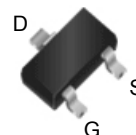


N-Channel 20V,1.2A, N-MOSFET

FEATURES

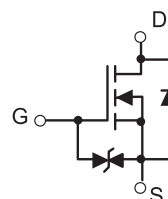
- TrenchFET® Power MOSFET: 1.8-V Rated
- Gate-Source ESD Protected
- High-Side Switching
- Low On-Resistance: $0.4\Omega(\text{max})$
- Low Threshold: $0.7\text{V}(\text{typ})$
- Fast Switching Speed: 10 ns
- S- Prefix for Automotive and Other Applications Requiring



SOT-723

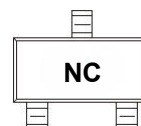
BENEFITS

- Ease in Driving Switches
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- Low Battery Voltage Operation



APPLICATIONS

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Cell Phones, Pagers



ABSOLUTE MAXIMUM RATINGS (T _A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 secs	Steady State	Unit
Drain-Source Voltage		V _{DS}	20		V
Gate-Source Voltage		V _{GS}	± 8		
Continuous Drain Current (T _J = 150°C) ^b	T _A = 25°C	I _D	1200	900	mA
	T _A = 85°C		800	600	
Pulsed Drain Current ^a		I _{DM}	2500		
Continuous Source Current (diode conduction) ^b		I _S	275	250	
Maximum Power Dissipation ^b for SC-89	T _A = 25°C	P _D	275	250	mW
	T _A = 85°C		160	140	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°C

Notes

- d. Pulse width limited by maximum junction temperature.
e. Surface Mounted on FR4 Board.

● **Electrical Characteristics (@TA=25°C unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V$	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.5	--	1.0	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	--	--	± 10	μA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=0.5A$	--	250	400	m Ω
		$V_{GS}=2.5V, I_D=0.5A$	--	300	500	m Ω
		$V_{GS}=1.8V, I_D=0.35A$	--	400	650	m Ω
Total Gate Charge	Q_g	$V_{GS}=4.5V, V_{DS}=10V, I_D=1A$	--	2	--	nC
Gate- Source Charge	Q_{gs}		--	0.3	--	nC
Gate- Drain Charge	Q_{gd}		--	0.3	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=4.5V, V_{DS}=10V, R_{GEN}=6\Omega, I_D=2A$	--	1.2	--	ns
Turn-on Rise Time	t_r		--	25	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	14	--	ns
Turn-off Fall Time	t_f		--	15	--	ns
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=10V, f=1MHz$	--	43	--	pF
Output Capacitance	C_{oss}		--	9	--	pF
Reverse Transfer Capacitance	C_{rss}		--	6	--	pF

● **Reverse Diode Characteristics (@TA=25°C unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Diode Forward Current	I_{SD}	$V_G=V_D=0V$, Force Current	--	--	3.5	A
Diode Forward Voltage	V_{SD}	$I_{SD}=0.5A, V_{GS}=0V$	--	--	1.3	V
Reverse Recovery Time	t_{rr}	$I_F = 1A$ $di/dt = 100 A/\mu s$	--	9	--	nS
Reverse Recovery Charge	Q_{rr}		--	1	--	nC

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with TA=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t<10s junction to ambient thermal resistance rating.

● **TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

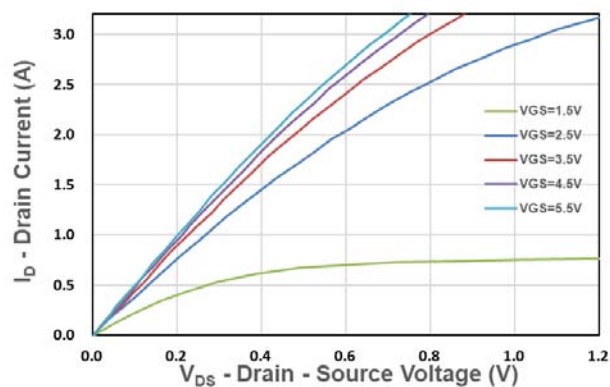


Figure 1. Output Characteristics

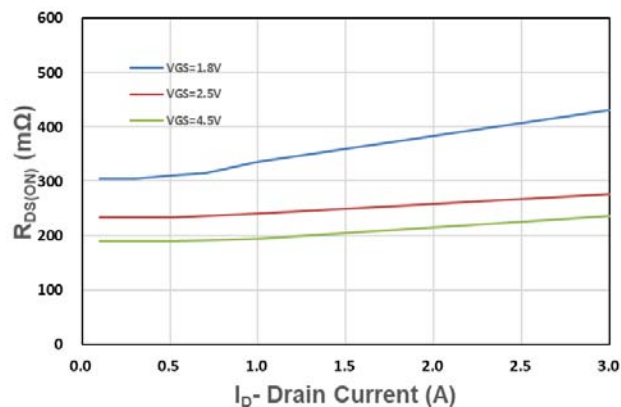


Figure 2. On-Resistance vs. I

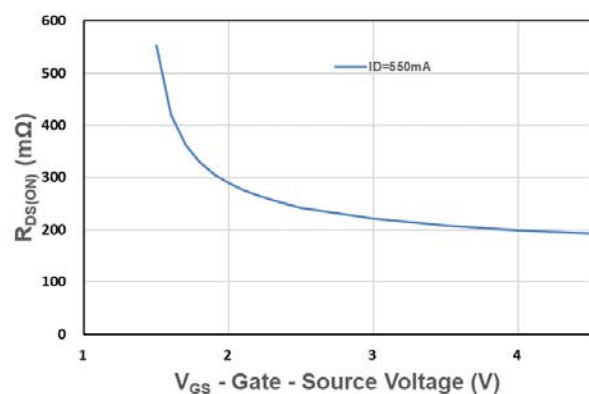


Figure 3. On-Resistance vs. V_{GS}

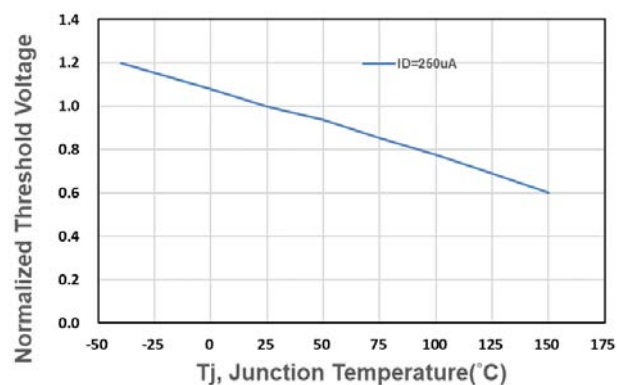


Figure 4. Gate Threshold Voltage

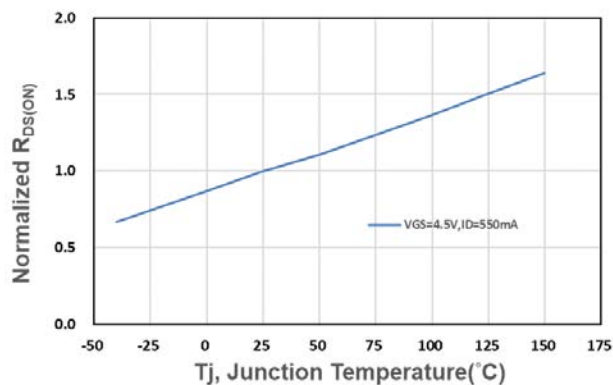


Figure 5. Drain-Source On Resistance

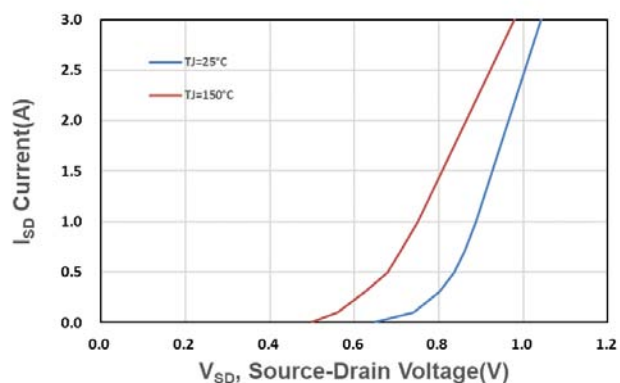


Figure 6. Source-Drain Diode Forward

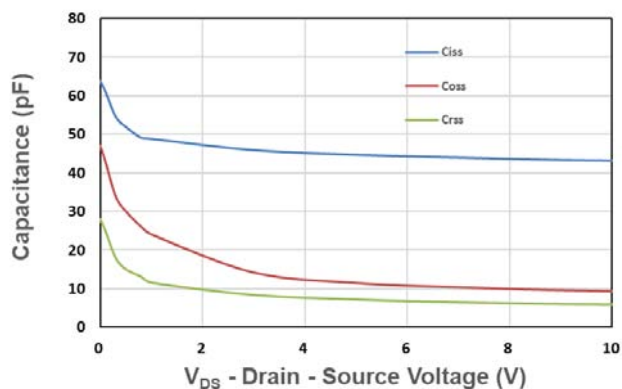


Figure 7. Capacitance

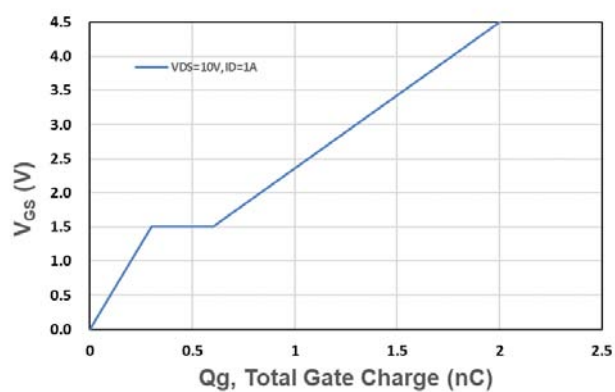


Figure 8. Gate Charge Characteristics

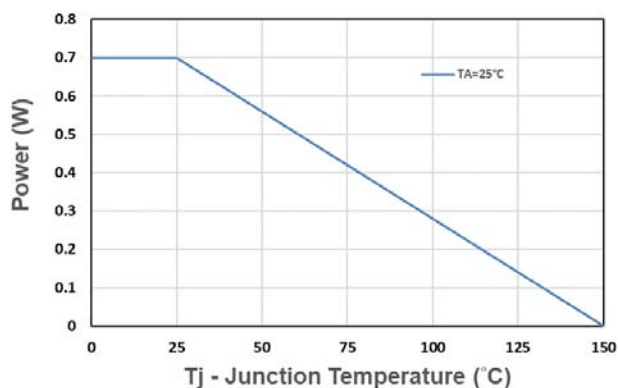


Figure 9. Power Dissipation

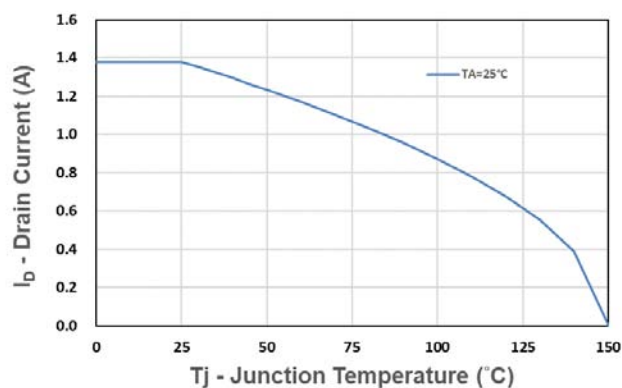


Figure 10. Drain Current

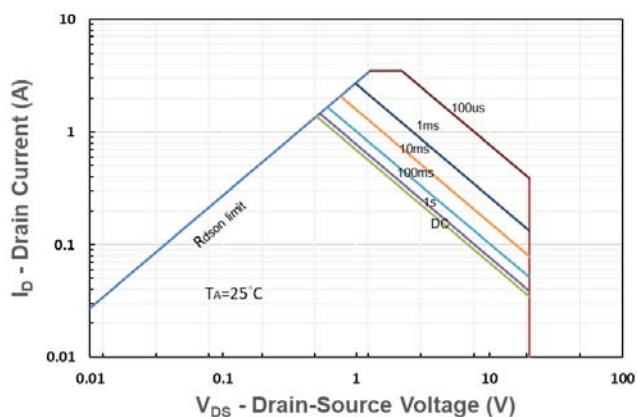


Figure 11. Safe Operating Area

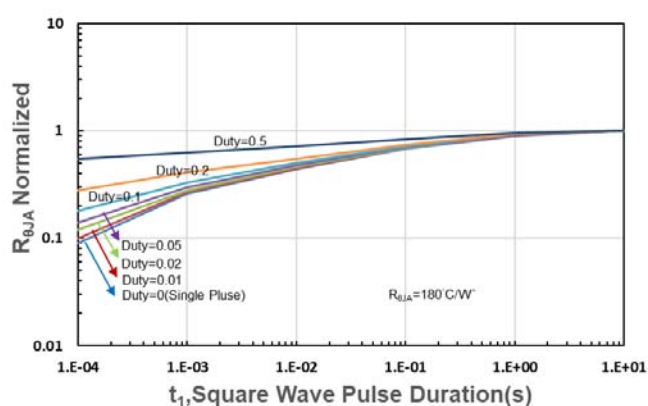
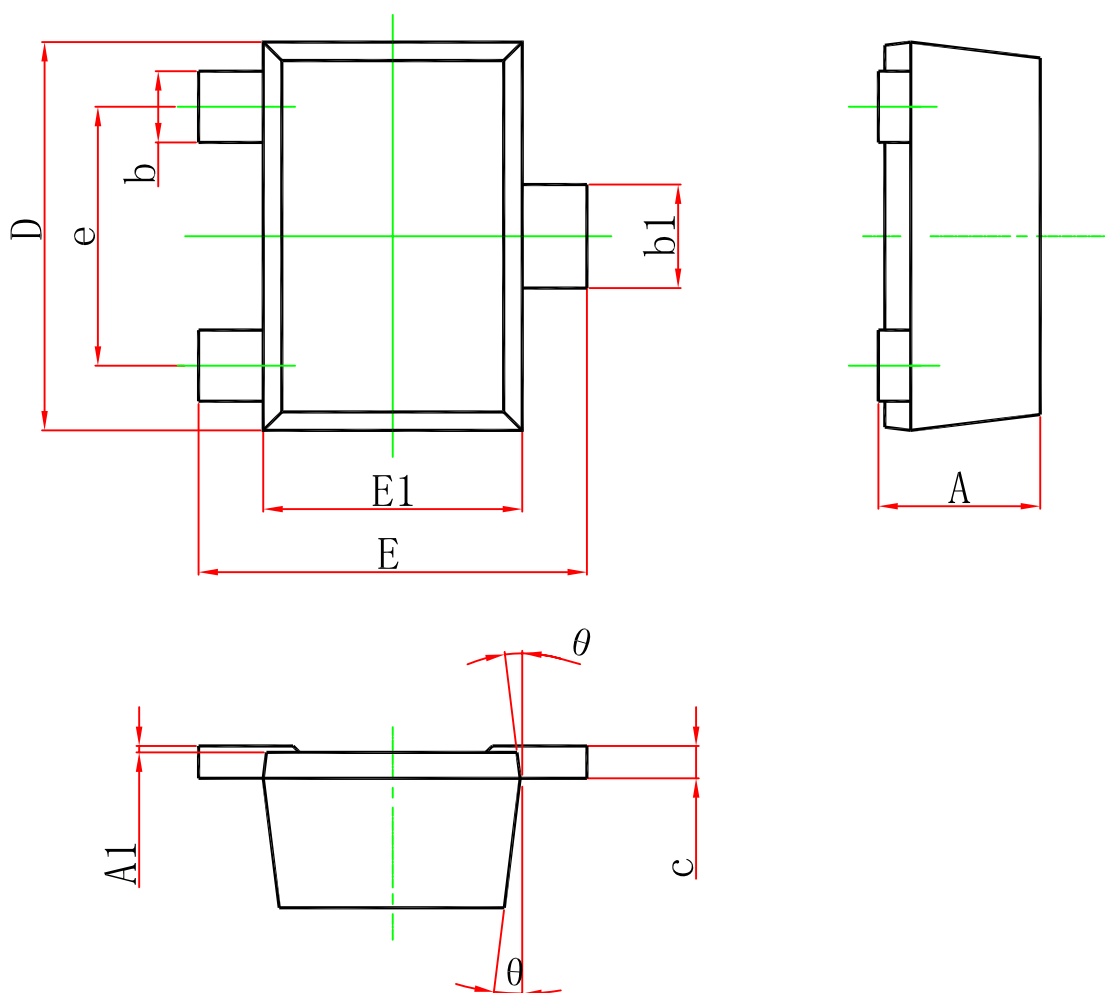


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

SOT-723 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.500	0.017	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	0.080	0.150	0.003	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	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	