

SOT-23 Plastic-Encapsulate MOSFETS

TF2300

TF2300 N-Channel 20-V(D-S) MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	0.025Ω@10V	6.0A
	0.032Ω@4.5V	
	0.040Ω@2.5V	

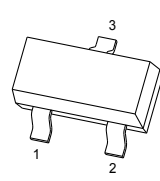
General FEATURE

- TrenchFET Power MOSFET
- Lead free product is acquired
- Surface mount package

APPLICATION

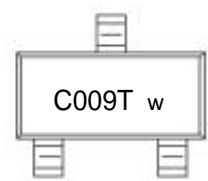
- Load Switch for Portable Devices
- DC/DC Converter

SOT-23



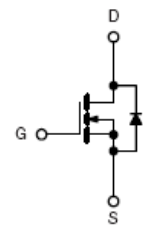
1.GATE
2.SOURCE
3.DRAIN

MARKING



*w: week code

Equivalent Circuit



■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	V_{DS}	20	V	
Gate-Source Voltage	V_{GS}	± 10	V	
Drain-Current	-Continuous * $T_J=125^\circ\text{C}$	I_D	6.0	A
	-Pulsed	I_{DM}	20	A
Power Dissipation *	P_D	1.25	W	
Thermal Resistance,Junction- to-Ambient	R_{thJA}	100	$^\circ\text{C/W}$	
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 to 150	$^\circ\text{C}$	

* Surface Mounted on FR 4 Board , $t \leq 10$ sec.



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■ Electrical Characteristics Ta = 25°C

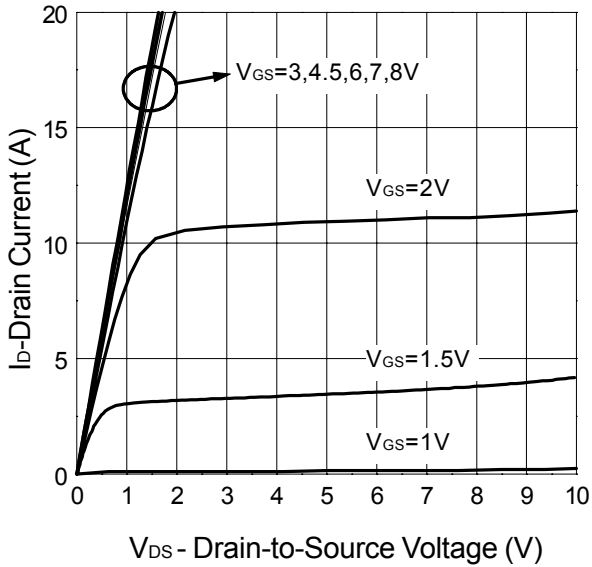
Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V _{DSS}	V _{GS} =0V, I _D =250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =16V, V _{GS} =0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±100	nA
Gate Threshold Voltage *	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250uA	0.5	0.78	1.0	V
Drain- Source on-state Resistance *	R _{DS(on)}	V _{GS} =10.0V, I _D =6.0A		21	25	m Ω
		V _{GS} =4.5V, I _D =3.0A		28	32	m Ω
		V _{GS} =2.5V, I _D =2.0A		35	40	m Ω
On-State Drain Current *	I _{D(on)}	V _{DS} =5V, V _{GS} =4.5V	5			A
Forward Transconductance *	g _{FS}	V _{DS} =15V, I _D =6A	30			S
Input Capacitance	C _{ISS}	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHZ		888		pF
Output Capacitance	C _{OSS}			144		pF
Reverse Transfer Capacitance	C _{RSS}			115		pF
Turn-On Delay Time	t _{D(on)}	V _{DD} =10V, I _D =1A, V _{GS} =4.5V, R _L =10 Ω, R _{GEN} =6 Ω		31.8		ns
Rise Time	t _r			14.5		ns
Turn-Off Delay Time	t _{D(off)}			50.3		ns
Fall Time	t _f			31.9		ns
Total Gate Charge	Q _g	V _{DS} = 10V, I _D = 3.5A, V _{GS} = 4.5V		16.8		nC
Gate-Source Charge	Q _{gs}			2.5		nC
Gate-Drain Charge	Q _{gd}			5.4		nC
Drain-Source Diode Forward Current *	I _S				1.25	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1.25A		0.825	1.3	V

* Pulse Test: Pulse Width ≤ 300 μ, Duty Cycle ≤ 2%

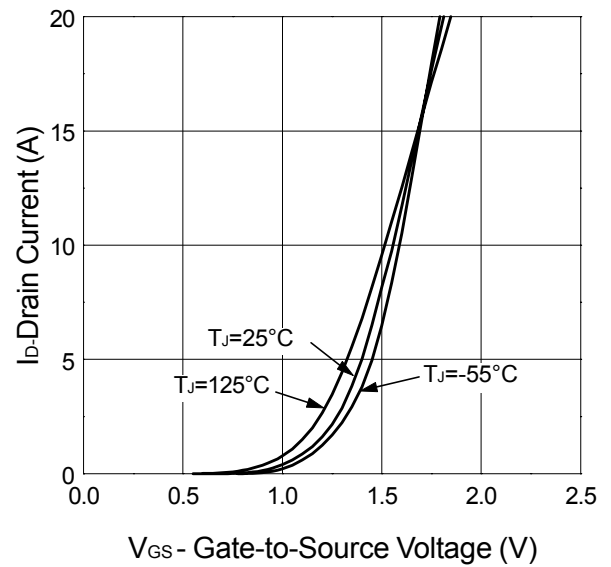


Typical Characteristics

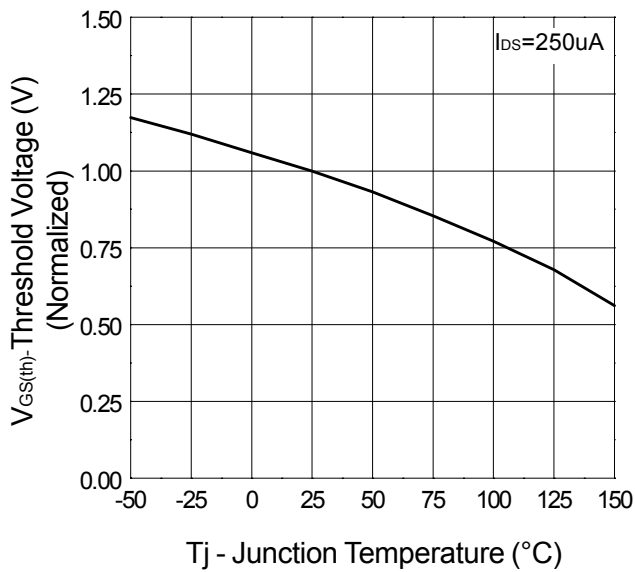
Output Characteristics



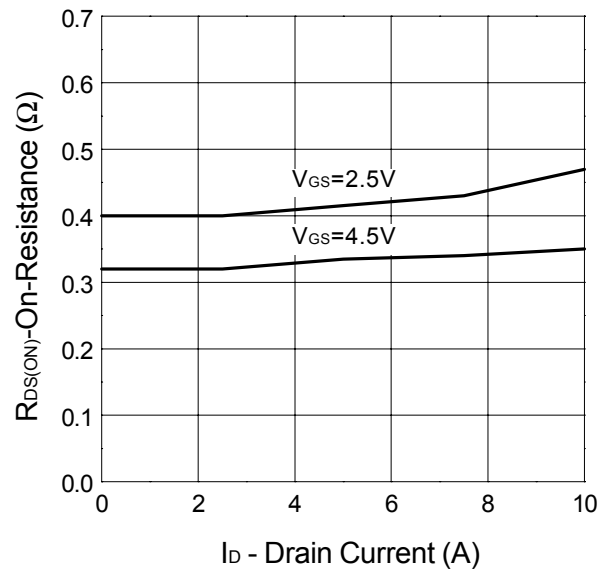
Transfer Characteristics



Threshold Voltage vs. Junction Temperature



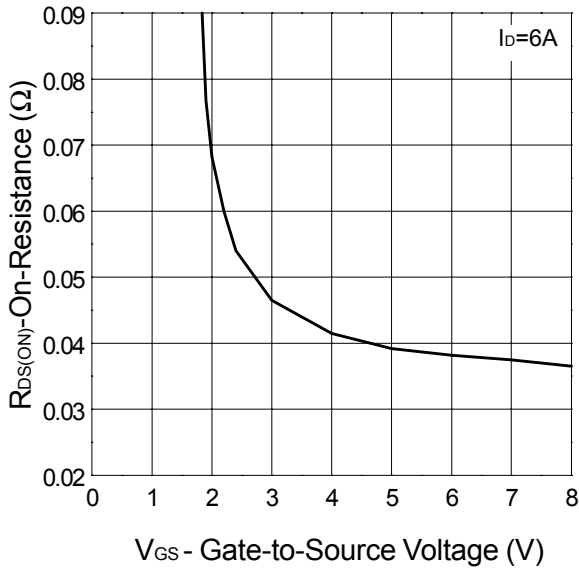
On-Resistance vs. Drain Current



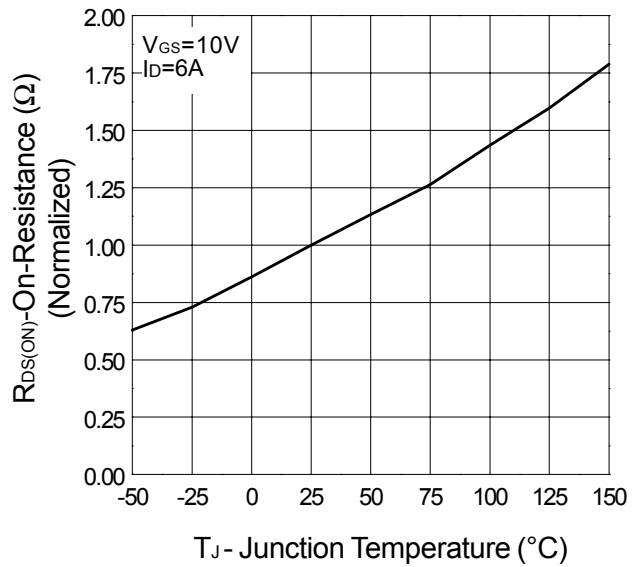


Typical Characteristics (Cont.)

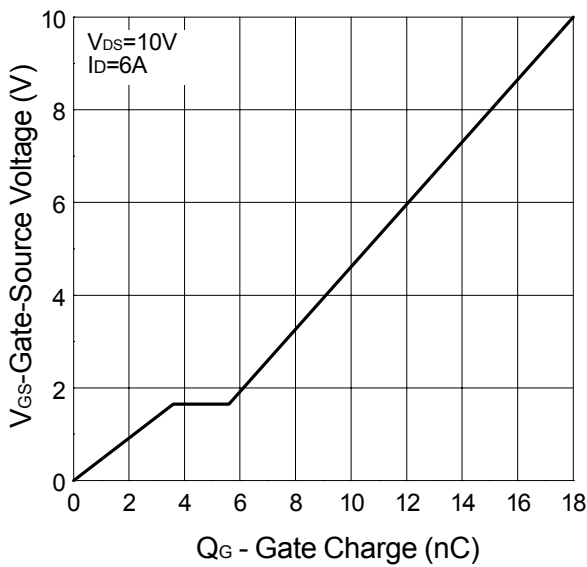
On-Resistance vs. Gate-to-Source Voltage



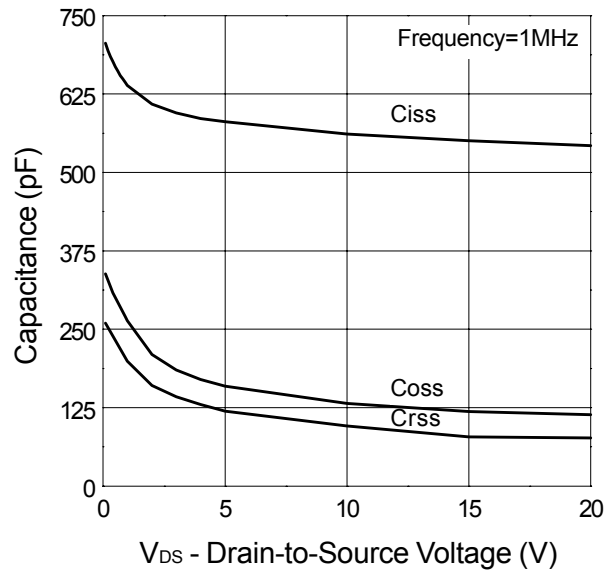
On-Resistance vs. Junction Temperature



Gate Charge

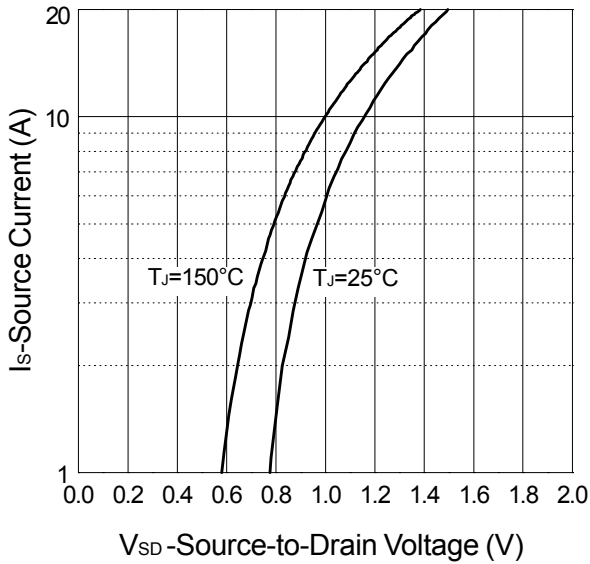


Capacitance

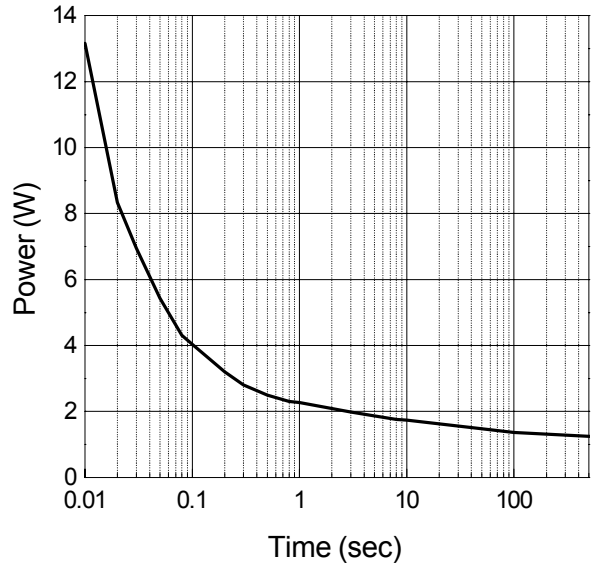


Typical Characteristics (Cont.)

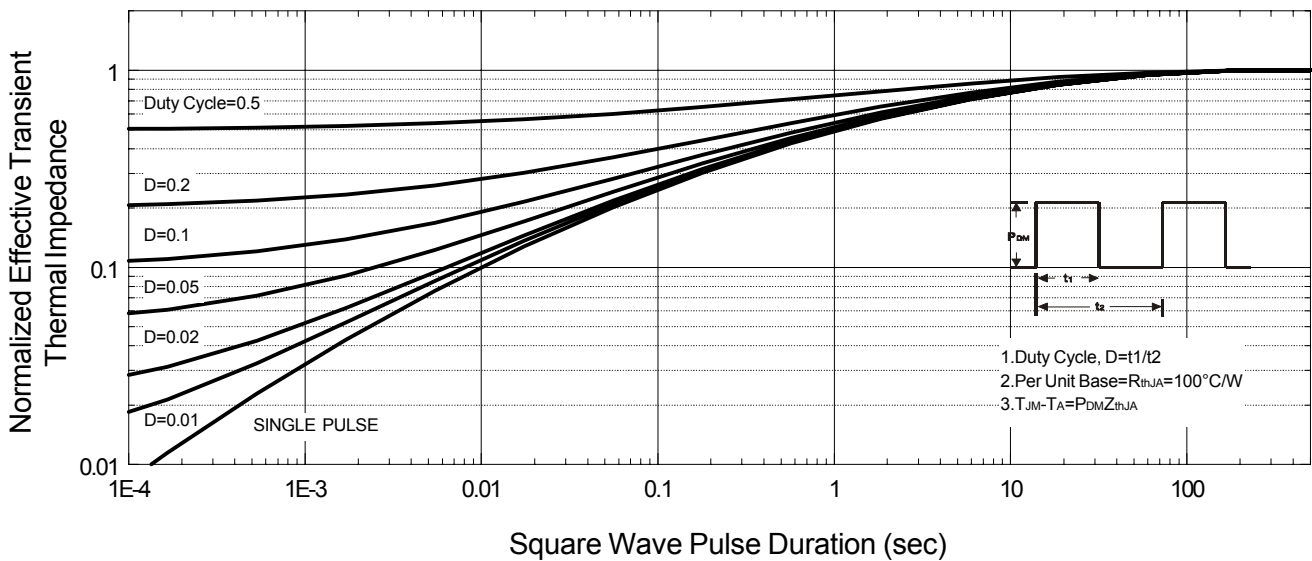
Source-Drain Diode Forward Voltage



Single Pulse Power



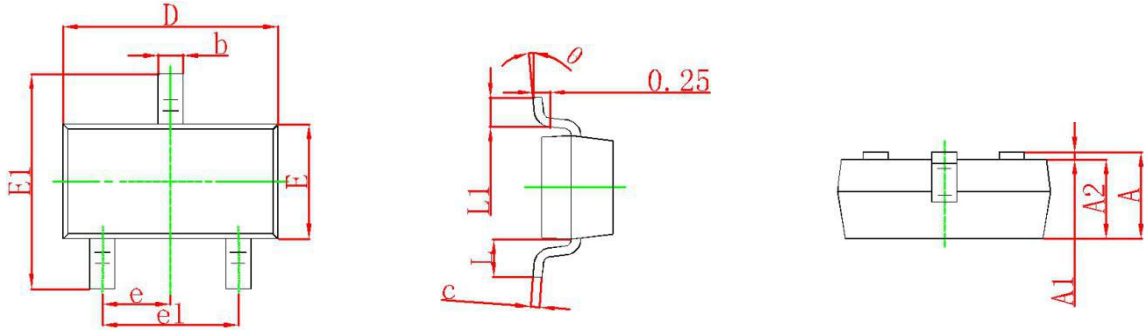
Normalized Thermal Transient Impedence, Junction to Ambient



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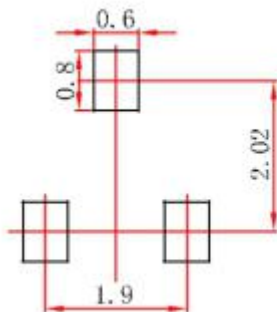
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SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.