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!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

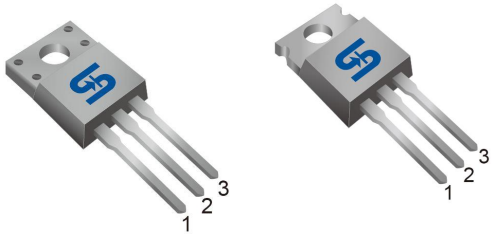
TAIWAN SEMICONDUCTOR

TSM13N50A

500V N-Channel MOSFET

Pb-Free RoHS COMPLIANT

ITO-220 **TO-220**



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

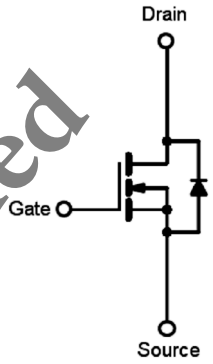
Key Parameter Performance

Parameter	Value	Unit
V_{DS}	500	V
$R_{DS(on)}$ (max)	0.48	Ω
Q_g	31	nC

Features

- Improved dv/dt capability
- 100% EAS Guaranteed

Block Diagram



N-Channel MOSFET

Ordering Information

Part No.	Package	Packing
TSM13N50ACI C0G	ITO-220	50pcs / Tube
TSM13N50ACZ C0G	TO-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 (T_C=25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	500	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current (Note 1)	T_C = 25°C	I_D	13	A
	T_C = 100°C		8	
Pulsed Drain Current (Note 1,2,3)		I_{DM}	52	A
Total Power Dissipation @ T_C=25°C		P_{DTOT}	52	W
Single Pulsed Avalanche Energy (Note 4)		E_{AS}	542	mJ
Operating Junction and Storage Temperature Range		T_J, T_{STG}	- 55 to +150	°C

Thermal Performance

Parameter	Symbol	Limit		Unit
		ITO220	TO-220	
Junction to Case Thermal Resistance	$R_{\theta JC}$	2.4	0.6	°C/W
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	65	62.5	°C/W

TSM13N50A

500V N-Channel MOSFET

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

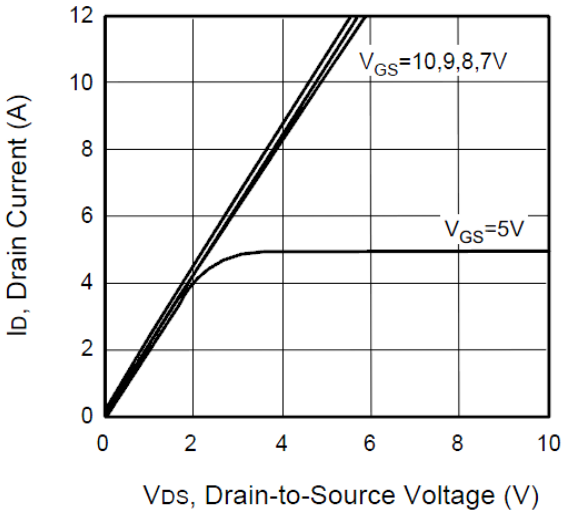
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static (Note 5)						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	BV_{DSS}	500	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	2	--	4	V
Gate Body Leakage	V_{GS} = ±30V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V_{DS} = 500V, V_{GS} = 0V	I_{DSS}	--	--	1	μA
Drain-Source On-State Resistance	V_{GS} = 10V, I_D =6.5A	$R_{DS(ON)}$	--	0.38	0.48	Ω
Dynamic (Note 6)						
Total Gate Charge	V_{DS} = 400V, I_D = 13A, V_{GS} = 10V	Q_g	--	31	40	nC
Gate-Source Charge		Q_{gs}	--	11	--	
Gate-Drain Charge		Q_{gd}	--	7	--	
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	1965	--	pF
Output Capacitance		C_{oss}	--	185	--	
Reverse Transfer Capacitance		C_{rss}	--	11	--	
Switching (Note 6)						
Turn-On Delay Time	V_{DD} = 200V, R_{GEN} = 25Ω, I_D = 13A, V_{GS} = 10V	$t_{d(on)}$	--	32	--	ns
Turn-On Rise Time		t_r	--	18	--	
Turn-Off Delay Time		$t_{d(off)}$	--	79	--	
Turn-Off Fall Time		t_f	--	16	--	
Source-Drain Diode						
Forward On Voltage	I_S=13A, V_{GS}=0V	V_{SD}	--	--	1.4	V

Notes:

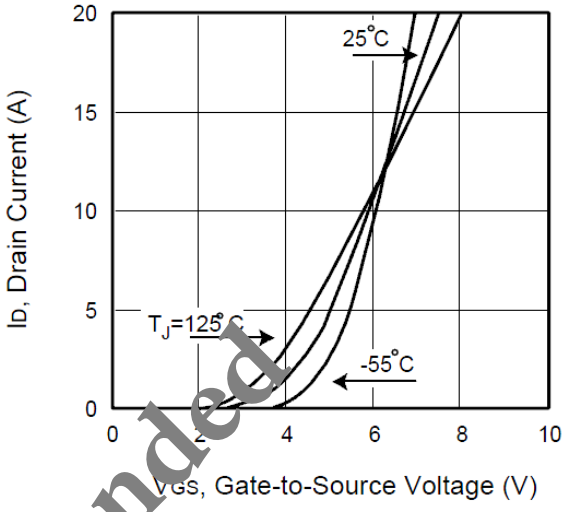
1. Current limited by package
2. Pulse width limited by the maximum junction temperature
3. Pulse width limited by safe operating area
4. L=15mH, I_{AS}=8.5A, V_{DD}=50V, R_G=25Ω , Starting T_J=25°C
5. Pulse test: pulse width ≤300μS, duty cycle ≤2%
6. Guaranteed by design, not subject to production testing.

Electrical Characteristics Curves

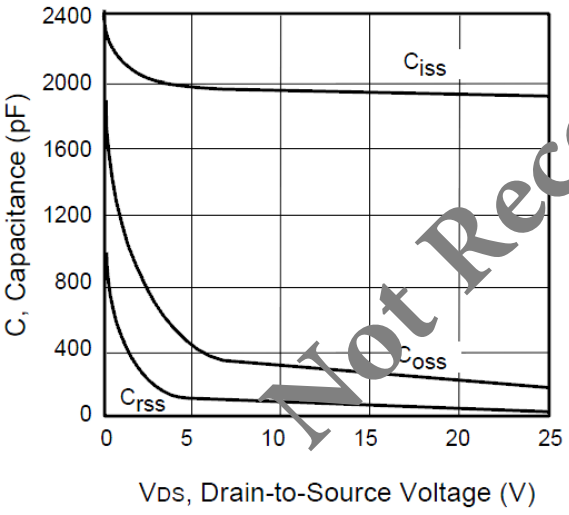
Output Characteristics



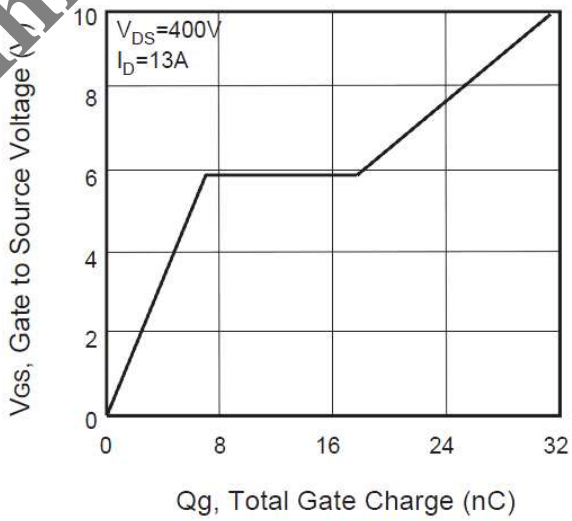
Transfer Characteristics



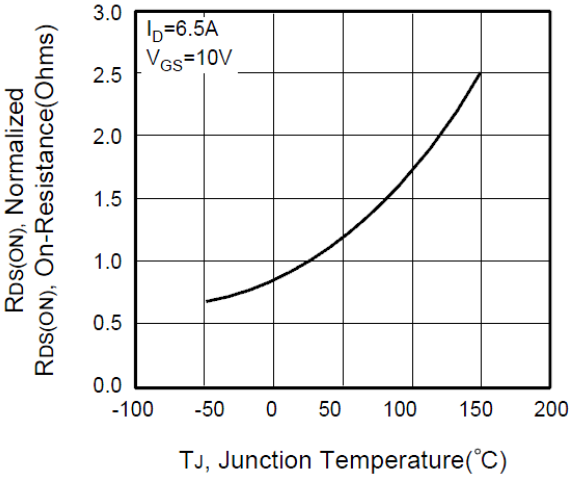
Capacitance



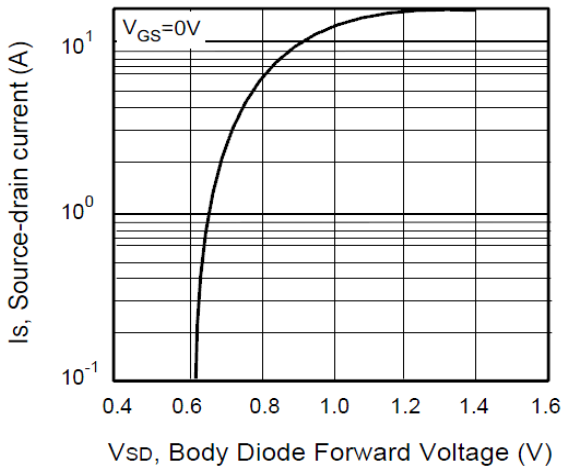
Gate Charge



On-Resistance vs. Junction Temperature

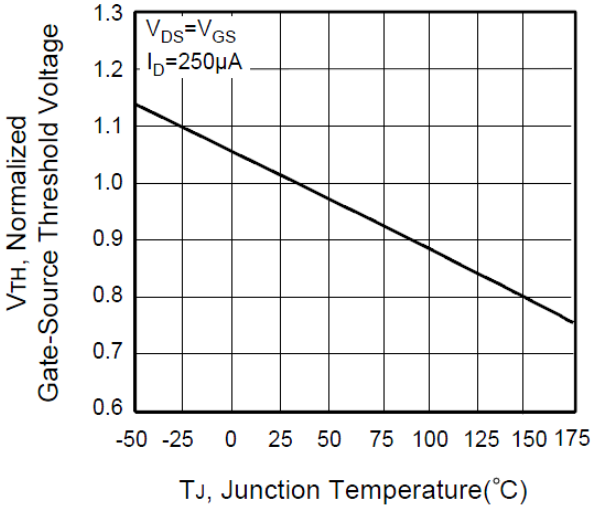


Source-Drain Diode Forward Voltage

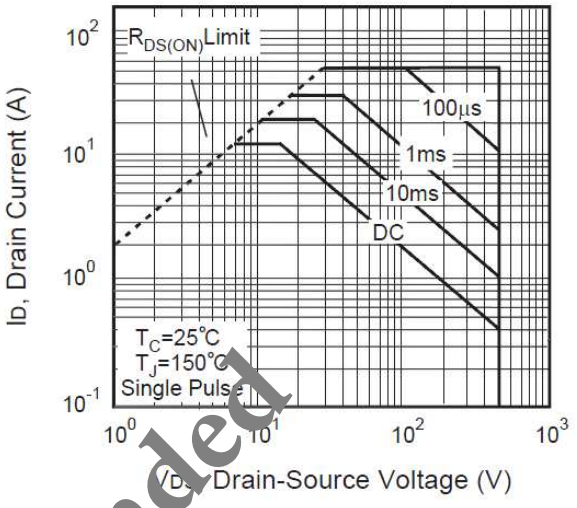


Electrical Characteristics Curves

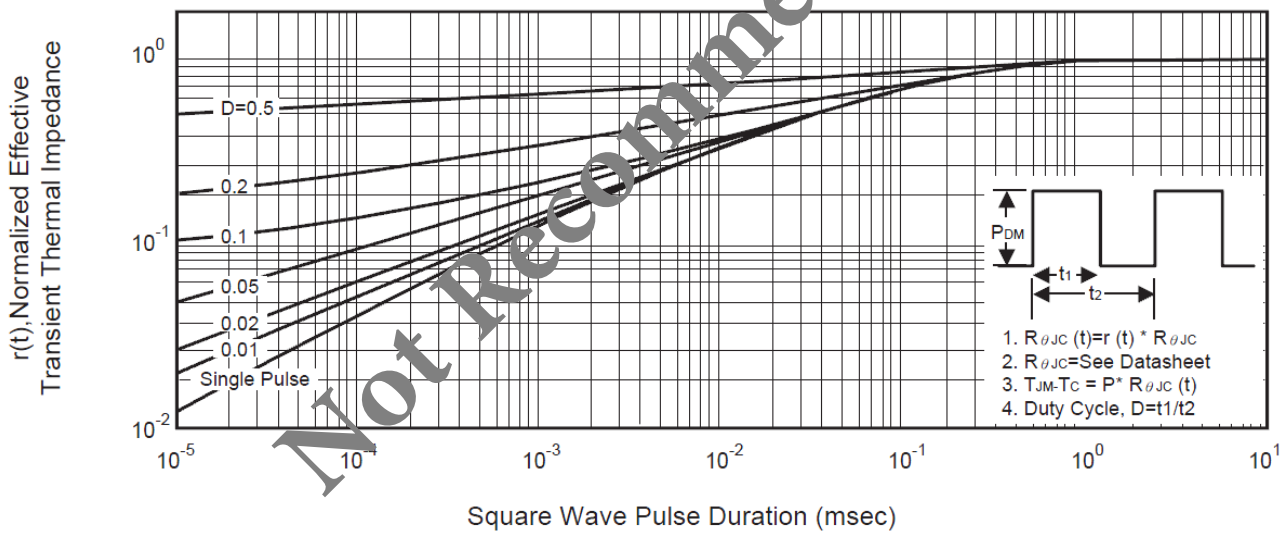
Threshold Voltage vs. Junction Temperature



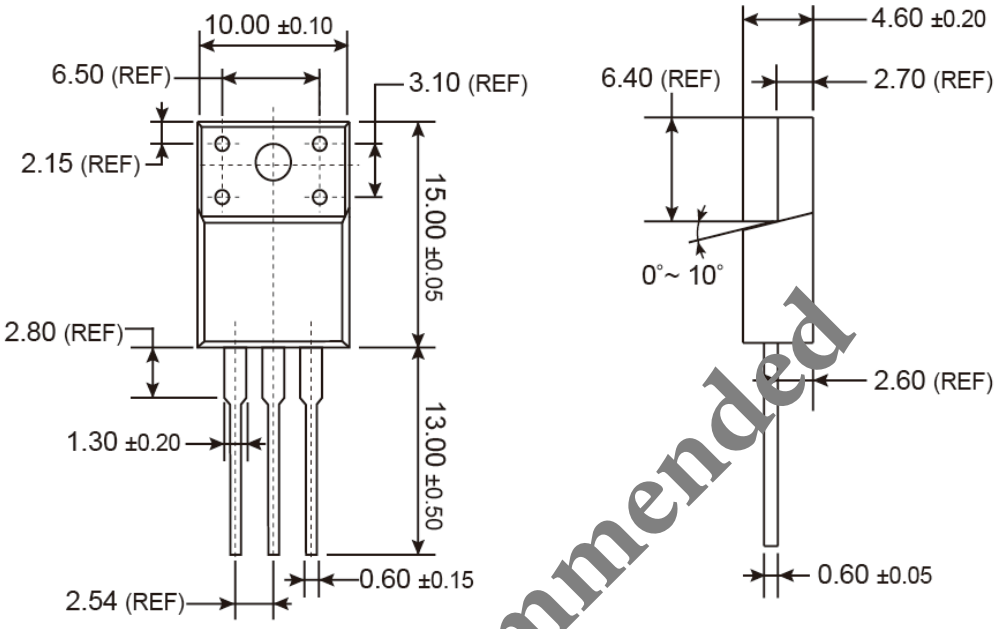
Maximum Safe Operating Area



Normalized Thermal Transient Impedance Curve

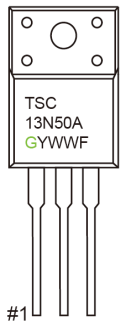


ITO-220 Mechanical Drawing



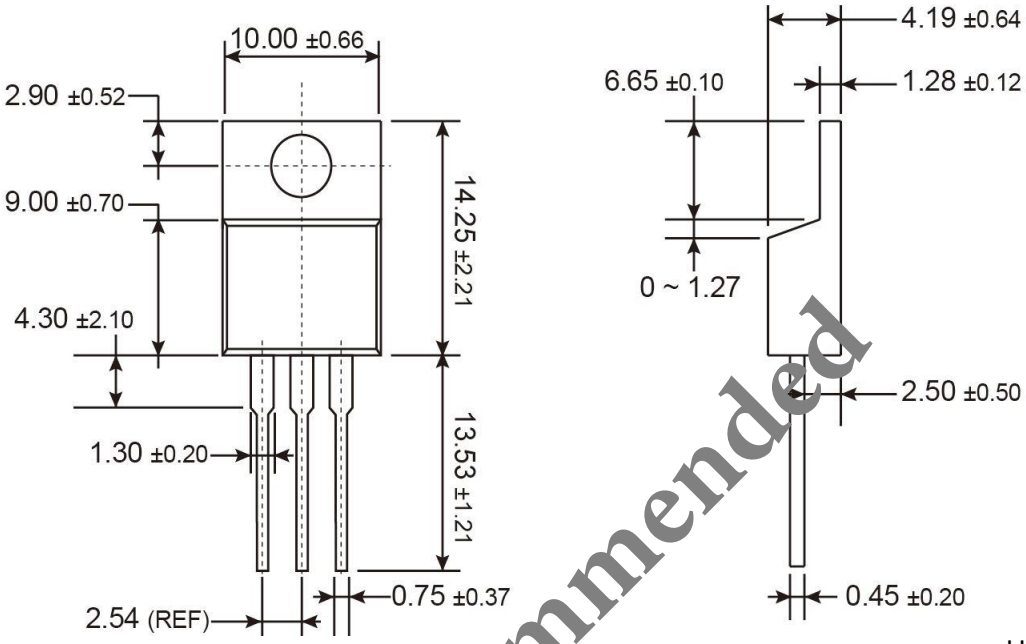
Unit: Millimeters

Marking Diagram



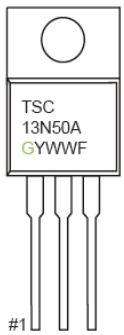
G = Halogen Free
Y = Year Code
WW = Week Code (01~52)
F = Factory Code

TO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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

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.