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

N-Channel Power MOSFET

900V, 7A, 1.9Ω

FEATURES

- Low RDS(on) 1.9Ω (Max.)
- Low gate charge typical @49nC (Typ.)
- Improve dV/dt capability
- Pb-free plating
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition

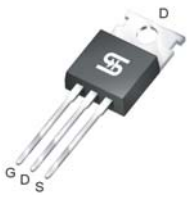
APPLICATION

- Power Supply
- Lighting

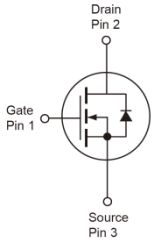
KEY PERFORMANCE PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
V_{DS}	900	V
$R_{DS(on)}$ (max)	1.9	Ω
Q_g	49	nC

Pb-Free RoHS COMPLIANT HALOGEN FREE

TO-220



ITO-220



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)					
PARAMETER		**SYMBOL**	**TO-220**	**ITO-220**	**UNIT**
Drain-Source Voltage		V_{DS}	900		V
Gate-Source Voltage		V_{GS}	±30		V
Continuous Drain Current (Note 1)	T_C = 25°C	I_D	7		A
	T_C = 100°C		4.31		A
Pulsed Drain Current (Note 2)		I_{DM}	28		A
Total Power Dissipation @ T_C = 25°C		P_{DTOT}	250	40.3	W
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	106		mJ
Single Pulsed Avalanche Current (Note 3)		I_{AS}	7		A
Operating Junction and Storage Temperature Range		T_J, T_{STG}	- 55 to +150		°C

THERMAL PERFORMANCE				
PARAMETER	**SYMBOL**	**TO-220**	**ITO-220**	**UNIT**
Junction to Case Thermal Resistance	$R_{\Theta JC}$	0.5	3.1	°C/W
Junction to Ambient Thermal Resistance	$R_{\Theta JA}$	62.5		°C/W

Notes: $R_{\Theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistances. The case thermal reference is defined at the solder mounting surface of the drain pins. $R_{\Theta JA}$ is guaranteed by design while $R_{\Theta CA}$ is determined by the user's board design. $R_{\Theta JA}$ shown below for single device operation on FR-4 PCB with minimum recommended footprint in still air.

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)						
PARAMETER	**CONDITIONS**	**SYMBOL**	**MIN**	**TYP**	**MAX**	**UNIT**
Static (Note 4)						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	BV_{DSS}	900	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	2	--	4	V
Gate Body Leakage	V_{GS} = ±30V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS} = 900V, V_{GS} = 0V	I_{DSS}	--	--	10	μA
Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 3.5A	$R_{DS(on)}$	--	1.52	1.9	Ω
Dynamic (Note 5)						
Total Gate Charge	V_{DS} = 720V, I_D = 7A, V_{GS} = 10V	Q_g	--	49	--	nC
Gate-Source Charge		Q_{gs}	--	7	--	
Gate-Drain Charge		Q_{gd}	--	20	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	1969	--	pF
Output Capacitance		C_{oss}	--	133	--	
Reverse Transfer Capacitance		C_{rss}		11		
Switching (Note 6)						
Turn-On Delay Time	V_{DD} = 380V, R_{GEN} = 25Ω, I_D = 10A, V_{GS} = 10V,	$t_{d(on)}$	--	39	--	ns
Turn-On Rise Time		t_r	--	38	--	
Turn-Off Delay Time		$t_{d(off)}$	--	155	--	
Turn-Off Fall Time		t_f	--	45	--	
Source-Drain Diode (Note 4)						
Forward On Voltage	I_S = 10A, V_{GS} = 0V	V_{SD}	--	--	1.4	V
Reverse Recovery Time	I_S = 7A, dI_F/dt = 100A/μs	t_{rr}	--	464	--	ns
Reverse Recovery Charge		Q_{rr}	--	4.7	--	μC

Notes:

1. Current limited by package.
2. Pulse width limited by the maximum junction temperature.
3. L = 4.1mH, I_{AS} = 7A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
   100% Eas Test Condition: L = 1mH, I_{AS} = 3.5A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
4. Pulse test: PW ≤ 300μs, duty cycle ≤ 2%.
5. For DESIGN AID ONLY, not subject to production testing.
6. Switching time is essentially independent of operating temperature.

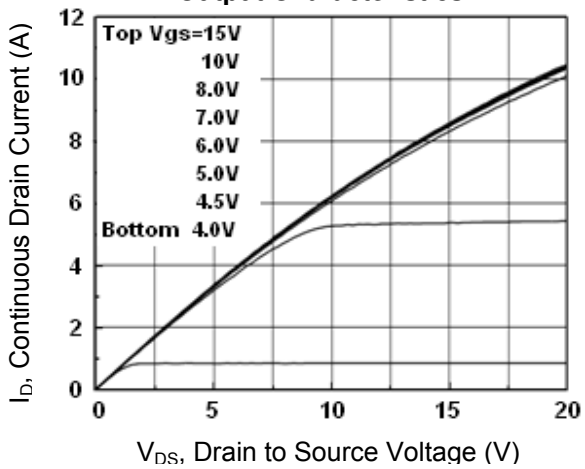
ORDERING INFORMATION

PART NO.	PACKAGE	PACKING
TSM7N90CZ C0G	TO-220	50pcs/Tube
TSM7N90CI C0G	ITO-220	50pcs/Tube

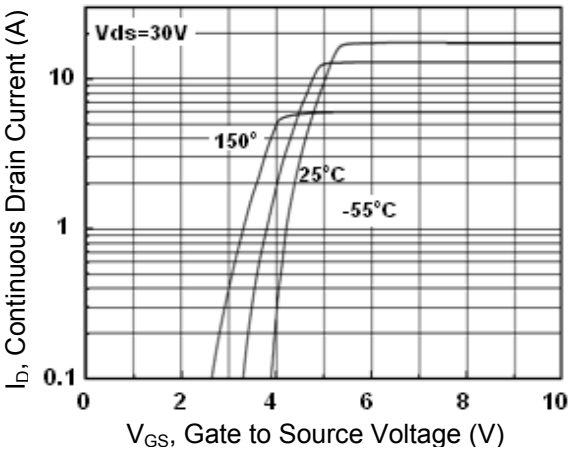
CHARACTERISTICS CURVES

(T_C = 25°C unless otherwise noted)

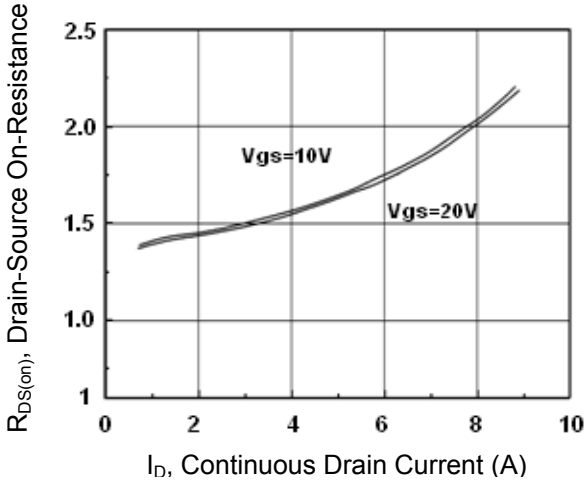
Output Characteristics



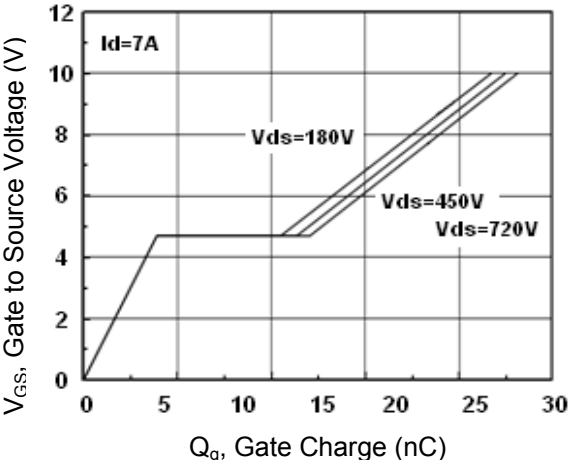
Transfer Characteristics



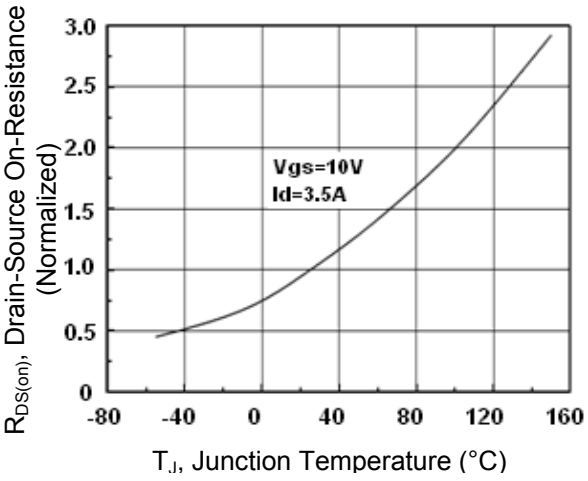
On-Resistance vs. Drain Current



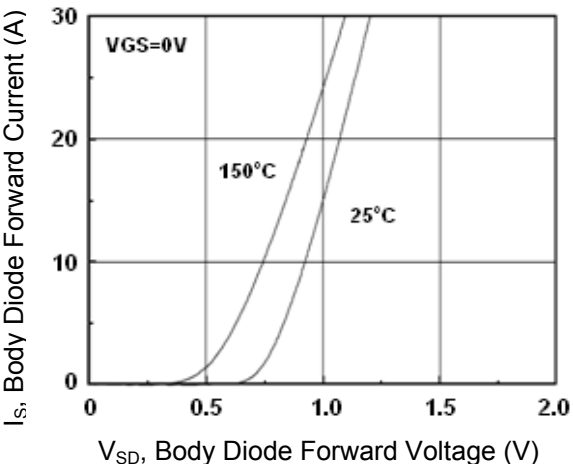
Gate Charge



On-Resistance vs. Junction Temperature



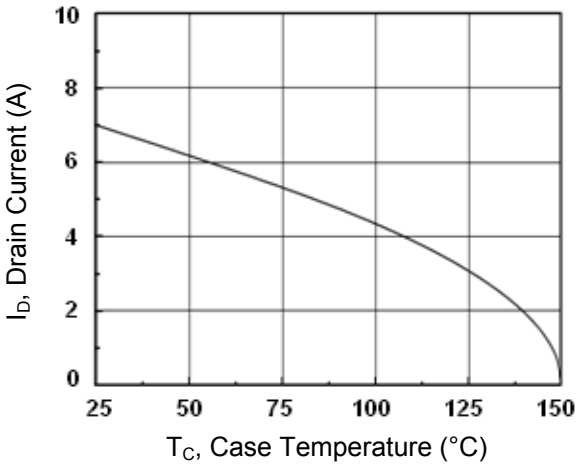
Source-Drain Diode Forward Current vs. Voltage



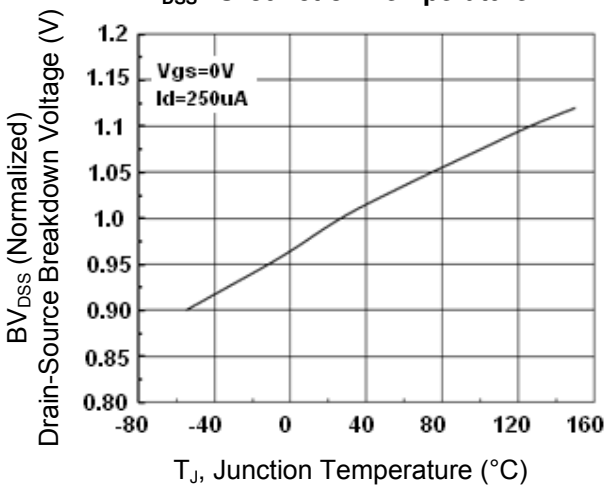
CHARACTERISTICS CURVES

(T_C = 25°C unless otherwise noted)

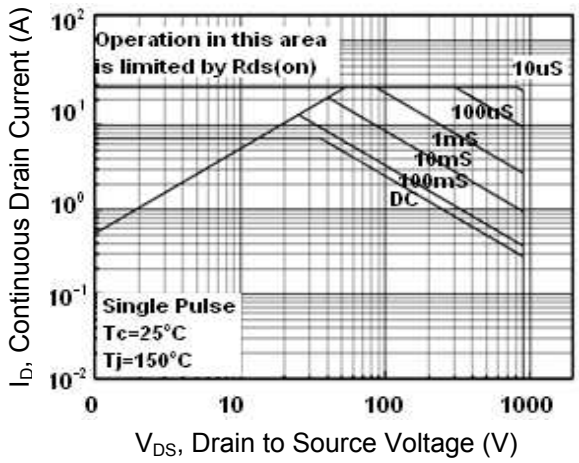
Drain Current vs. Case Temperature



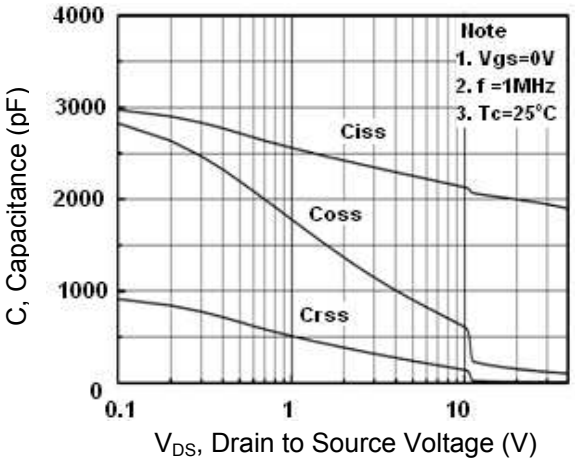
BV_{DSS} vs. Junction Temperature



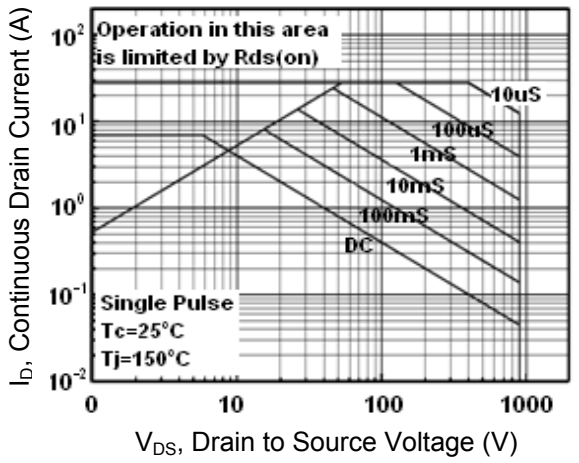
Maximum Safe Operating Area (TO-220)



Capacitance vs. Drain-Source Voltage



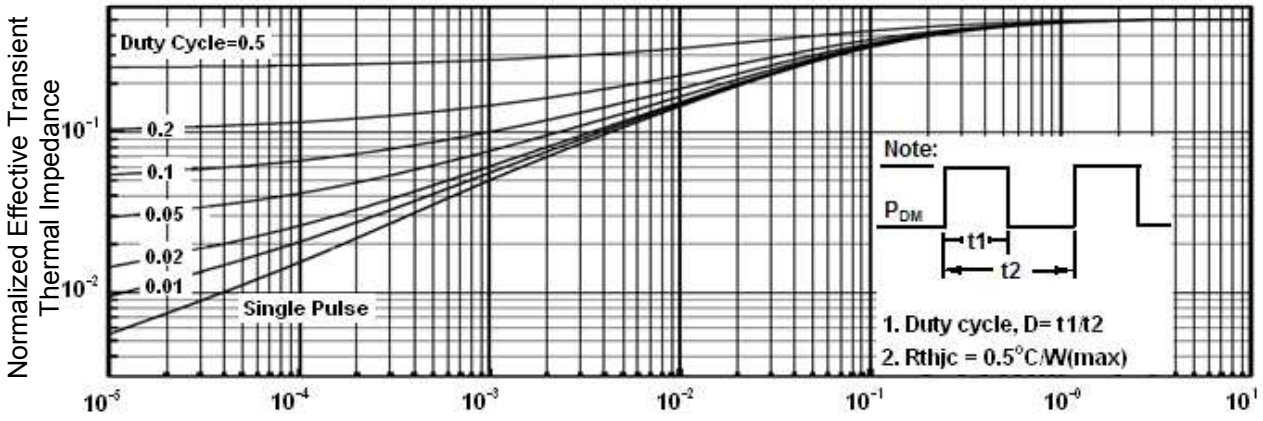
Maximum Safe Operating Area (ITO-220)



CHARACTERISTICS CURVES

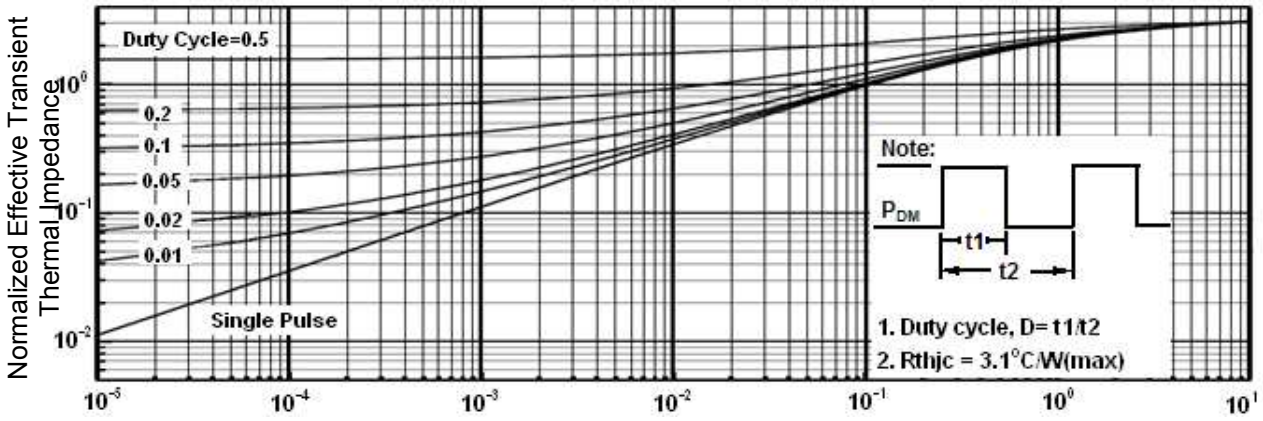
(T_C = 25°C unless otherwise noted)

Normalized Thermal Transient Impedance, Junction-to-Case (TO-220)



Square Wave Pulse Duration (s)

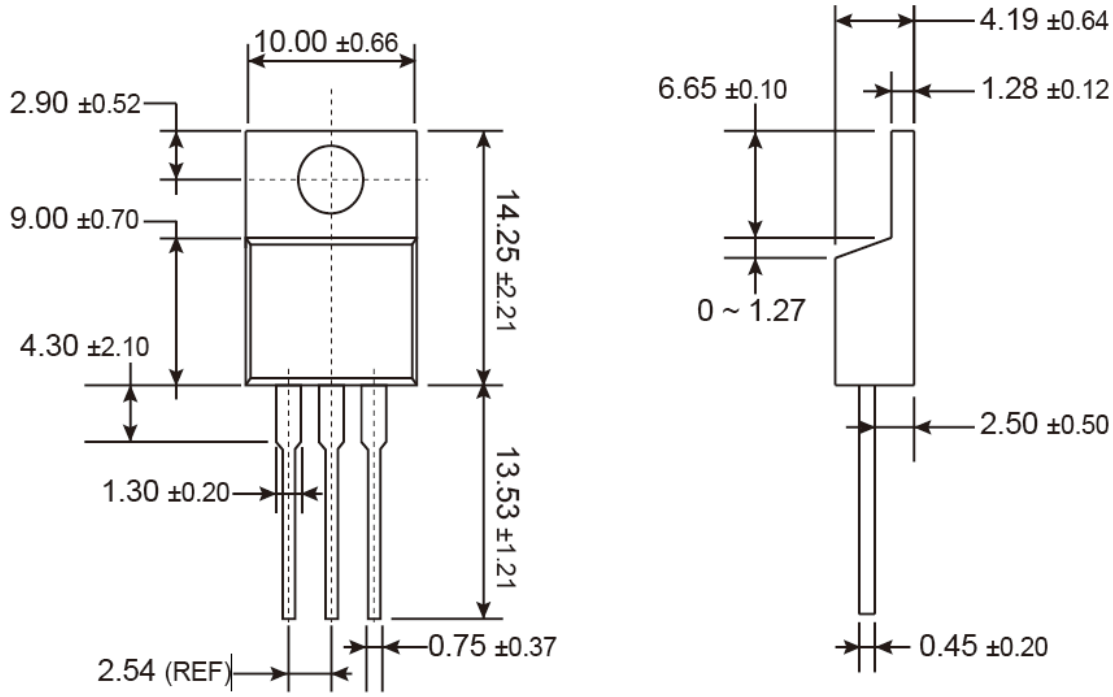
Normalized Thermal Transient Impedance, Junction-to-Case (ITO-220)



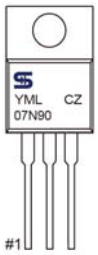
Square Wave Pulse Duration (s)

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

TO-220



MARKING DIAGRAM



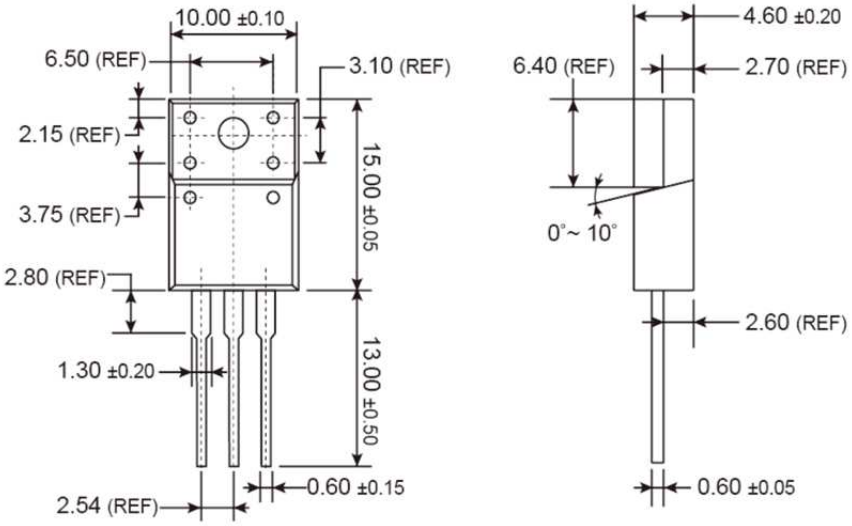
Y = Year Code
M = Month Code for Halogen Free Product

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 (1~9, A~Z)

PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

ITO-220



MARKING DIAGRAM

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

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