

N-Channel Enhancement Mode MOSFET

TDM2302

Features

- 20V/5A ,
- $R_{DS(ON)} = 20m\Omega(\text{typ.}) @ V_{GS} = 4.5V$
- $R_{DS(ON)} = 40m\Omega(\text{typ.}) @ V_{GS} = 2.5V$
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

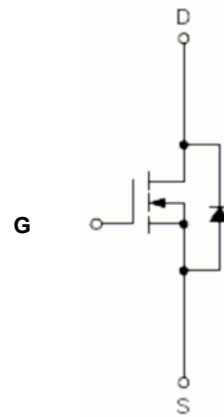
Applications

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

Pin Description



Top View of SOT23-3L



N-Channel MOSFET

Ordering and Marking Information

	Package Code A: SOT23-3L Operating Junction Temp. Rang C: -55 to 150°C Handing Code TU:Tube TR:Tape & Reel Lead Free Code: L:Lead Free Device Blank:Original Device
TDM2302 M24 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		± 10	
ID*	Continuous Drain Current		5	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	$^\circ\text{C}/\text{W}$

Note: *

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

Symbol	Parameter	Test Condition	TDM2302			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250 μA	20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V			1	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250 μA	0.5	0.7	1	V
I _{GSS}	Gate Leakage Current	V _{GS} = $\pm 10\text{V}$, V _{DS} =0V			± 100	nA
R _{DS(ON)} a	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =3A		20	40	m Ω
		V _{GS} =2.5V, I _{DS} =2A		40	75	
V _{SD} a	Diode Forward Voltage	I _{SD} =0.55A, V _{GS} =0V		-0.5	-1.3	V
Gate Charge Characteristics b						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =3A		5	6.5	
Q _{gs}	Gate-Source Charge			0.7		nC
Q _{gd}	Gate-Drain Charge			0.7		

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

Symbol	Parameter	Test Condition	TDM2302			Unit
			Min.	Typ.	Max.	
Dynamic Characteristics^b						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$		5		Ω
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V,$ Frequency=1.0MHz		255		PF
C_{oss}	Output Capacitance			70		
C_{rss}	Reverse Transfer Capacitance			50		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-10V, R_L=10\Omega,$ $I_{DS}=1A, V_{GEN}=4.5V,$ $R_G=6\Omega$		6	15	ns
T_r	Turn-on Rise Time			5	11	
$t_{d(OFF)}$	Turn-off Delay Time			12	24	
T_f	Turn-off Fall Time			6	15	

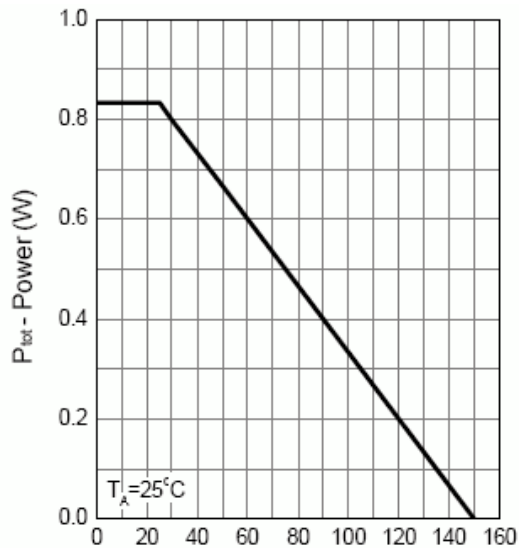
Notes:

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

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

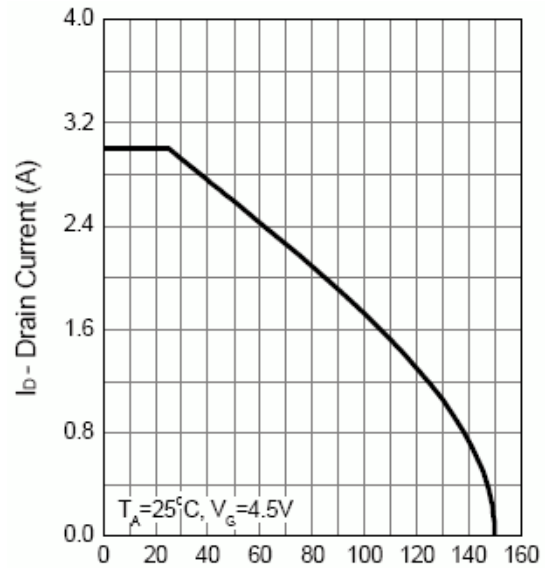
Typical Characteristics

Power Dissipation



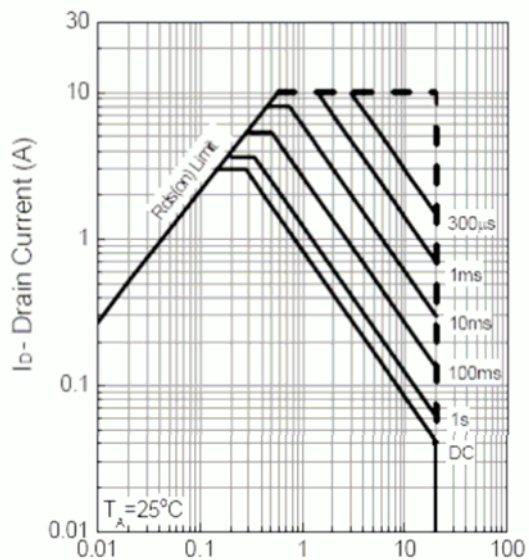
T_j - Junction Temperature (°C)

Drain Current



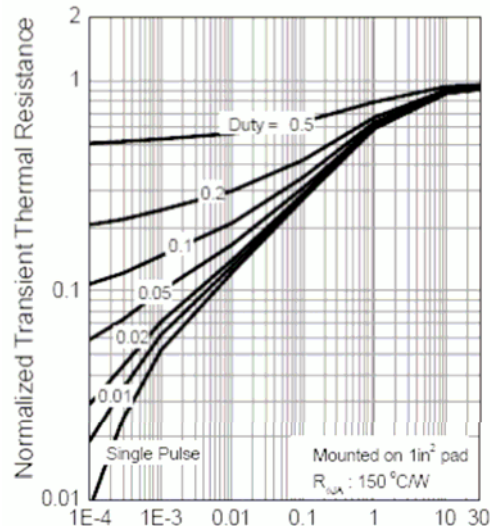
T_j - Junction Temperature (°C)

Safe Operation Area



V_{DS} - Drain - Source Voltage (V)

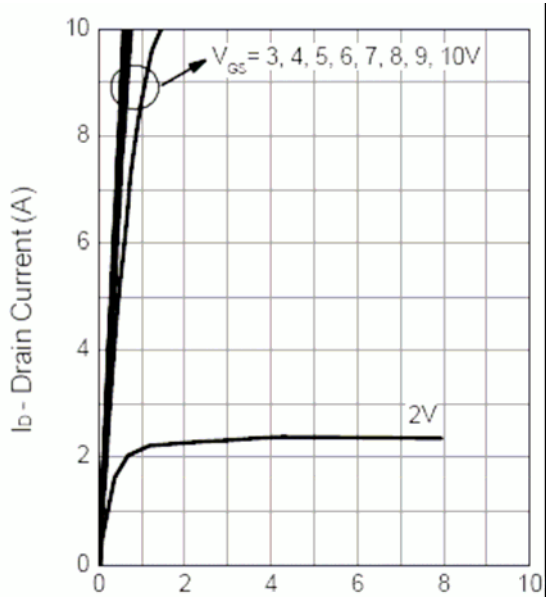
Thermal Transient Impedance



Square Wave Pulse Duration (sec)

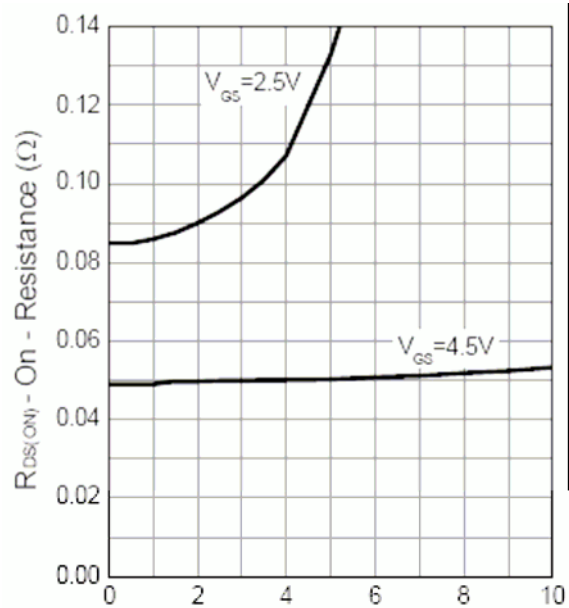
Typical Characteristics (Cont.)

Output Characteristics



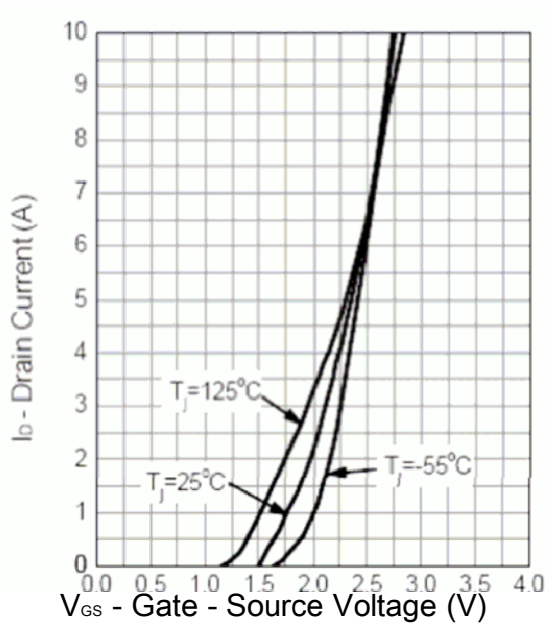
V_{DS} - Drain - Source Voltage (V)

Drain-Source On Resistance



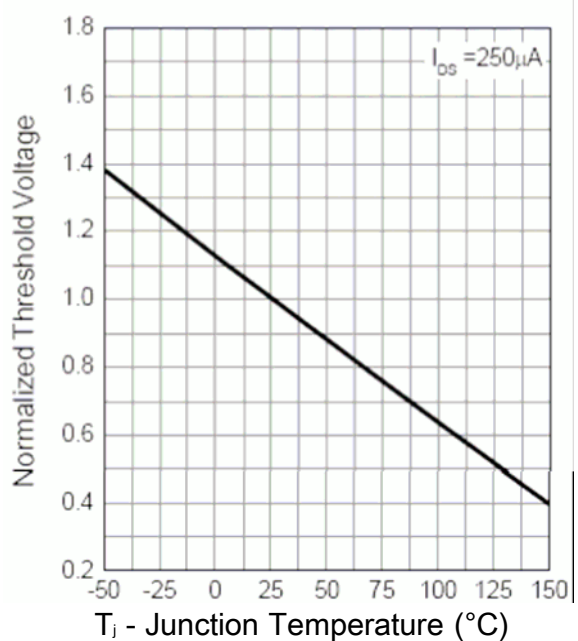
I_D - Drain Current (A)

Transfer Characteristics



V_{GS} - Gate - Source Voltage (V)

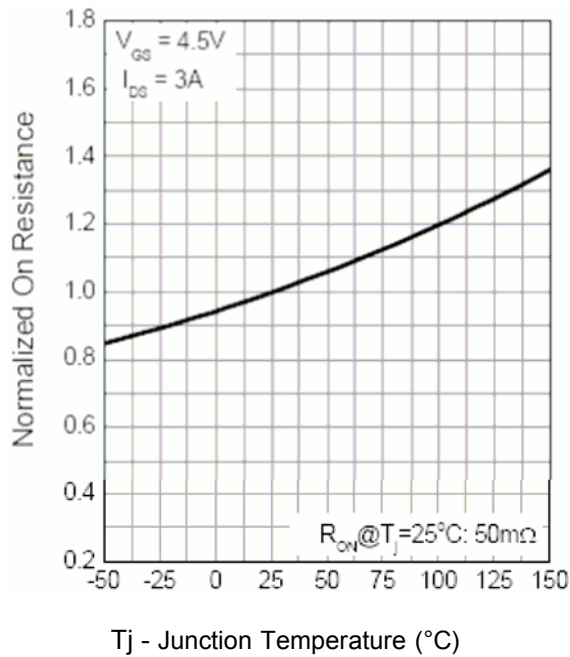
Gate Threshold Voltage



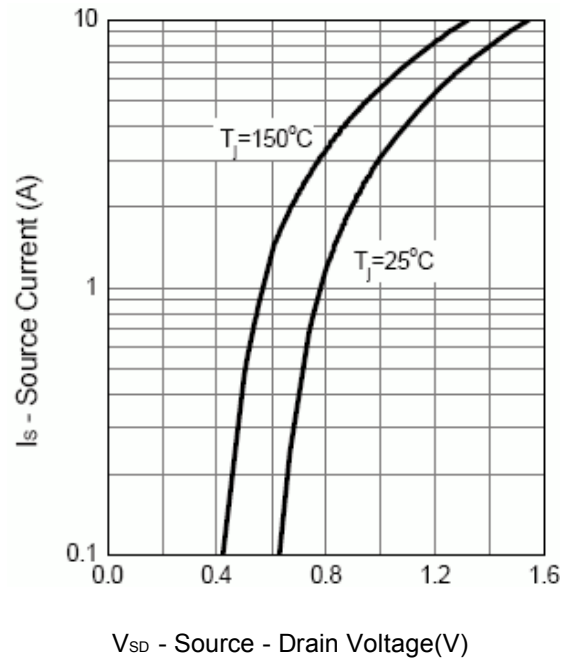
T_J - Junction Temperature ($^\circ C$)

Typical Characteristics (Cont.)

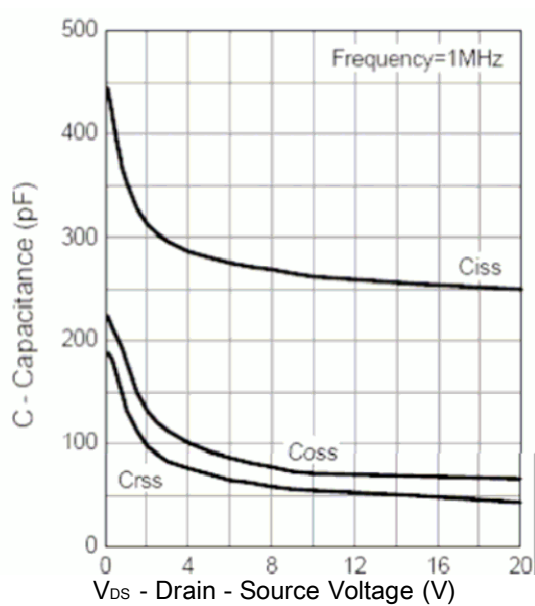
Drain-Source On Resistance



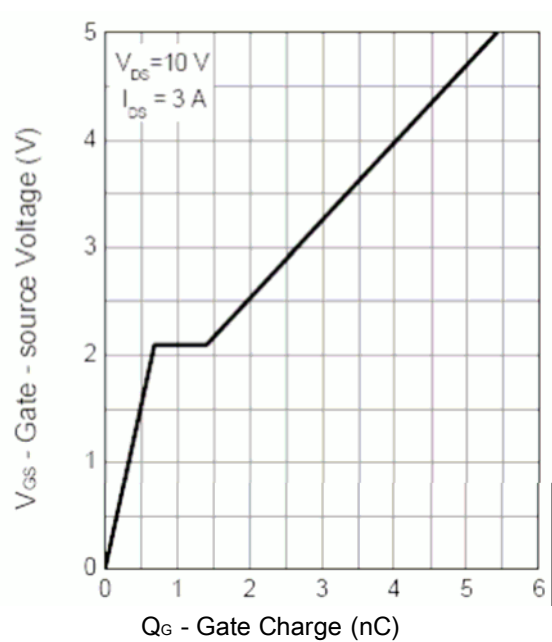
Source-Drain Diode Forward



Capacitance

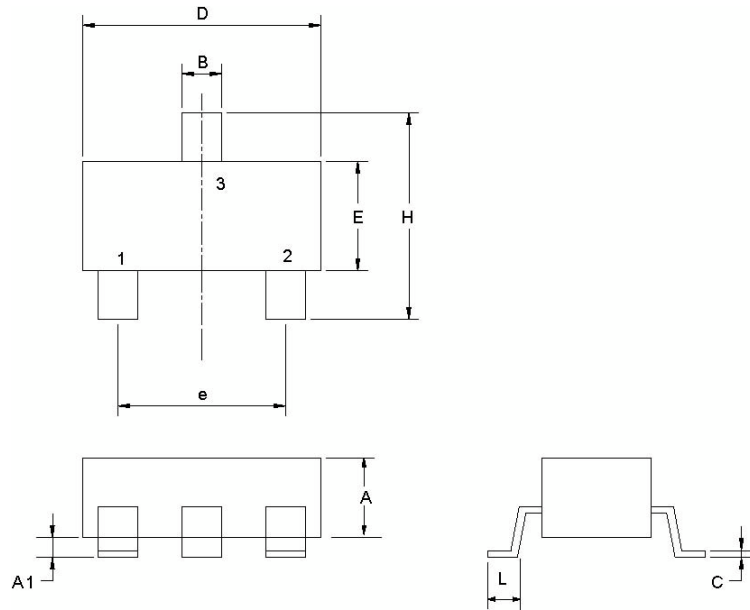


Gate Charge



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	