

P-Channel Enhancement Mode MOSFET

TDM2301

Features

- -20V/-3A ,
 $R_{DS(ON)} = 72m\Omega (typ.) @ V_{GS} = -4.5V$
 $R_{DS(ON)} = 98m\Omega (typ.) @ V_{GS} = -2.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

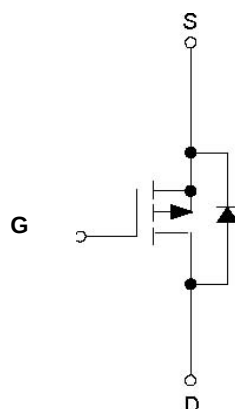
Applications

- Power Management in Notebook Computer , Portable Equipment and Battery Powered Systems.

Pin Description



Top View of SOT23-3L



P-Channel MOSFET

Ordering and Marking Information

TDM2301 □ □ - □ □ □ □ Lead Free Code □ Handling Code □ Temp. Range □ Package Code	Package Code A: SOT23-3L Operating Junction Temp. Rang C: -55 to 150°C Handling Code TU:Tube TR:Tape & Reel Lead Free Code: L:Lead Free Device Blank:Original Device
TDM2301 T01 X	X:Date Code

Note: TECHCODE lead-free products contain molding compounds/die attach materials and 100% matte in plate termination finish; which are fully compliant with RoHS and compatible with both SnPb and lead-free soldering operations. TECHCODE lead-free products meet or exceed the lead-free requirements of IPC/JEDEC J STD-020C for MSL classification at lead-free peak reflow temperature.

TECHCODE reserves the right to make changes to improve reliability or manufacturability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

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Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter		Rating	Unit
VDSS	Drain-Source Voltage		-20	V
VGSS	Gate-Source Voltage		± 12	
ID*	Continuous Drain Current		-3	A
IDM*	300 μs Pulsed Drain Current	VGS=-4.5V	-10	
IS*	Diode Continuous Forward Current		-1	A
TJ	Maximum Junction Temperature		150	$^\circ\text{C}$
TSTG	Storage Temperature Range		-55 to 150	
PD*	Maximum Power Dissipation	TA=25 $^\circ\text{C}$	0.83	W
		TA=100 $^\circ\text{C}$	0.3	
R θ JA*	Thermal Resistance-Junction to Ambient		150	$^\circ\text{C/W}$

Note: *

Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$.Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

			TDM2301			
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V , V _{GS} =0V T _J =85°C			-1 -30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-0.6	-1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V			±100	nA
R _{DS(ON)} a	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-3A		72	90	mΩ
		V _{GS} =-2.5V, I _{DS} =-2A		98	115	
V _{SD} a	Diode Forward Voltage	I _{SD} =-1.25A, V _{GS} =0V		-0.7	-1.3	V
Gate Charge Characteristics b						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _{DS} =-3A		9	12	
Q _{gs}	Gate-Source Charge			3		nC
Q _{gd}	Gate-Drain Charge			1.2		

Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Condition	TDM2301			Unit
			Min.	Typ.	Max.	
Dynamic Characteristics ^b						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		11		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, Frequency=1.0MHz		550		PF
C _{oss}	Output Capacitance			120		
C _{rss}	Reverse Transfer Capacitance			80		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =10Ω, I _{DS} =-1A, V _{GEN} =-4.5V, R _G =6Ω		13	24	Ns
T _r	Turn-on Rise Time			36	66	
t _{d(OFF)}	Turn-off Delay Time			45	82	
T _f	Turn-off Fall Time			37	68	

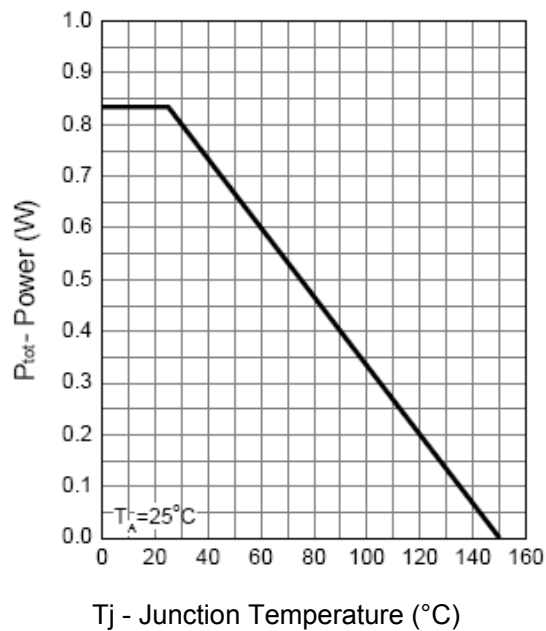
Notes:

a : Pulse test ; pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

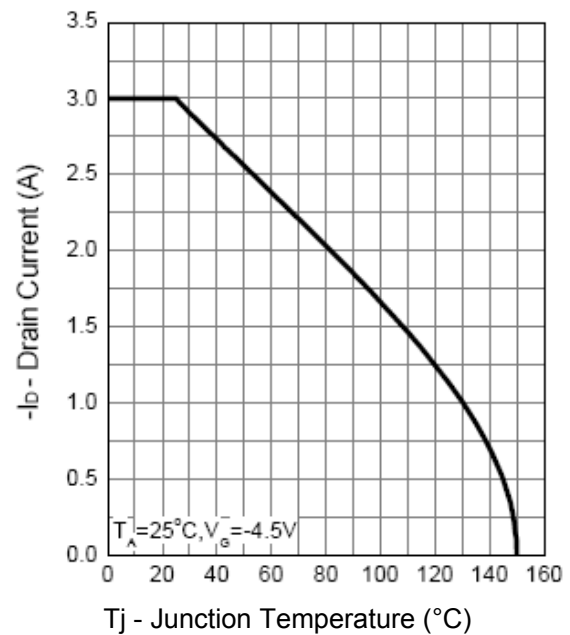
b : Guaranteed by design, not subject to production testing.

Typical Characteristics

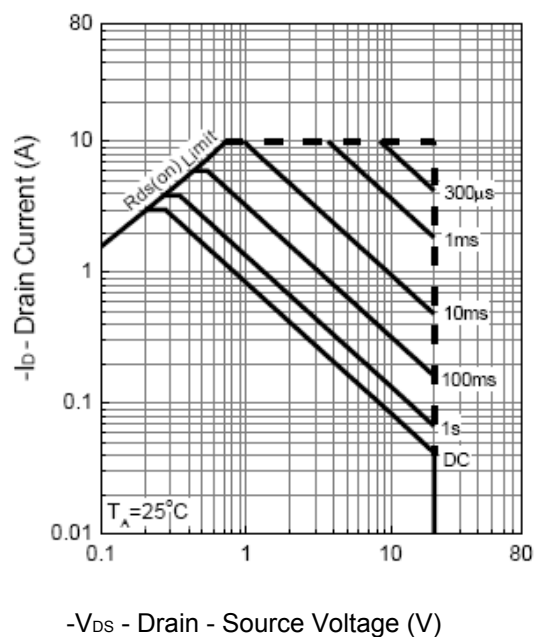
Power Dissipation



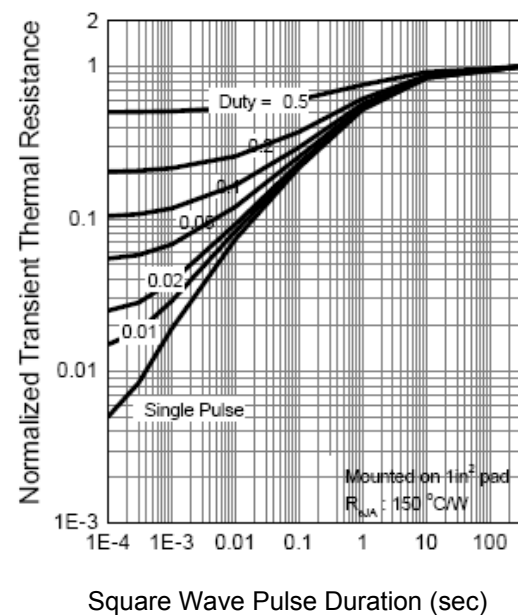
Drain Current



Safe Operation Area

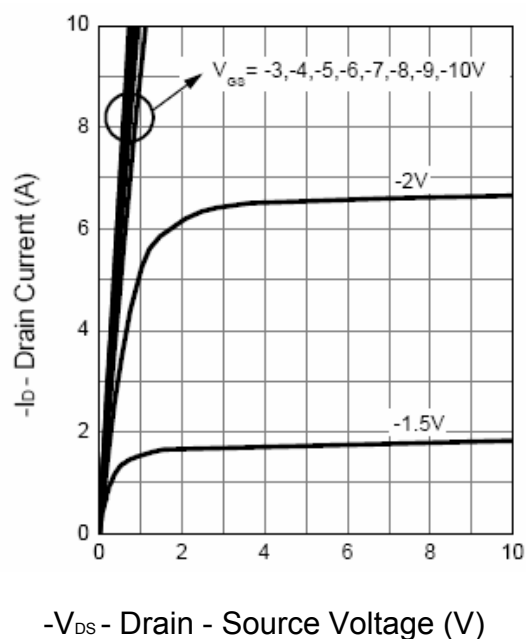


Thermal Transient Impedance

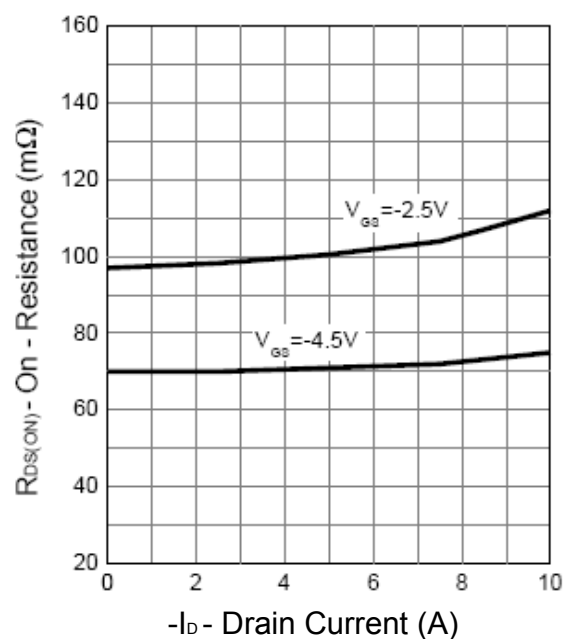


Typical Characteristics (Cont.)

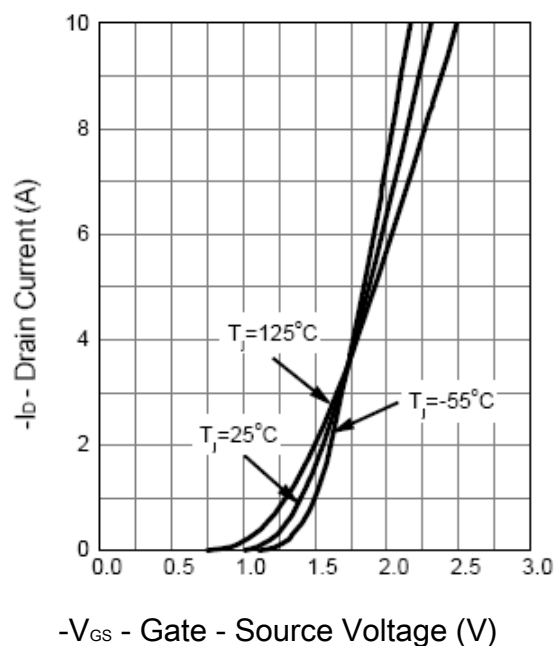
Output Characteristics



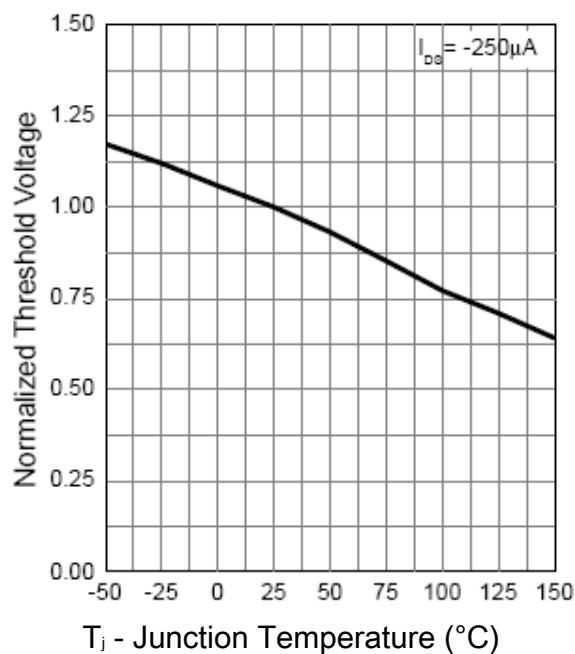
Drain-Source On Resistance



Transfer Characteristics

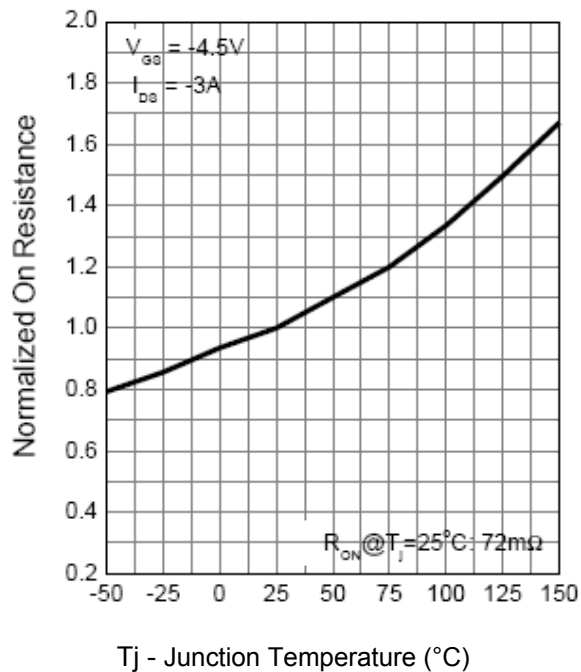


Gate Threshold Voltage

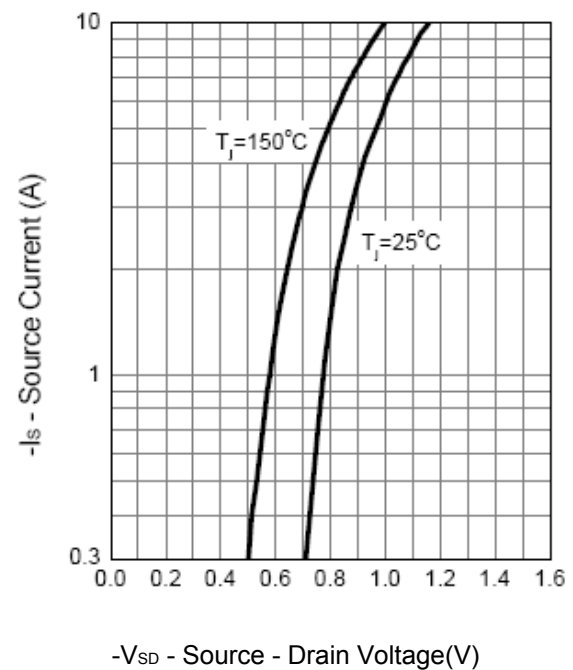


Typical Characteristics (Cont.)

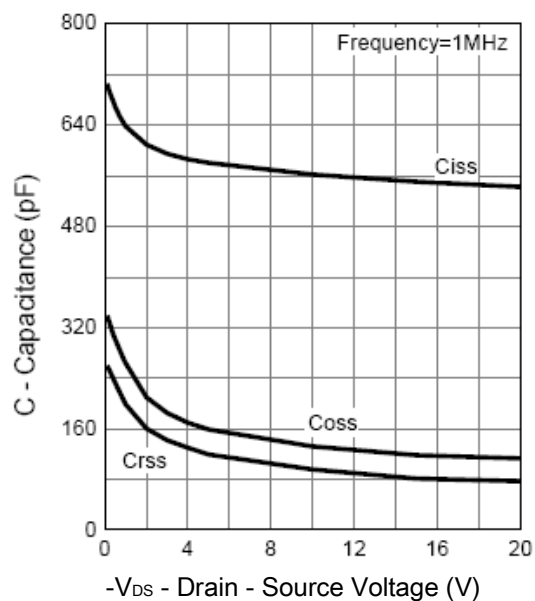
Drain-Source On Resistance



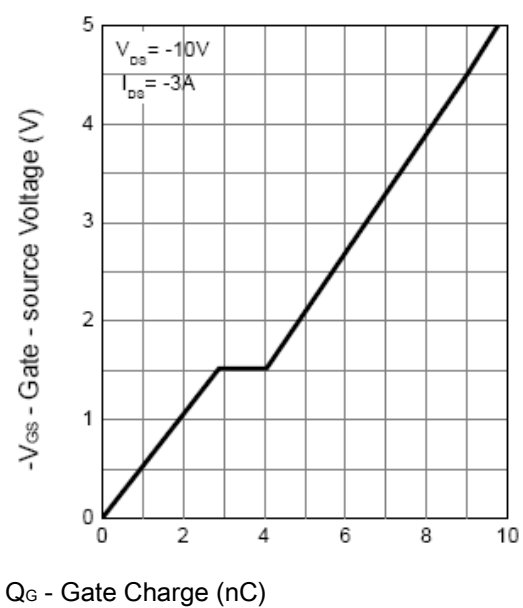
Source-Drain Diode Forward



Capacitance

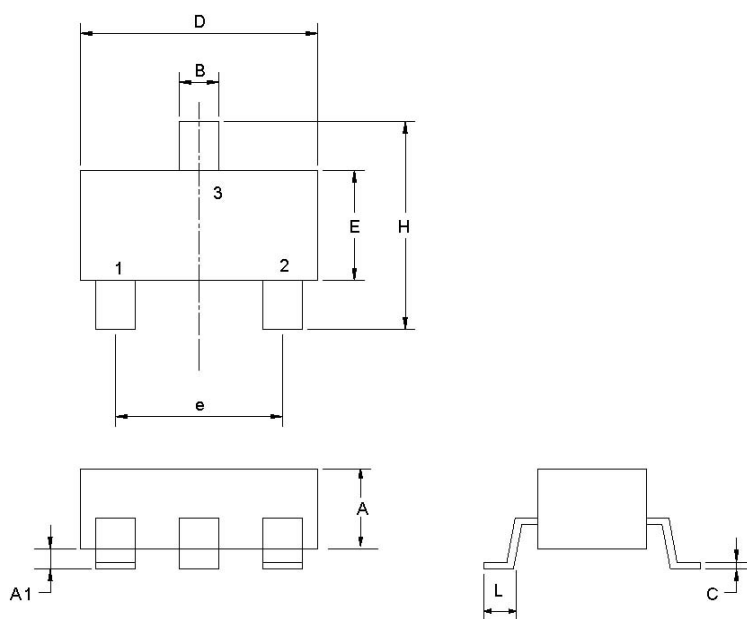


Gate Charge



Packaging Information

SOT23-3L



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.00	1.30	0.039	0.051
A1	0.00	0.10	0.000	0.004
B	0.35	0.51	0.014	0.020
C	0.10	0.25	0.004	0.010
D	2.70	3.10	0.106	0.122
E	1.40	1.80	0.055	0.071
e	1.90/2.1 BSC.		0.075/0.083 BSC.	
H	2.40	3.00	0.094	0.118
L	0.37		0.015	