



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!



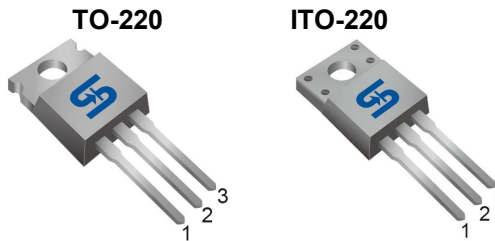
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Pin Definition:

1. Gate
2. Drain
3. Source

Key Parameter Performance

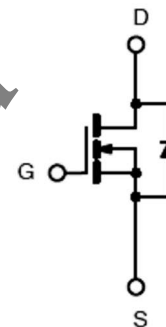
Parameter	Value	Unit
V_{DS}	600	V
$R_{DS(on)}$ (max)	1.6	
Q_g	18.3	nC

Ordering Information

Part No.	Package	Packing
TSM6NB60CZ C0G	TO-220	50pcs / Tube
TSM6NB60CI 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

Block Diagram



N-Channel MOSFET

Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$ 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 (Note 1)	I_D	$T_C = 25^\circ\text{C}$		A
		$T_C = 100^\circ\text{C}$		
Pulsed Drain Current (Note 2)	I_{DM}	24		A
Total Power Dissipation @ $T_C=25^\circ\text{C}$	P_{DTOT}	125	40	W
Single Pulsed Avalanche Energy (Note 3)	E_{AS}	83		mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to +150		$^\circ\text{C}$

Thermal Performance

Parameter	Symbol	Limit		Unit
Junction to Case Thermal Resistance	$R_{\theta JC}$	1	3.1	$^\circ\text{C/W}$
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	62.5	65	$^\circ\text{C/W}$



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

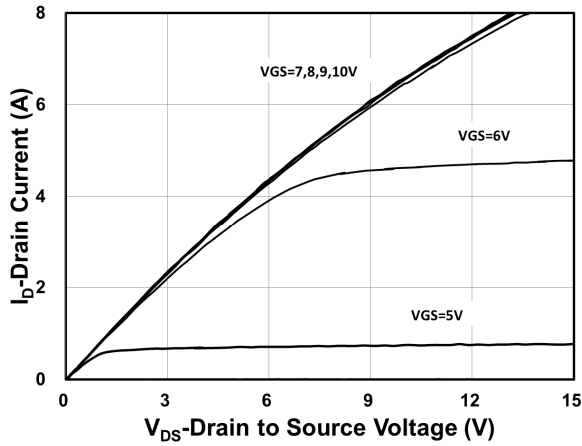
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static (Note 4)						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	BV _{DSS}	600	--	--	V
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	V _{GS(TH)}	2.5	3.6	4.5	V
Gate Body Leakage	V _{GS} = ±30V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = 600V, V _{GS} = 0V	I _{DSS}	--	--	10	μA
Drain-Source On-State Resistance	V _{GS} = 10V, I _D = 3A	R _{DS(on)}	--	1.12	1.6	
Dynamic (Note 5,6)						
Total Gate Charge	V _{DS} = 480V, I _D = 6A, V _{GS} = 10V	Q _g	--	18.3	--	nC
Gate-Source Charge		Q _{gs}	--	5.26	--	
Gate-Drain Charge		Q _{gd}	--	6.84	--	
Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	872	--	pF
Output Capacitance		C _{oss}	--	104	--	
Reverse Transfer Capacitance		C _{rss}	--	15	--	
Switching (Note 5,6)						
Turn-On Delay Time	V _{DD} = 30V, R _{GEN} = 25 , I _D = 6A, V _{GS} = 10V,	t _{d(on)}	--	23	--	ns
Turn-On Rise Time		t _r	--	9.4	--	
Turn-Off Delay Time		t _{d(off)}	--	35.6	--	
Turn-Off Fall Time		t _f	--	6.8	--	
Source-Drain Diode						
Forward On Voltage	I _S = 6A, V _{GS} = 0V	V _{SD}	--	--	1.4	V

Notes:

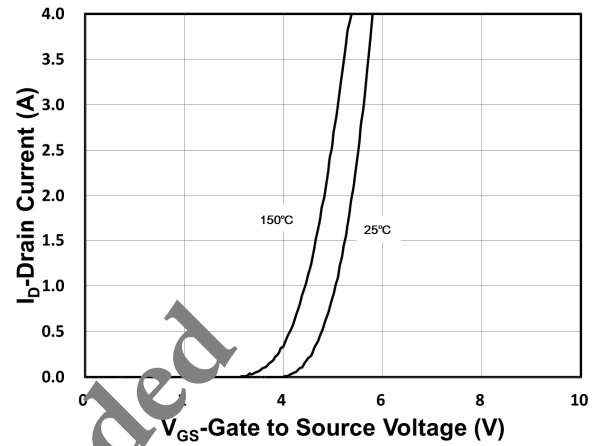
1. Current limited by package
2. Pulse width limited by the maximum junction temperature
3. L = 10mH, I_{AS} = 3.9A, V_{DD} = 50V, R_G = 25| , Starting T_J = 25°C
4. Pulse test: PW ≐ 300μs, duty cycle ≐ 2%
5. For DESIGN AID ONLY, not subject to production testing.
6. Switching time is essentially independent of operating temperature.

Electrical Characteristics Curves

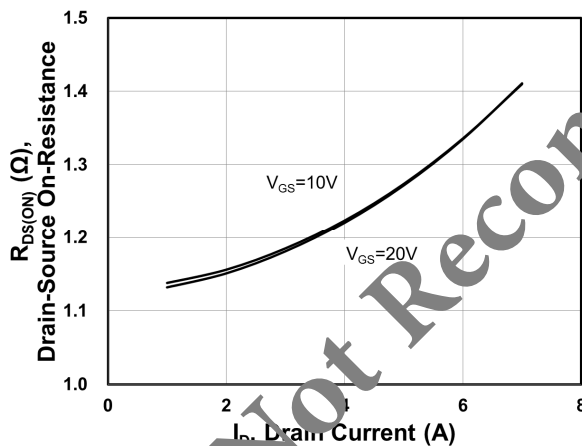
Output Characteristics



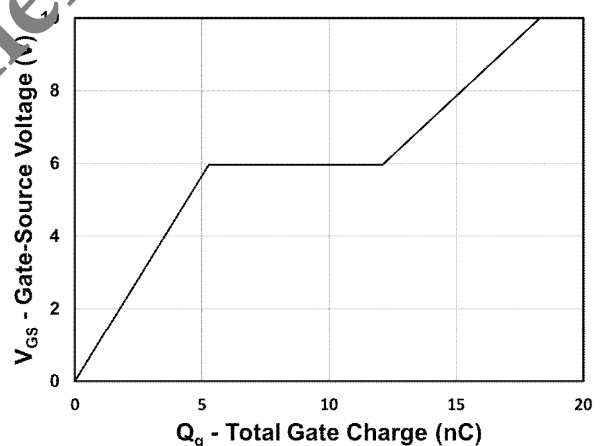
Transfer Characteristics



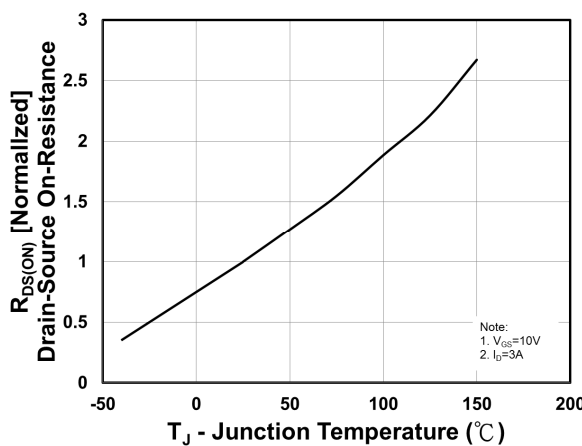
On-Resistance vs. Drain Current



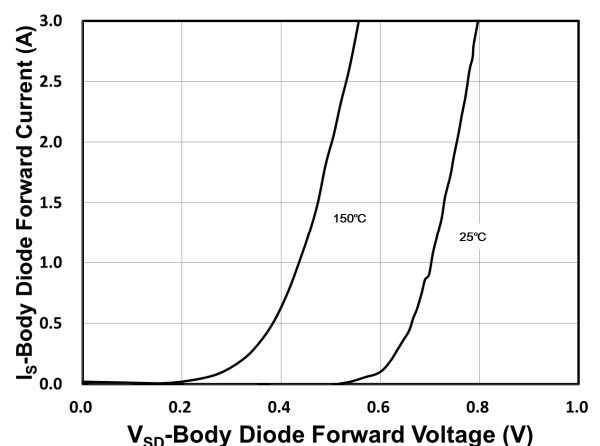
Gate-Source Voltage vs. Gate Charge



On-Resistance vs. Junction Temperature

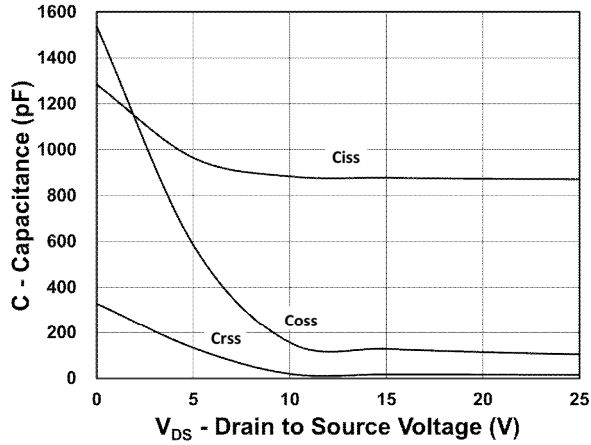


Source-Drain Diode Forward Current vs. Voltage

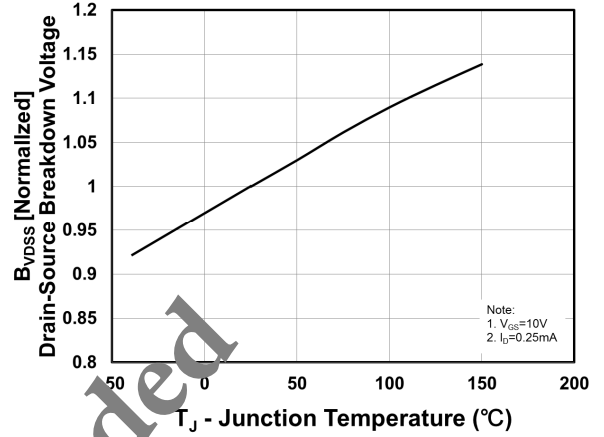


Electrical Characteristics Curves

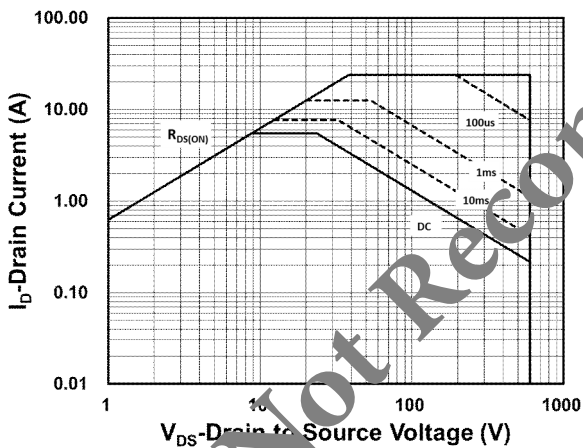
Capacitance vs. Drain-Source Voltage



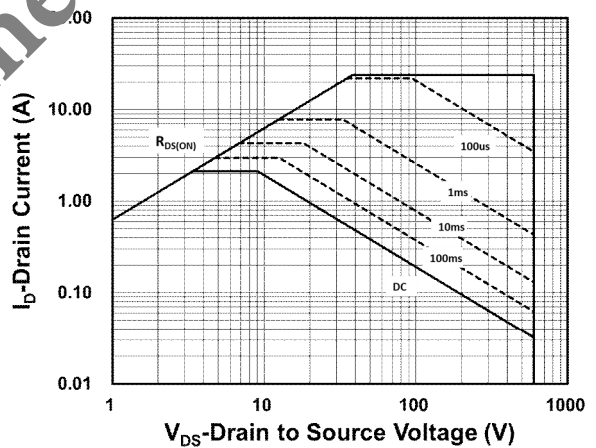
BV_{DSS} vs. Junction Temperature



Maximum Safe Operating Area (TO-220)



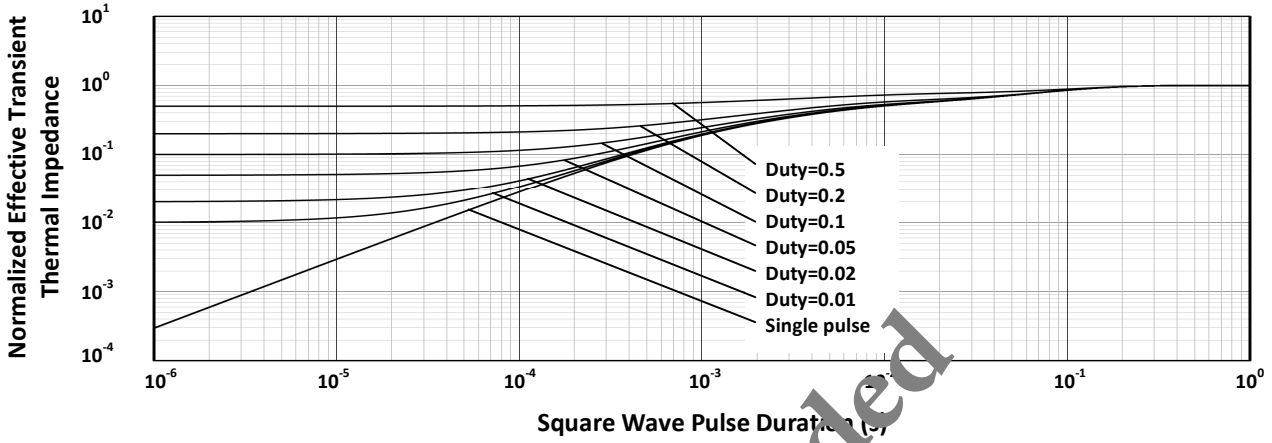
Maximum Safe Operating Area (ITO-220)



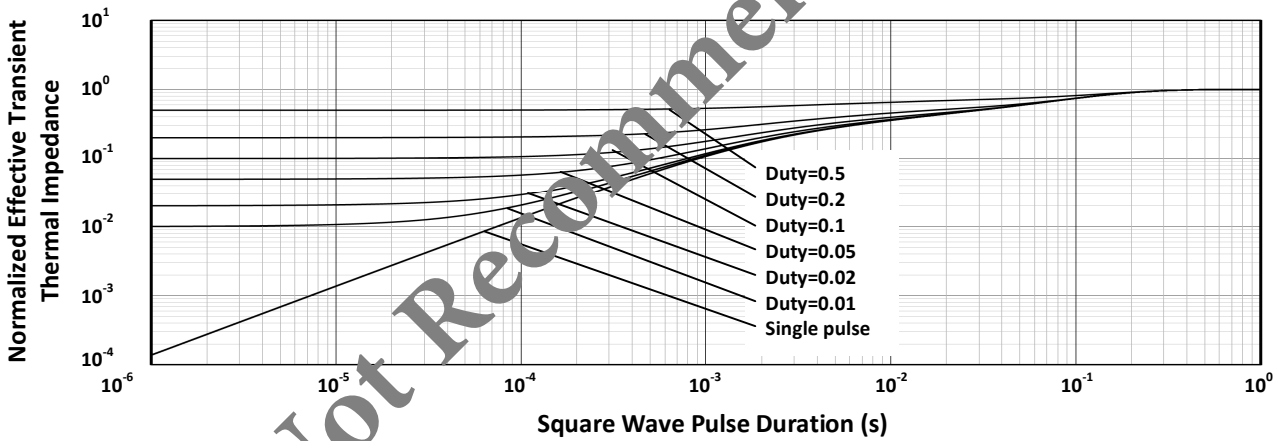


Electrical Characteristics Curves

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



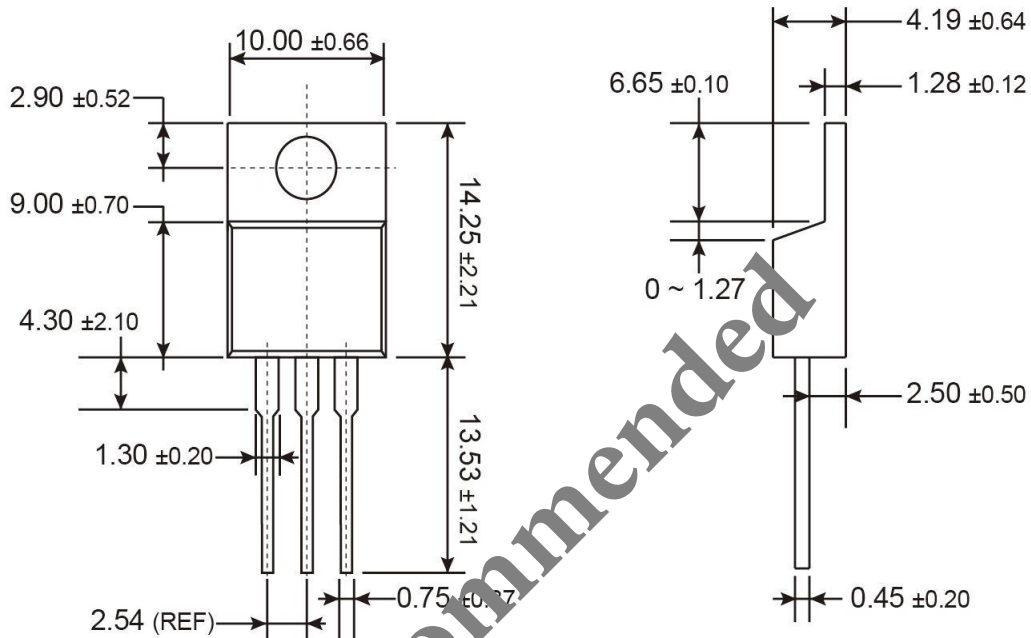
Normalized Thermal Transient Impedance, Junction-to-Case (ITO-220)



Not Recommended

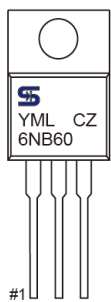


TO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram

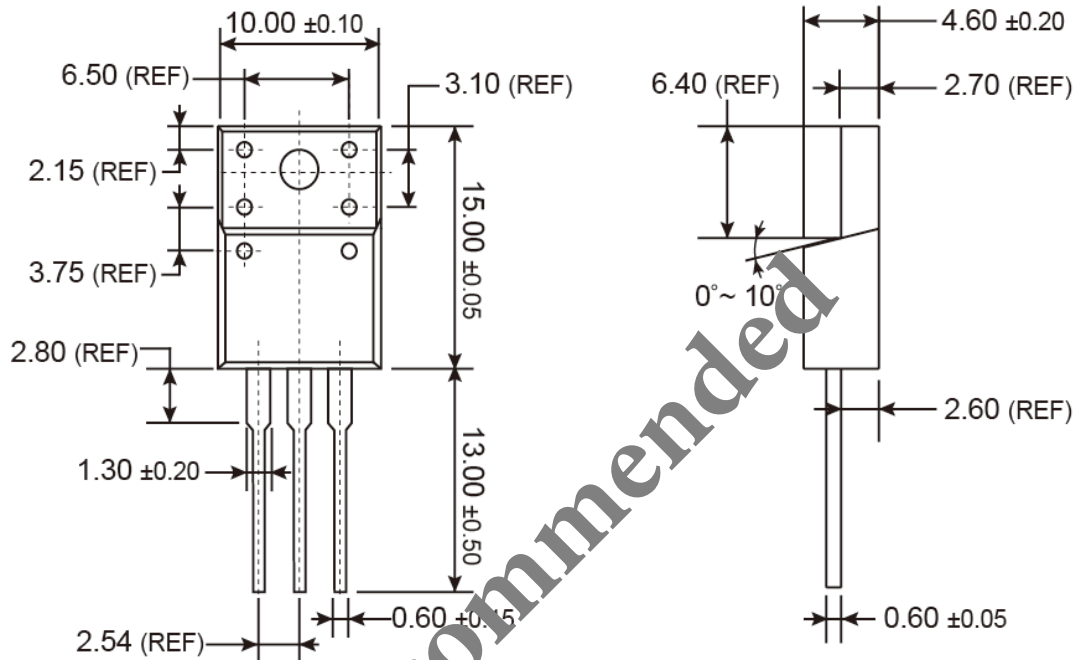


- Y** = Year Code
- M** = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apr, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)
- L** = Lot Code

Not Recommended

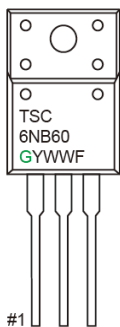


ITO-220 Mechanical Drawing



Unit: Millimeters

Marking Diagram



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

Not Recommended

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