

N-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω) Max.	I_D (A)	Q_g (Typ.)
20	0.300 at $V_{GS} = 4.5$ V	0.9	3.5
	0.350 at $V_{GS} = 2.5$ V	0.7	

FEATURES

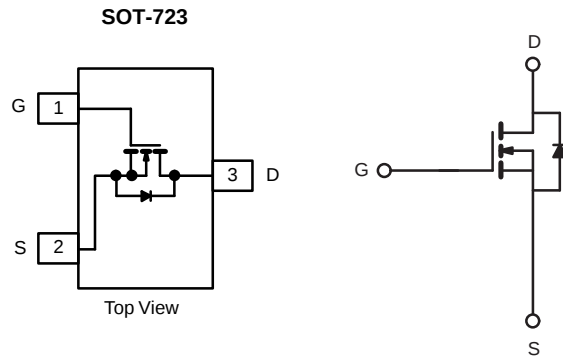
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFET
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Load Switching for Portable Devices
- DC/DC Converter



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Parameter		Symbol	5 s	Steady State	Unit
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	± 12		
Continuous Drain Current ($T_J = 150\text{ }^{\circ}\text{C}$) ^a	$T_A = 25\text{ }^{\circ}\text{C}$	I_D	0.9	0.72	A
	$T_A = 70\text{ }^{\circ}\text{C}$		0.68	0.57	
Pulsed Drain Current ($t = 300\text{ }\mu\text{s}$) ^b		I_{DM}	3.5		
Continuous Source Current (Diode Conduction) ^a		I_S	0.72	0.6	W
Power Dissipation ^a	$T_A = 25\text{ }^{\circ}\text{C}$	P_D	0.35	0.28	
	$T_A = 70\text{ }^{\circ}\text{C}$		0.21	0.16	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150		$^{\circ}\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 5$ s	R_{thJA}	120	145	$^\circ\text{C/W}$
	Steady State		140	175	
Maximum Junction-to-Foot		R_{thJF}	62	78	

Notes:

a. Surface mounted on 1" x 1" FR4 board.

b. Pulse width limited by maximum junction temperature.

SPECIFICATIONS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

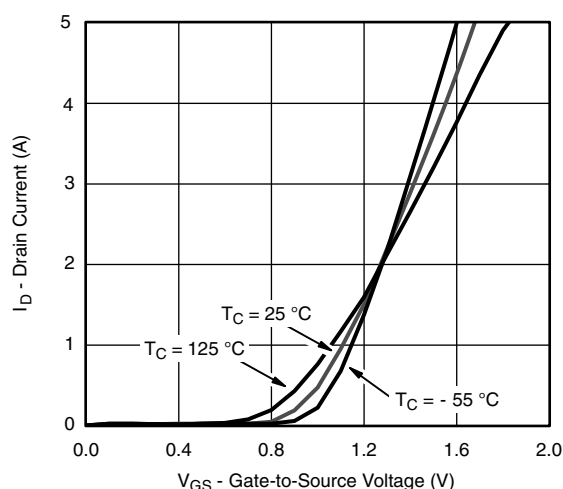
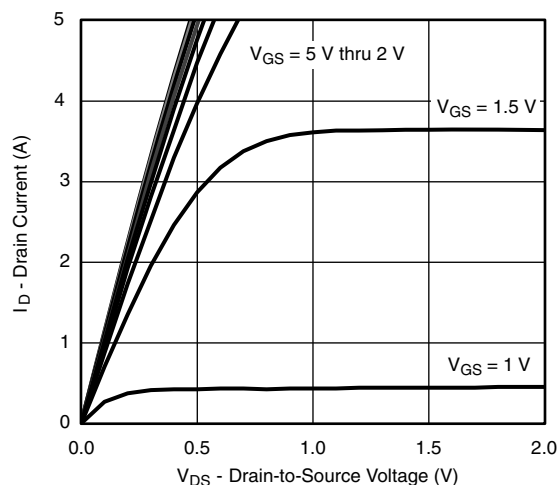
Parameter	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	20			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.50		0.90	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}, T_J = 70\text{ }^{\circ}\text{C}$			75	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 4.5\text{ V}$	6			A
Drain-Source On-Resistance ^a	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 0.9\text{ A}$		0.300		Ω
		$V_{GS} = 2.5\text{ V}, I_D = 0.7\text{ A}$		0.350		
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 0.9\text{ A}$		13		S
Diode Forward Voltage	V_{SD}	$I_S = 0.95\text{ A}, V_{GS} = 0\text{ V}$		0.7	1.2	V
Dynamic ^b						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 0.9\text{ A}$		1.5	1.9	nC
Gate-Source Charge	Q_{gs}			0.25		
Gate-Drain Charge	Q_{gd}			0.40		
Gate Resistance	R_g	$f = 1\text{ MHz}$	2	4	8	Ω
Switching						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}, R_L = 2.78\text{ }\Omega$ $I_D \cong 0.9\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\text{ }\Omega$		8	15	ns
Rise Time	t_r			7	15	
Turn-Off Delay Time	$t_{d(off)}$			30	45	
Fall Time	t_f			7	15	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 0.9\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		8.5	15	nC
Body Diode Reverse Recovery Charge	Q_{rr}			2	4	

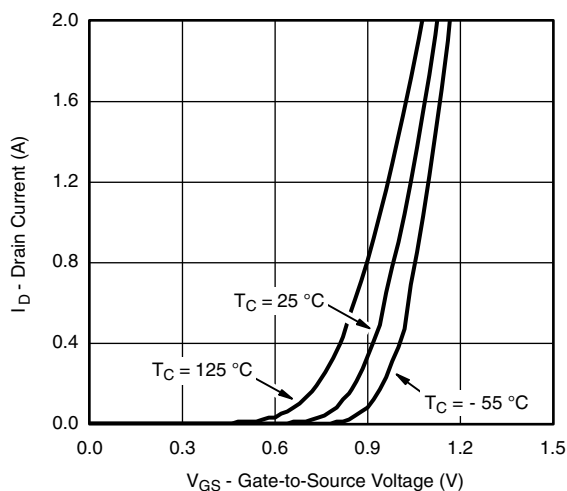
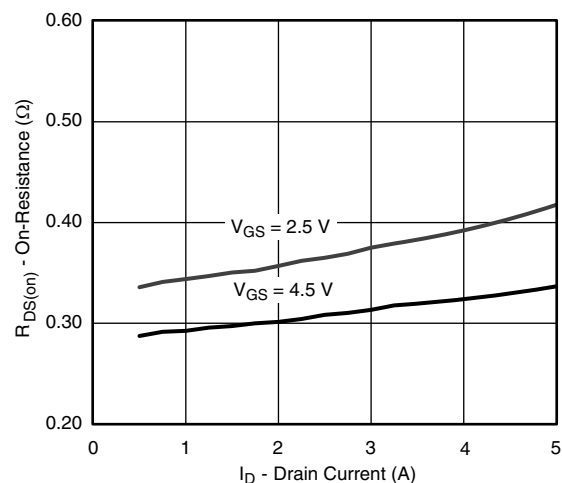
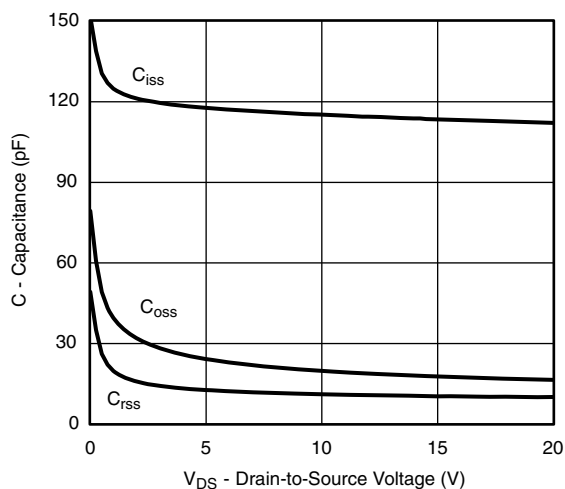
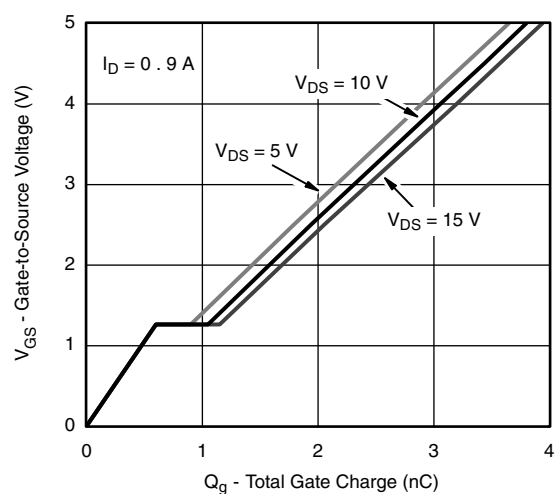
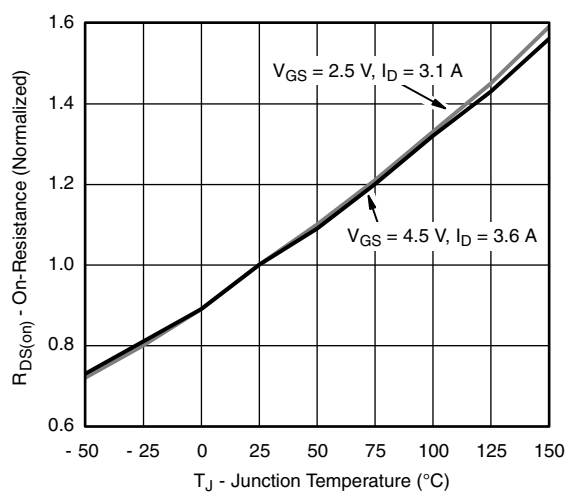
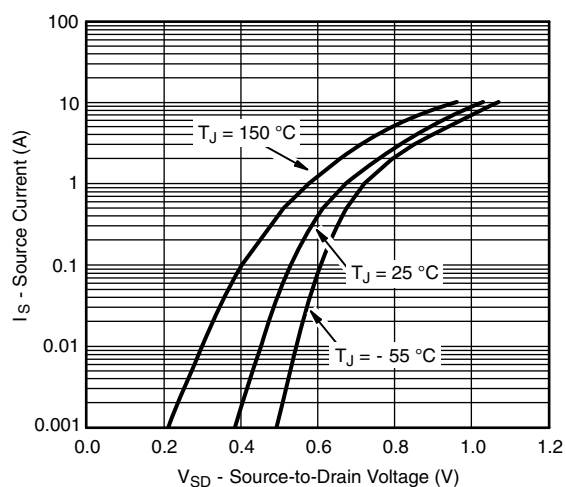
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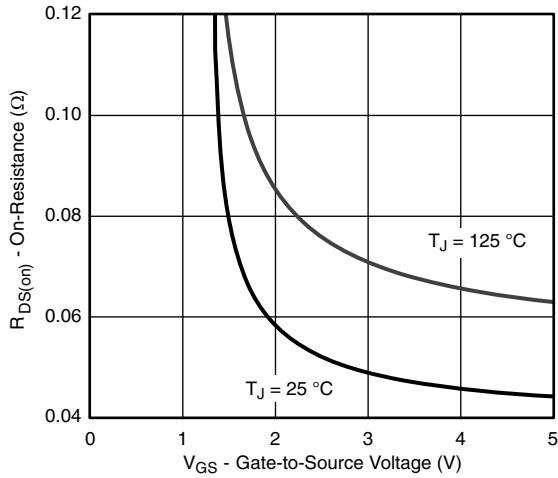
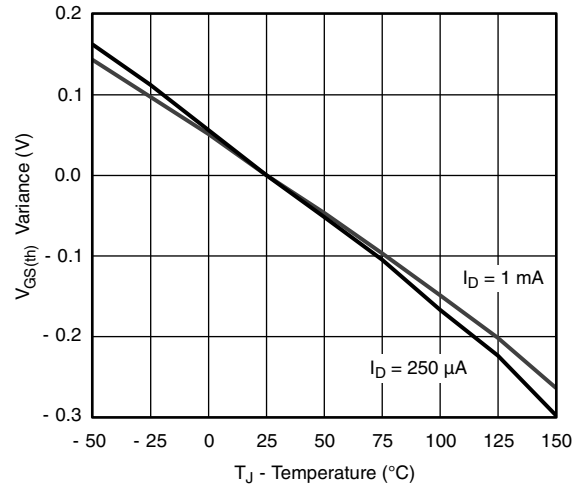
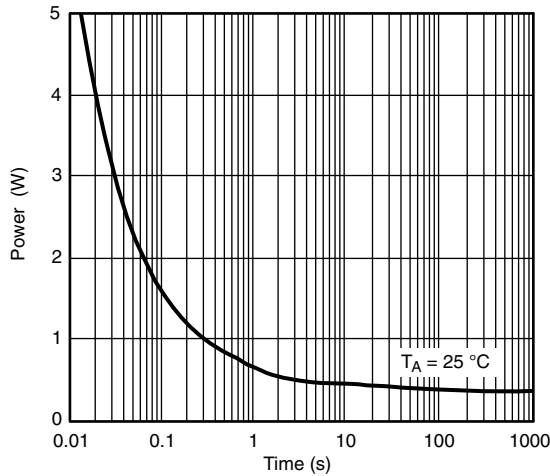
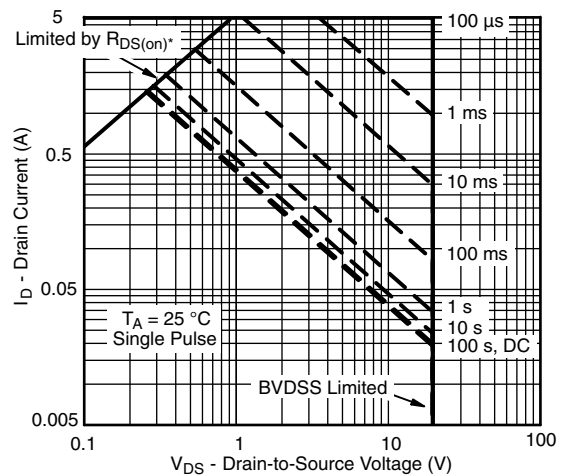
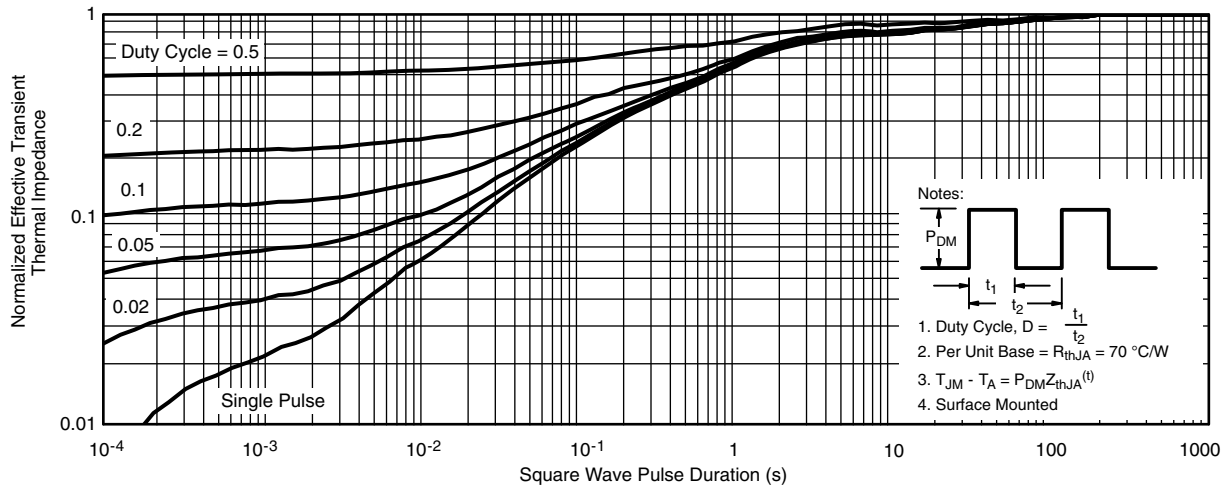
a. Pulse test: Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS ($25\text{ }^{\circ}\text{C}$, unless otherwise noted)

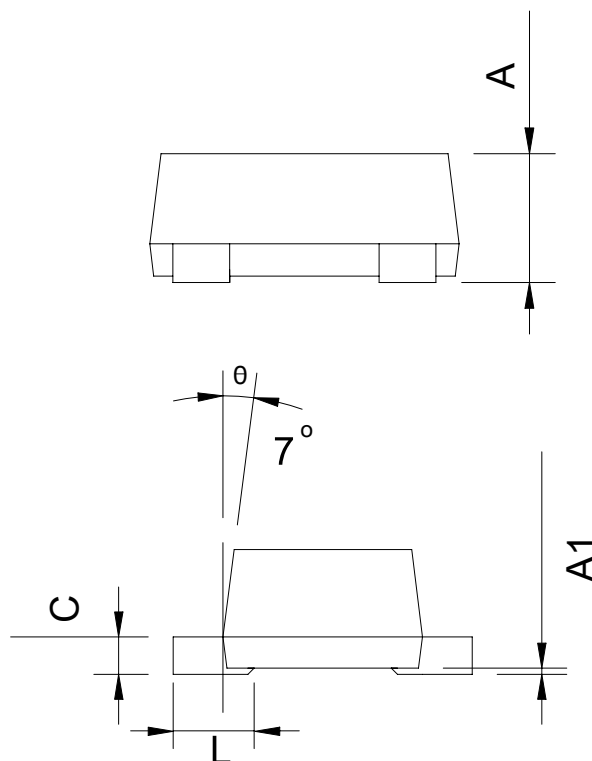
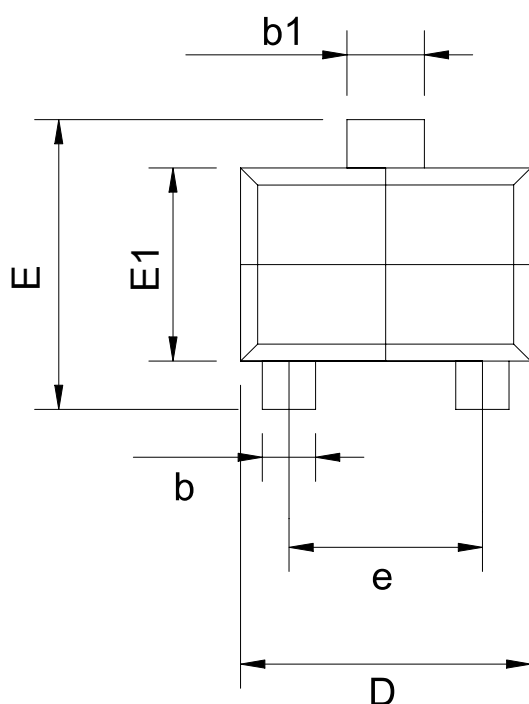
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Transfer Characteristics

On-Resistance vs. Drain Current

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

Source-Drain Diode Forward Voltage

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

On-Resistance vs. Gate-to-Source Voltage

Threshold Voltage

Single Pulse Power

Safe Operating Area, Junction-to-Ambient

Normalized Thermal Transient Impedance, Junction-to-Ambient

Notes:

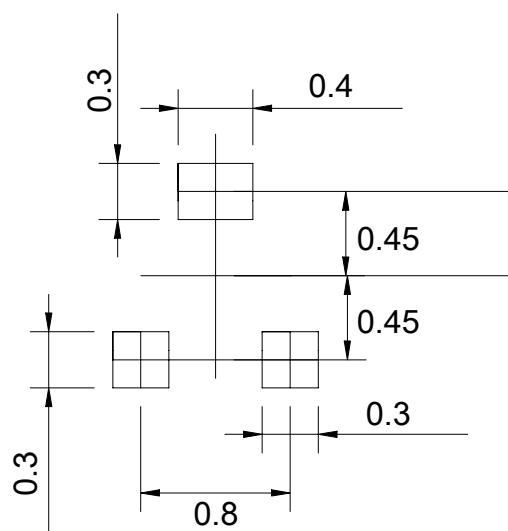
1. Duty Cycle, $D = \frac{t_1}{t_2}$
2. Per Unit Base = $R_{thJA} = 70^\circ\text{C/W}$
3. $T_{JM} - T_A = P_{DM} Z_{thJA}^{(t)}$
4. Surface Mounted

SOT-723: 3 Leads



SYMBOL	SOT-723			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	0.500	-	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	-	0.150	-	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800 TYP.		0.031 TYP.	
L	0.32 BSC		0.013 BSC	
-	° REF.		° REF.	

RECOMMENDED LAND PATTERN



UNIT: mm

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