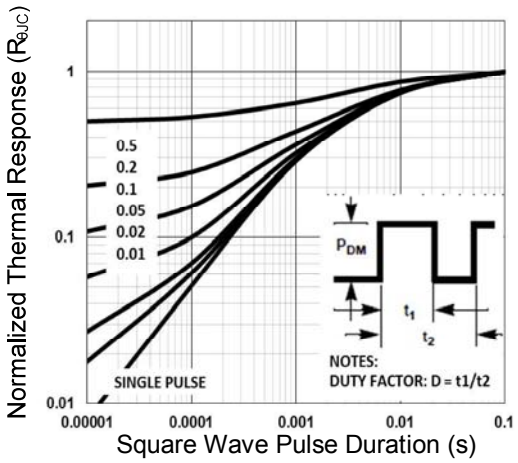


Maximum Safe Operating Area (ITO-220)

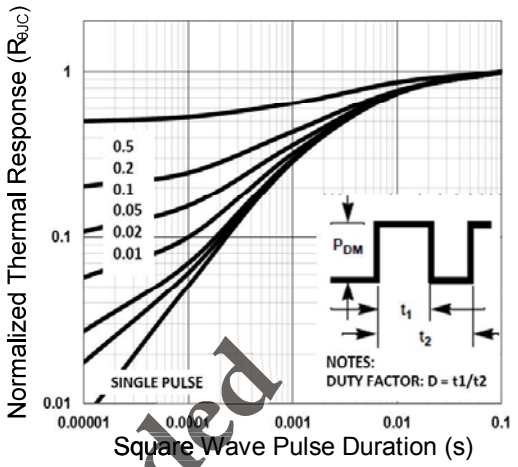


Electrical Characteristics Curve

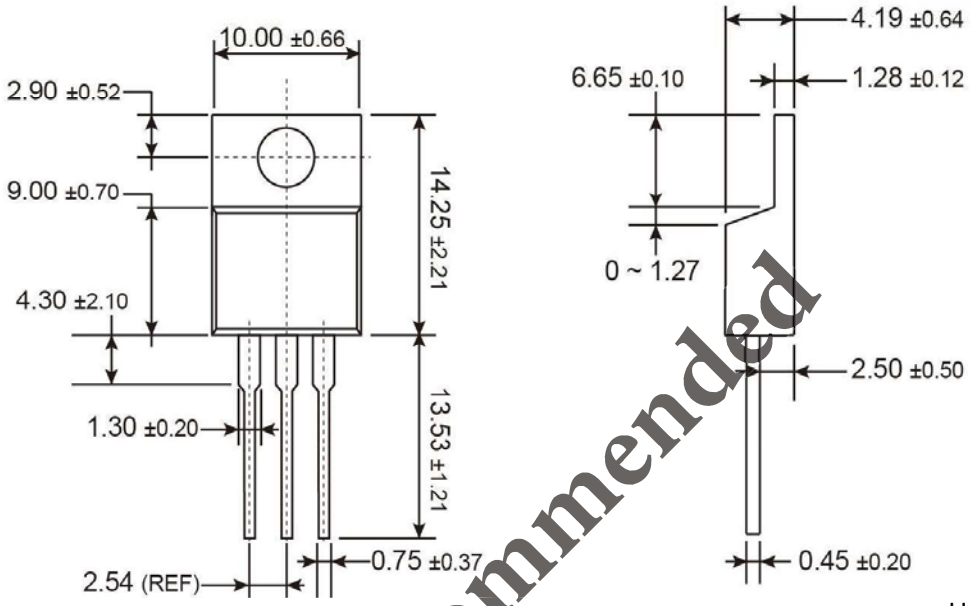
Normalized Thermal Transient Impedance (TO-220)



Normalized Thermal Transient Impedance (ITO-220)



TO-220 Mechanical Drawing

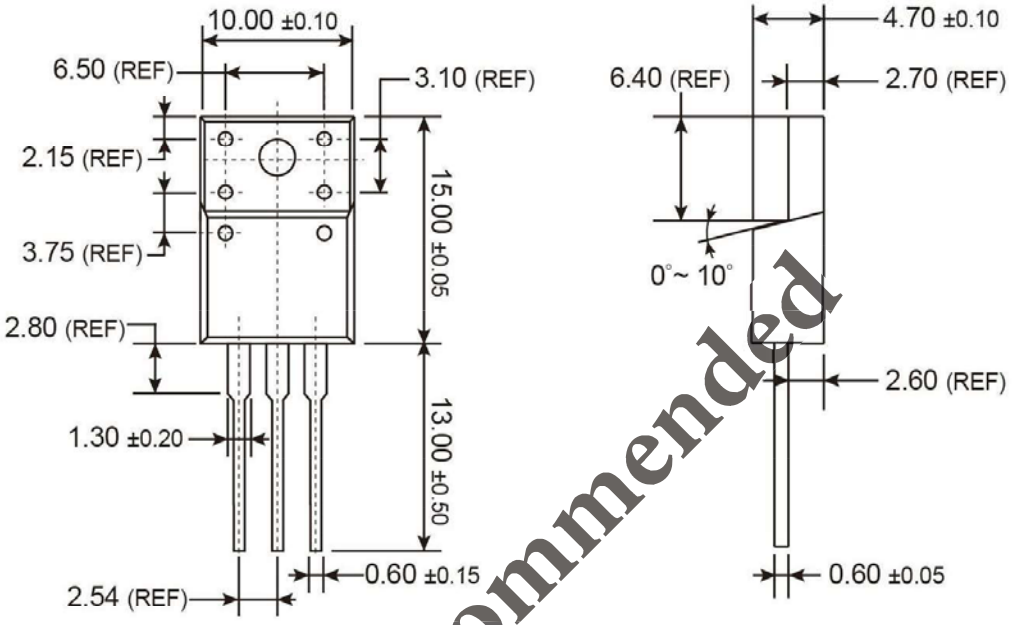


Unit: Millimeters

Marking Diagram

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

ITO-220 Mechanical Drawing



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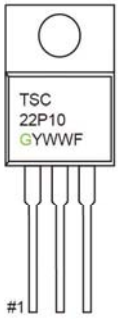
Marking Diagram



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