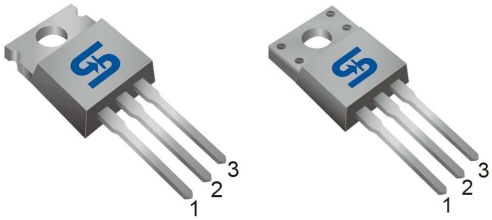
TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TSM10N60

600V N-Channel MOSFET

TO-220 **ITO-220**



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

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$(Ω)(max)	I_D (A)
600	0.75 @ V_{GS} =10V	10

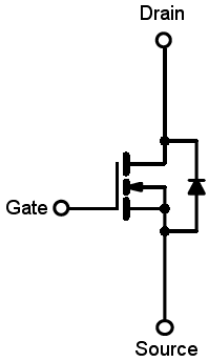
Features

- Advanced high dense cell design.
- High Power and Current handing capability.

Application

- Power Supply.
- Lighting.

Block Diagram



N-Channel MOSFET

Ordering Information

Part No.	Package	Packing
TSM10N60CZ C0	TO-220	50pcs / Tube
TSM10N60CI C0	ITO-220	50pcs / Tube

Absolute Maximum Rating (T_C = 25°C unless otherwise noted)

Parameter		Symbol	Limit		Unit
			TO-220	ITO-220	
Drain-Source Voltage		V_{DS}	600		V
Gate-Source Voltage		V_{GS}	±30		V
Continuous Drain Current	T_C = 25 °C	I_D [a]	10		A
	T_C = 100 °C		6		
Pulsed Drain Current [b]		I_{DM} [a]	40		A
Total Power Dissipation @ T_C=25C		P_{DTOT}	166	50	W
Single Pulsed Avalanche Energy [c]		E_{AS}	41		mJ
Operating Junction and Storage Temperature Range		T_J, T_{STG}	- 55 to +150		°C

Thermal Performance

Parameter	Symbol	Limit		Unit
Junction to Case Thermal Resistance	$R\Theta_{JC}$	0.75	2.5	°C/W
Junction to Ambient Thermal Resistance	$R\Theta_{JA}$	63		°C/W

Notes a: Current limited by package

Notes b: Pulse width limited by the Maximum junction temperature

Notes c: L=0.75mH, I_{AS}=10A, V_{DD}=50V, R_G=25Ω, Starting T_j=25℃

TSM10N60

600V N-Channel MOSFET

Specifications (Ta = 25°C unless otherwise noted)

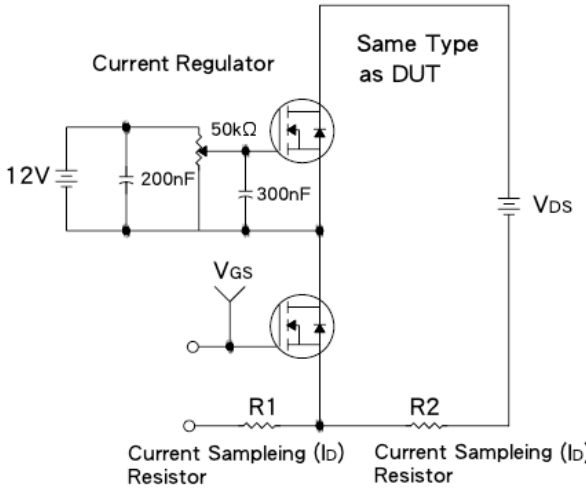
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static[a]						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	BV_{DSS}	600	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	2	3.1	4	V
Gate Body Leakage	V_{GS} = ±30V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS} = 600V, V_{GS} = 0V	I_{DSS}	--	--	20	μA
Drain-Source On-State Resistance	V_{GS} = 10V, I_D = 5A	$R_{DS(ON)}$	--	0.61	0.75	Ω
Dynamic[b]						
Total Gate Charge	V_{DS} = 300V, I_D = 10A, V_{GS} = 10V	Q_g	--	45.8	--	nC
Gate-Source Charge		Q_{gs}	--	11.5	--	
Gate-Drain Charge		Q_{gd}	--	16	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	1738	--	pF
Output Capacitance		C_{oss}	--	195	--	
Reverse Transfer Capacitance		C_{rss}	--	26.3	--	
Switching[b]						
Turn-On Delay Time	V_{DD} = 300V, R_G = 10Ω, I_D = 10A, V_{GS} = 10V,	$t_{d(on)}$	--	33.6	--	nS
Turn-On Rise Time		t_r	--	7.4	--	
Turn-Off Delay Time		$t_{d(off)}$	--	68	--	
Turn-Off Fall Time		t_f	--	15.2	--	
Source-Drain Diode[a]						
Forward On Voltage	I_S=10A, V_{GS}=0V	VSD	--	0.8	1.5	V

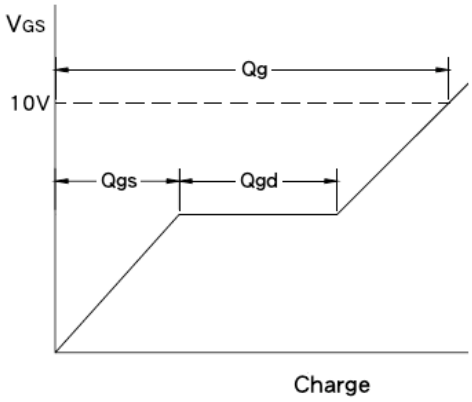
Notes a: Pulse test: PW ≤300μS, duty cycle ≤2%

Notes b: For DESIGN AID ONLY, not subject to production testing.

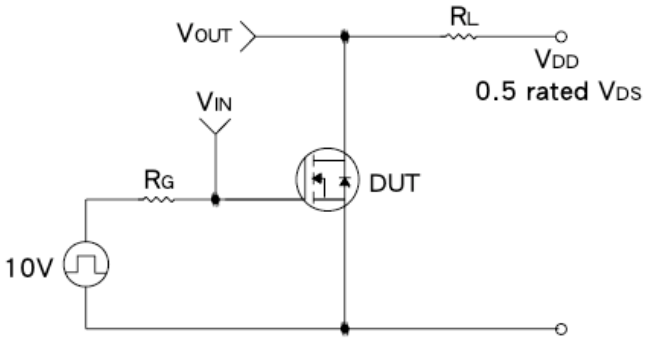
Notes c: Switching time is essentially independent of operating temperature.

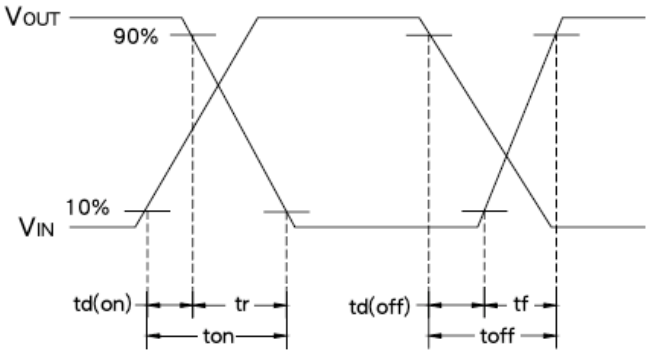
Gate Charge Test Circuit & Waveform



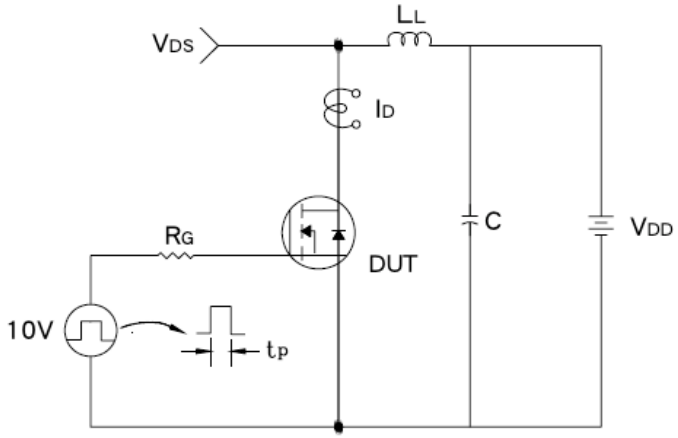


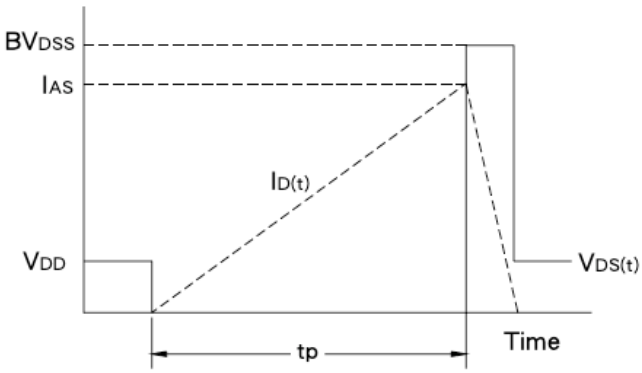
Resistive Switching Test Circuit & Waveform



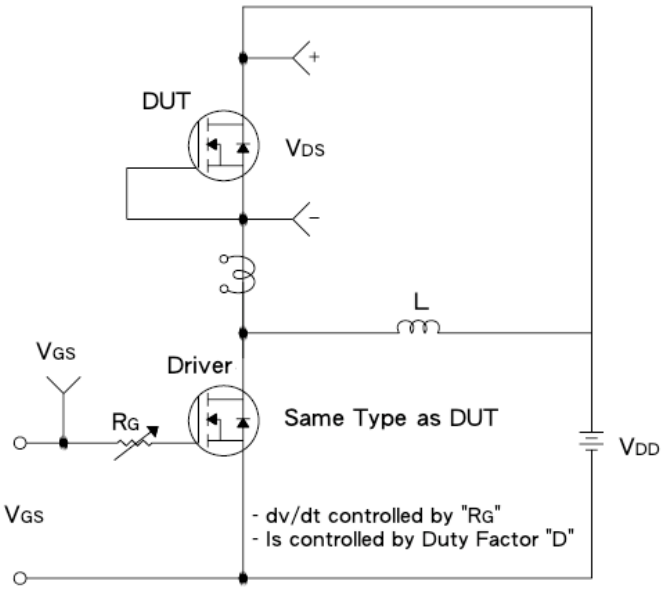


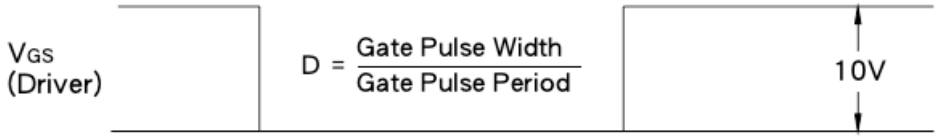
E_{AS} Test Circuit & Waveform

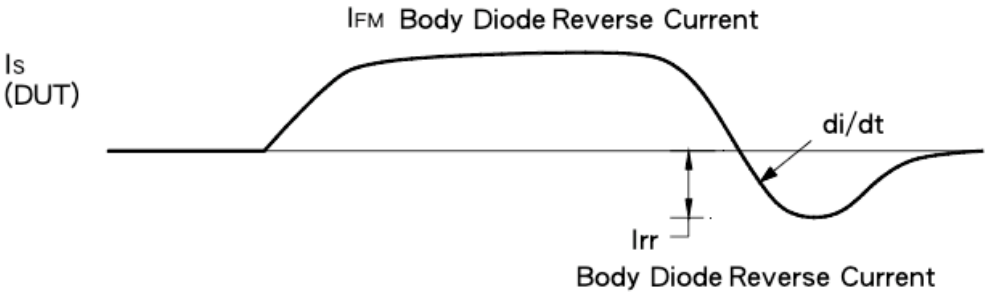


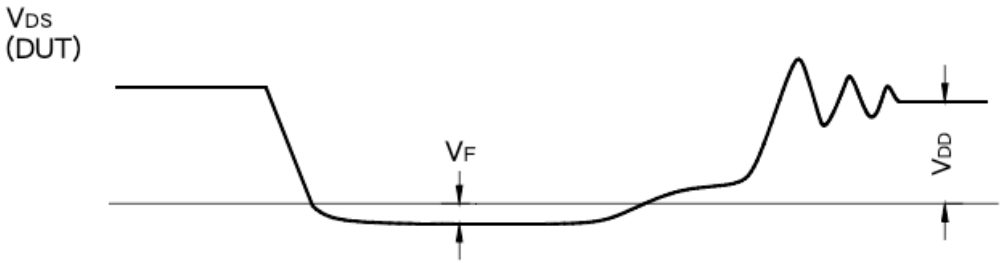


Diode Reverse Recovery Time Test Circuit & Waveform



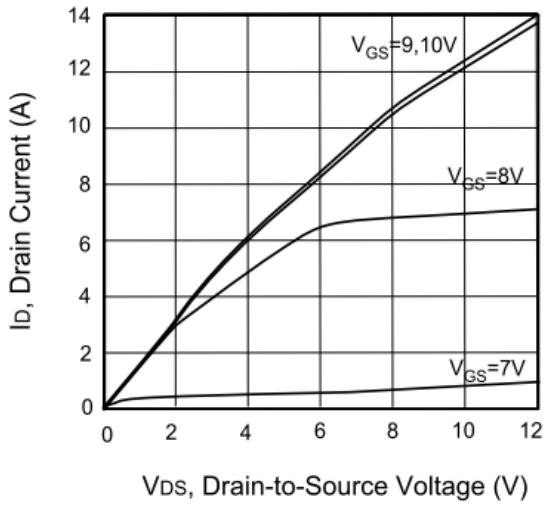




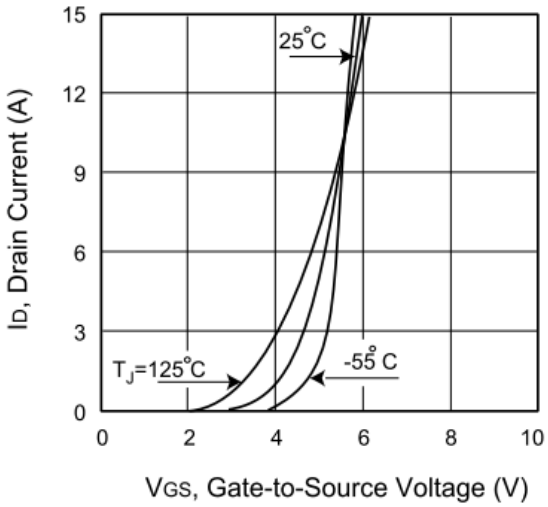


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

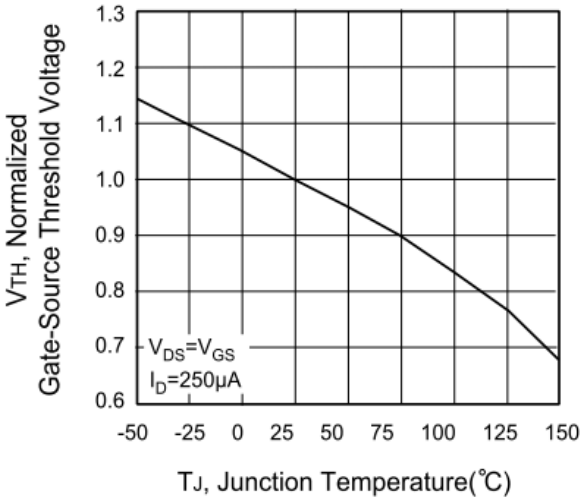
Output Characteristics



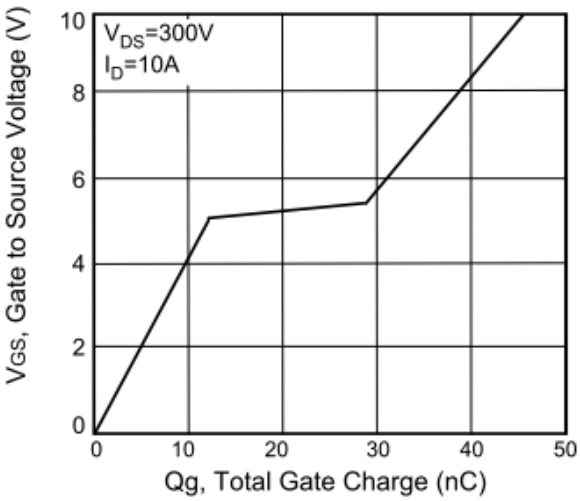
Transfer Characteristics



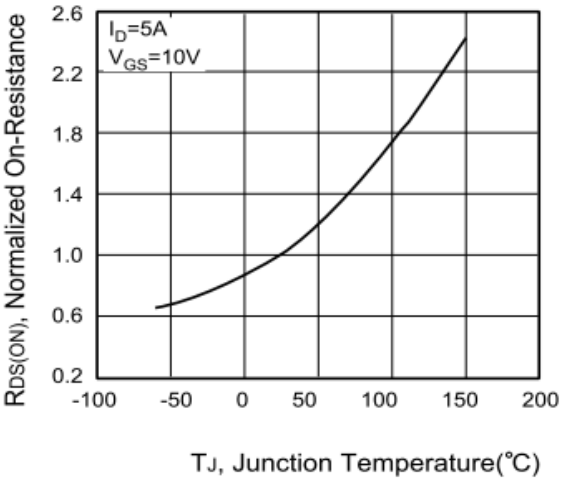
Threshold Voltage



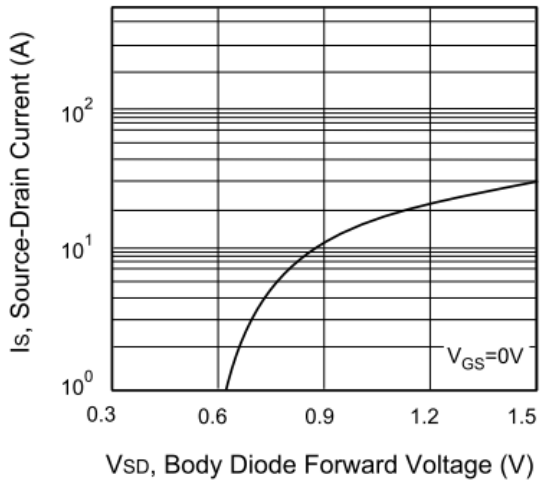
Gate Charge



On-Resistance vs. Junction Temperature



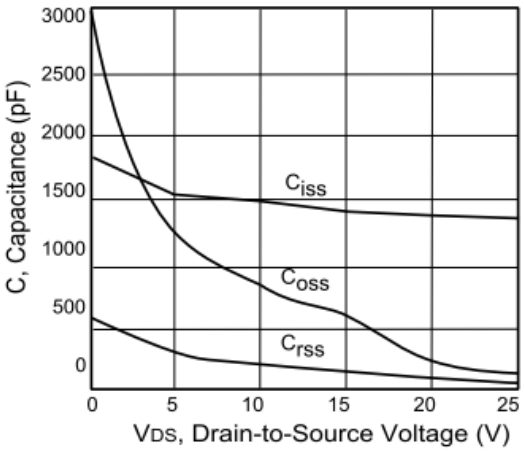
Source-Drain Diode Forward Voltage



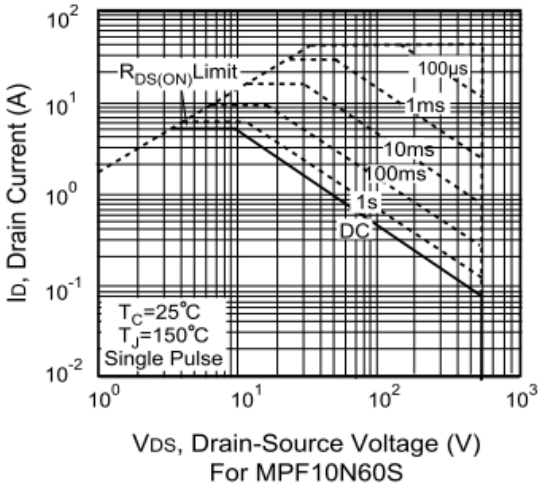
TSM10N60
600V N-Channel MOSFET

Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

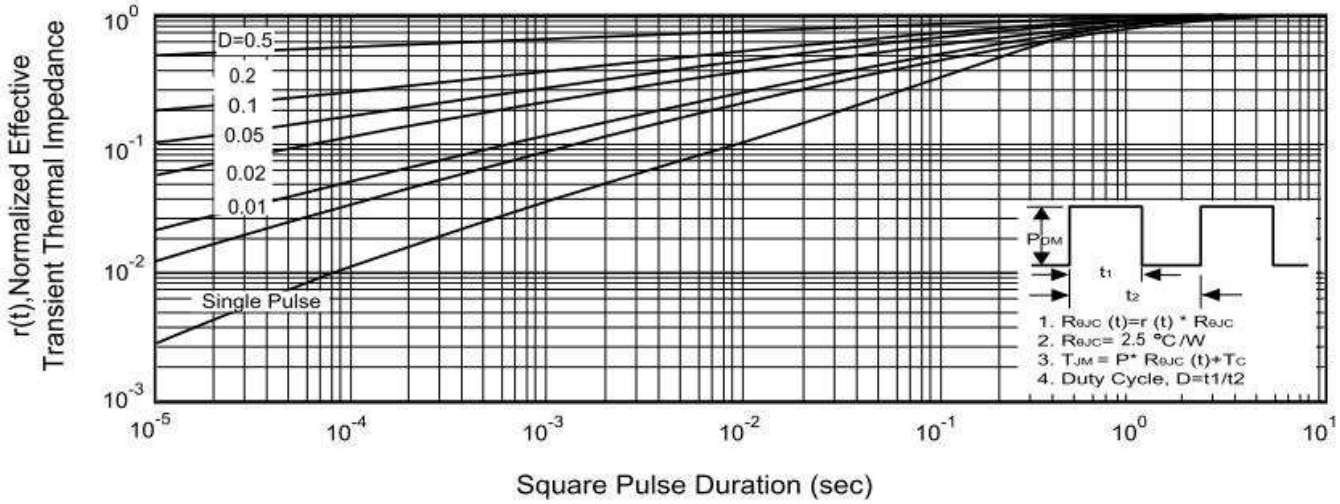
Capacitance Characteristics



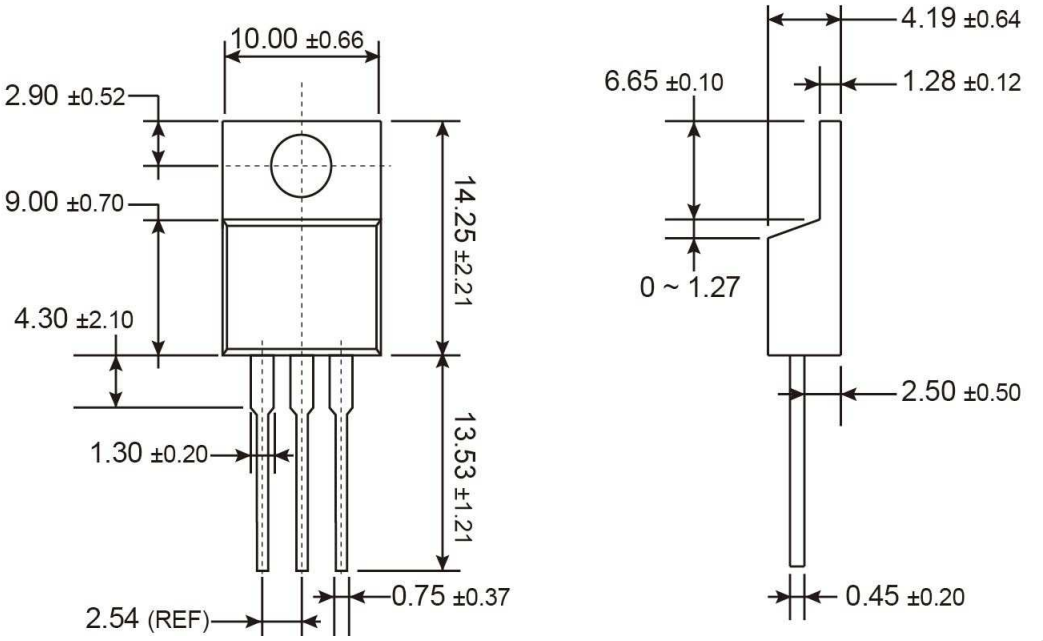
Maximum Safe Operating Area - ITO-220



Normalized Thermal Transient Impedance, Junction-to-Ambient

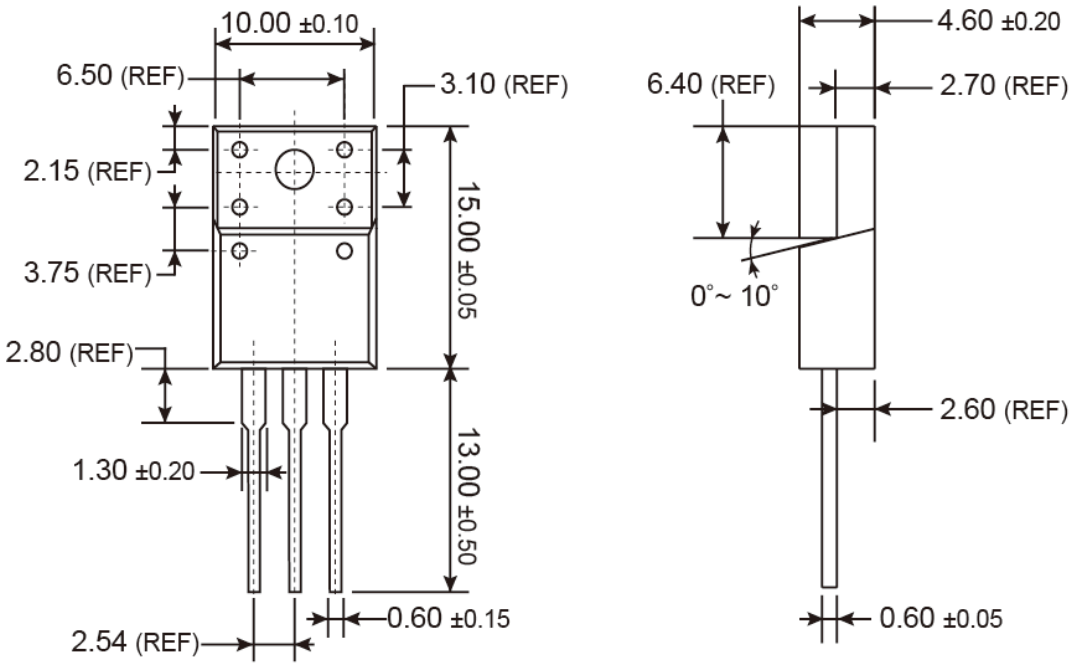


TO-220 Mechanical Drawing



Unit: Millimeters

ITO-220 Mechanical Drawing



Unit: Millimeters

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.