

TO-220



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
60	6.7 @ $V_{GS}=10V$	100

Features

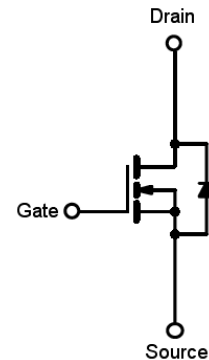
- Advanced Trench Technology
- Low $R_{DS(ON)}$ 6.7m Ω (Max.)
- Low gate charge typical @ 81nC (Typ.)
- Low C_{rss} typical @ 339pF (Typ.)

Ordering Information

Part No.	Package	Packing
TSM100N06CZ C0G	TO-220	50pcs / Tube

Note: "G" denote for Halogen Free Product

Block Diagram



N-Channel MOSFET

Absolute Maximum Rating ($T_a = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ C$	100 ⁽³⁾
		$T_C=70^\circ C$	80
		$T_A=25^\circ C$	14
		$T_A=70^\circ C$	11
Drain Current-Pulsed Note 1	I_{DM}	400	A
Avalanche Current, L=0.1mH	I_{AS}	71	A
Avalanche Energy, L=0.1mH	E_{AS}, E_{AR}	400	mJ
Maximum Power Dissipation	P_D	$T_C=25^\circ C$	167
		$T_C=70^\circ C$	107
		$T_A=25^\circ C$	2
		$T_A=70^\circ C$	1.3
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ C$

* Limited by maximum junction temperature

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta_{JC}}$	0.8	$^\circ C/W$
Thermal Resistance - Junction to Ambient	$R_{\theta_{JA}}$	62.5	$^\circ C/W$

Notes: Surface mounted on FR4 board $t \leq 10sec$

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

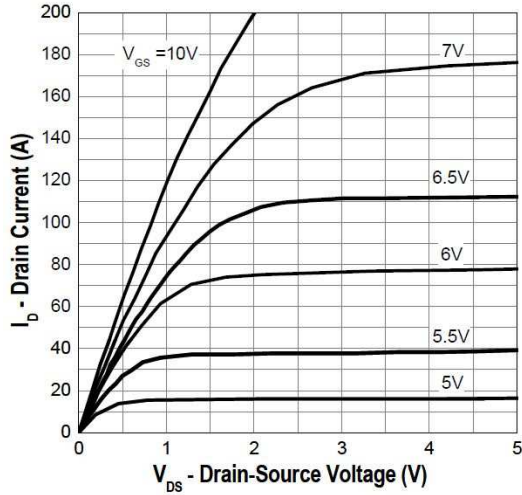
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	60	--	--	V
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 30A$	$R_{DS(ON)}$	--	5.7	6.7	mΩ
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	2	3	4	V
Zero Gate Voltage Drain Current	$V_{DS} = 48V, V_{GS} = 0V$	I_{DSS}	--	--	1	μA
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	±100	nA
Dynamic						
Total Gate Charge	$V_{DS} = 30V, I_D = 30A,$ $V_{GS} = 10V$	Q_g	--	81	--	nC
Gate-Source Charge		Q_{gs}	--	23	--	
Gate-Drain Charge		Q_{gd}	--	24	--	
Input Capacitance	$V_{DS} = 30V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	4382	--	pF
Output Capacitance		C_{oss}	--	668	--	
Reverse Transfer Capacitance		C_{rss}	--	339	--	
Switching						
Turn-On Delay Time	$V_{GS} = 10V, V_{DS} = 30V,$ $R_G = 3.3\Omega$	$t_{d(on)}$	--	25	--	nS
Turn-On Rise Time		t_r	--	19	--	
Turn-Off Delay Time		$t_{d(off)}$	--	85	--	
Turn-Off Fall Time		t_f	--	43	--	
Drain-Source Diode Characteristics and Maximum Rating						
Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	V_{SD}	-	0.8	1.3	V
Reverse Recovery Time	$I_S = 30A, T_J=25^\circ C$ $di/dt = 100A/\mu s$	t_{fr}		36		nS
Reverse Recovery Charge		Q_{fr}		53		nC

Notes:

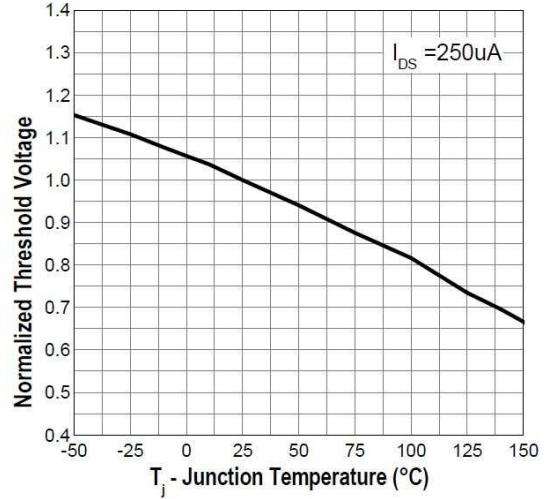
1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. $R_{\theta JA}$ shown below for single device operation on FR-4 in still air
3. Calculated continuous current based on maximum allowable junction temperature, Package limitation current is 75A

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

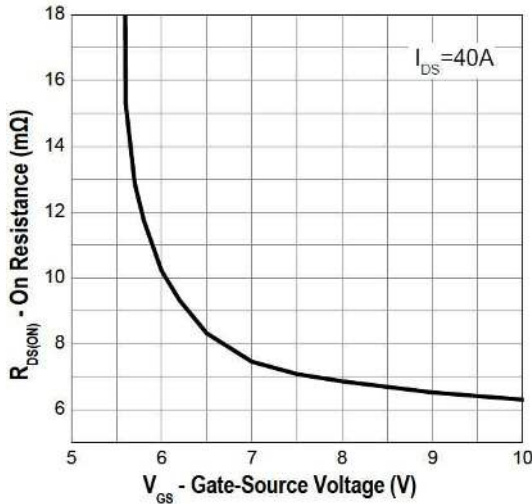
Output Characteristics



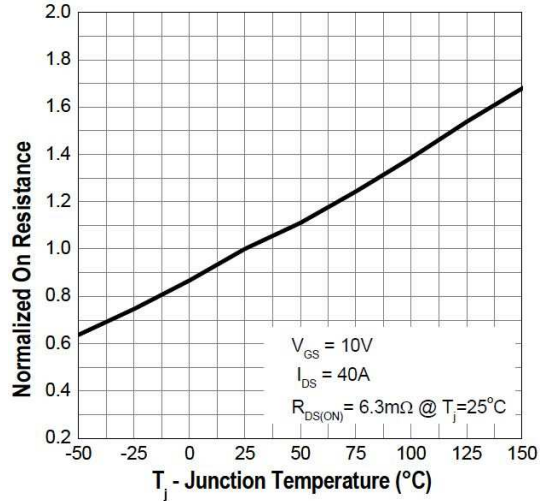
Gate Threshold Voltage



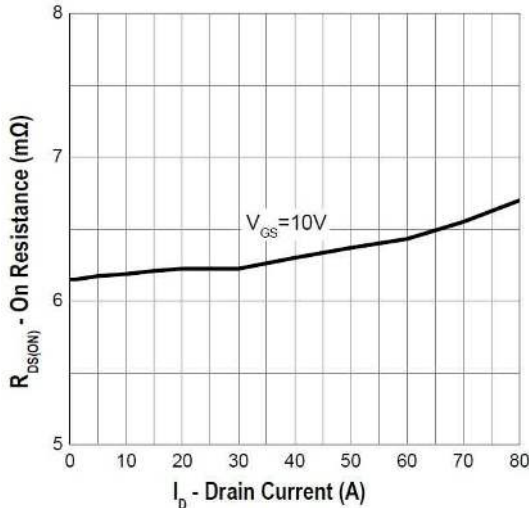
Gate Source On Resistance



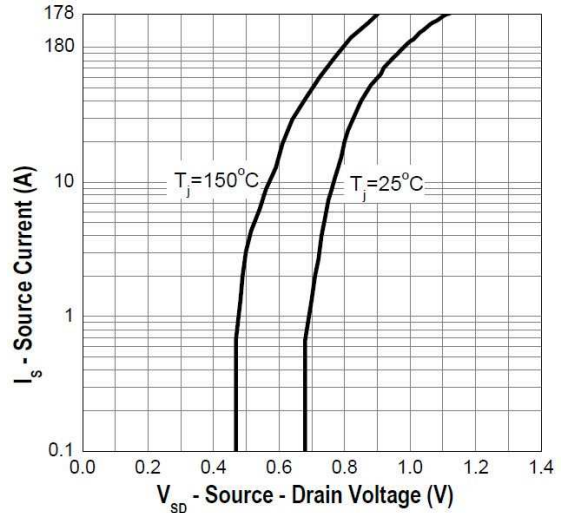
Drain-Source On Resistance



Drain-Source On-Resistance

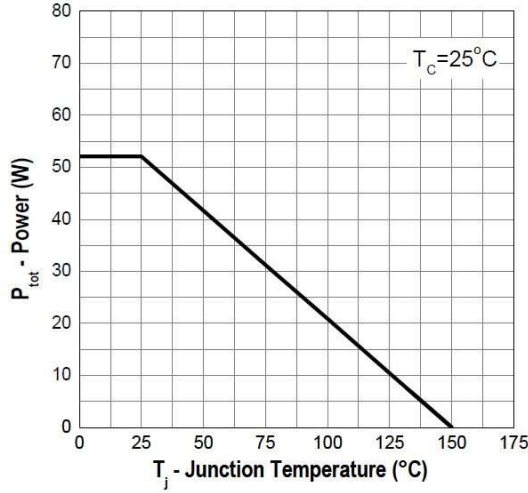


Source-Drain Diode Forward Voltage

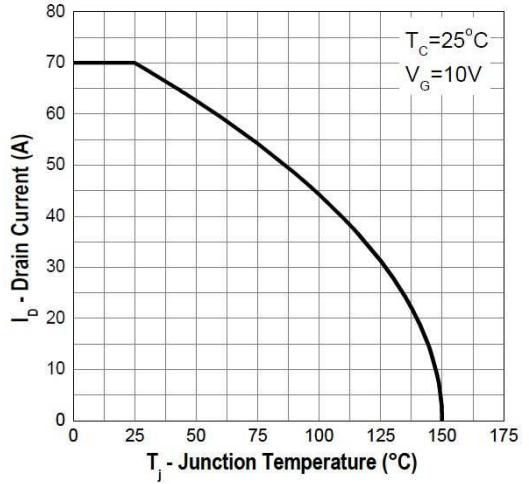


Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

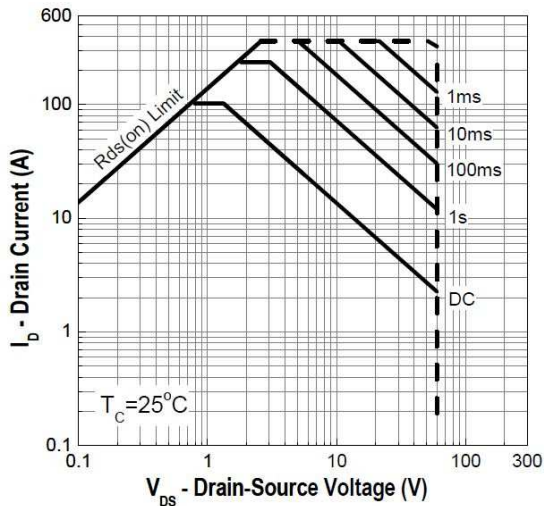
Power Derating



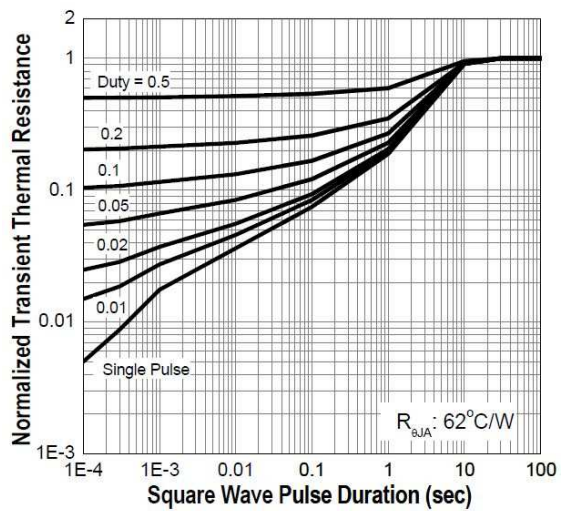
Drain Current vs. Junction Temperature



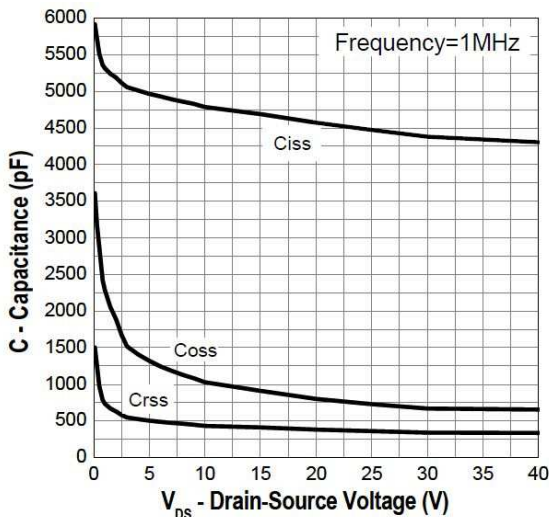
Safe Operation Area



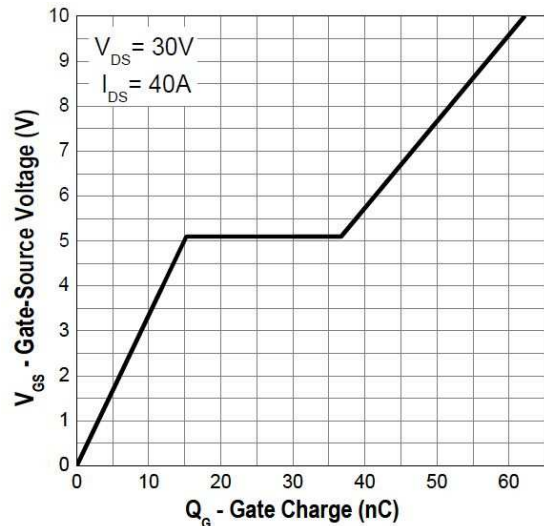
Transient Thermal Impedance



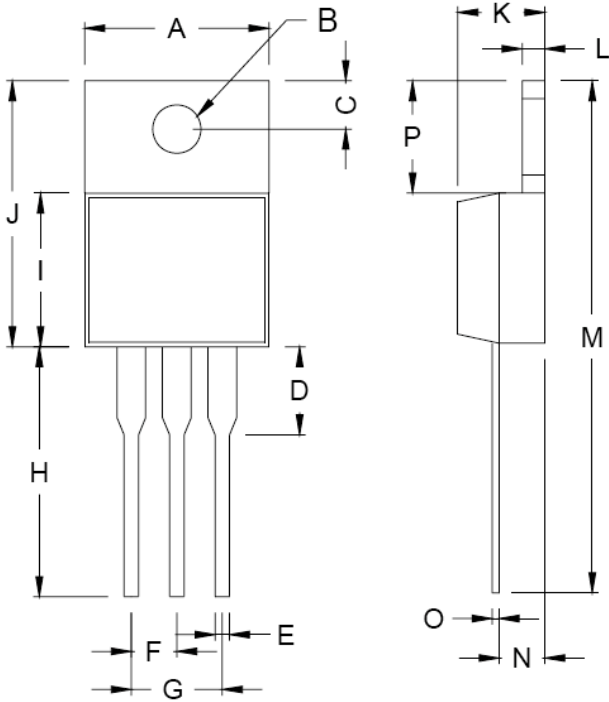
Capacitance



Gate Charge



TO-220 Mechanical Drawing



TO-220 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	10.000	10.500	0.394	0.413
B	3.740	3.910	0.147	0.154
C	2.440	2.940	0.096	0.116
D	-	6.350	-	0.250
E	0.381	1.106	0.015	0.040
F	2.345	2.715	0.092	0.058
G	4.690	5.430	0.092	0.107
H	12.700	14.732	0.500	0.581
J	14.224	16.510	0.560	0.650
K	3.556	4.826	0.140	0.190
L	0.508	1.397	0.020	0.055
M	27.700	29.620	1.060	1.230
N	2.032	2.921	0.080	0.115
O	0.255	0.610	0.010	0.024
P	5.842	6.858	0.230	0.270

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.