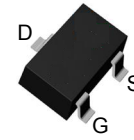


- 20V/3.8A
- $R_{DS(ON)}=33m\Omega$ (typ) @VGS=4.5V
 $R_{DS(ON)}=45m\Omega$ (typ) @VGS=2.5V
- 100% UIS & RG Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

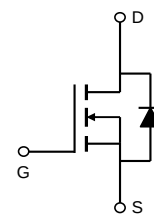
Applications

- Power Management for Industrial DC/DC Converters

Pin Description



Top View of SOT-23



N-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		20	V
V _{GSS}	Gate-Source Voltage		±12	
ID	Continuous Drain Current	T _A =25°C	3.8	A
		T _A =70°C	3.3	
I _{DM}	Pulsed Drain Current ^C		18	
I _S	Diode Continuous Forward Current	T _c =25°C	-3.8	A
T _{STG} , T _J	Storage Temperature Range		-55 to 150	°C
PD	Power Dissipation ^B	T _A =25°C	1.25	W
		T _A =70°C	0.8	
R _{θJL}	Thermal Resistance-Junction to Lead		80	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient ^{A D}	t≤10S	90	°C/W
		Steady-State	125	

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V	20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =20V, V _{GS} =0V T _J =55°C			1 5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±12V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.5	0.8	1.1	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =3.8A T _J =125°C		33 45	45 53.6	mΩ
		V _{GS} =2.5V, I _D =3A		45	58	mΩ
		V _{GS} =1.8V, I _D =3A		60	75	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =6.5A		50		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.6	1	V
I _S	Maximum Body-Diode Continuous Current				2	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, f=1MHz		660		pF
C _{oss}	Output Capacitance			100		pF
C _{rss}	Reverse Transfer Capacitance			80		pF
R _g	Gate resistance	f=1MHz	2	4	6	Ω
SWITCHING PARAMETERS						
Q _g (4.5V)	Total Gate Charge	V _{GS} =4.5V, V _{DS} =10V, I _D =6.5A		7	14	nC
Q _{gs}	Gate Source Charge			1		nC
Q _{gd}	Gate Drain Charge			2		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =4.5V, V _{DS} =10V, R _L =1.54Ω, R _{GEN} =3Ω		7		ns
t _r	Turn-On Rise Time			10		ns
t _{D(off)}	Turn-Off DelayTime			32		ns
t _f	Turn-Off Fall Time			11		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =6.5A, di/dt=500A/μs		8		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =6.5A, di/dt=500A/μs		6		nC

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

B. The power dissipation P_D is based on T_{J(MAX)}=150° C, using ≤ 10s junction-to-ambient thermal resistance.

C. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150° C. Ratings are based on low frequency and duty cycles to keep initial T_J=25° C.

D. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-ambient thermal impedance which is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T_{J(MAX)}=150° C. The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

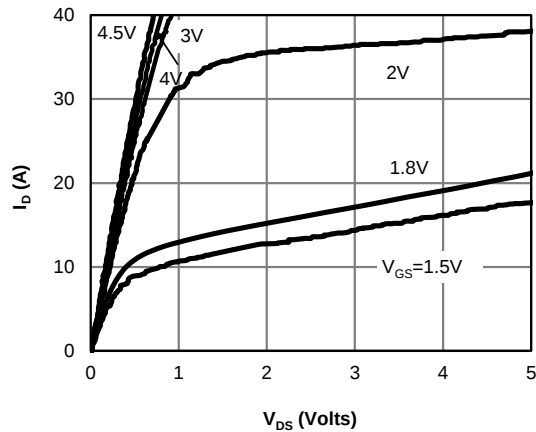


Figure 1: On-Region Characteristics (Note E)

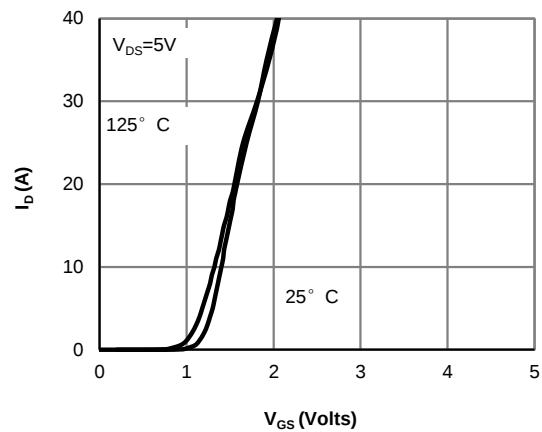


Figure 2: Transfer Characteristics (Note E)

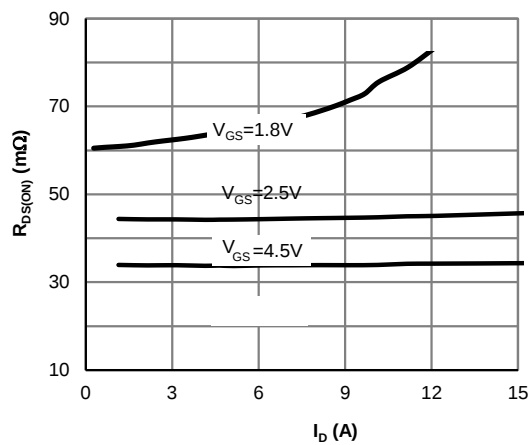


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

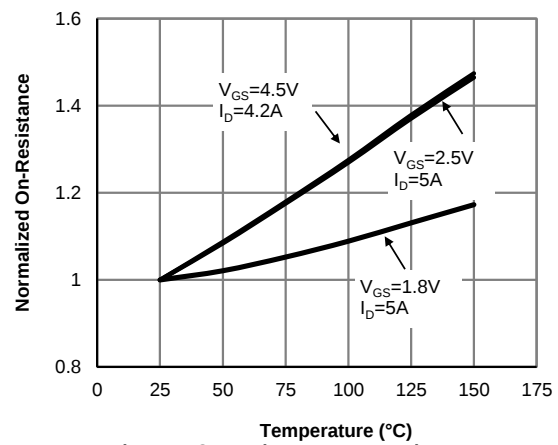
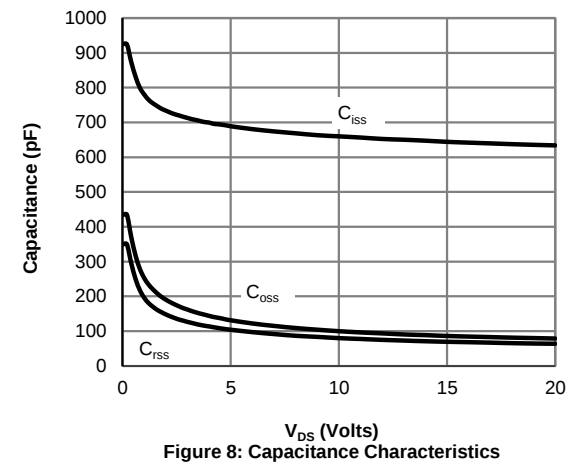
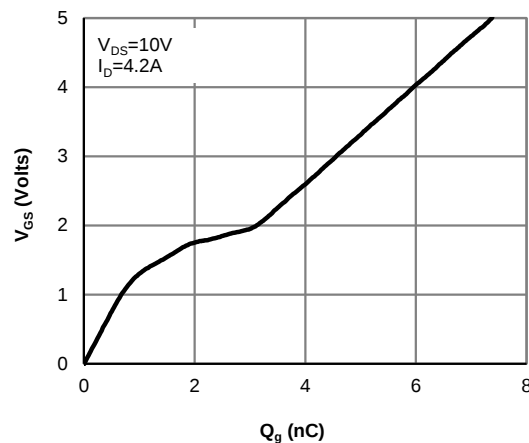
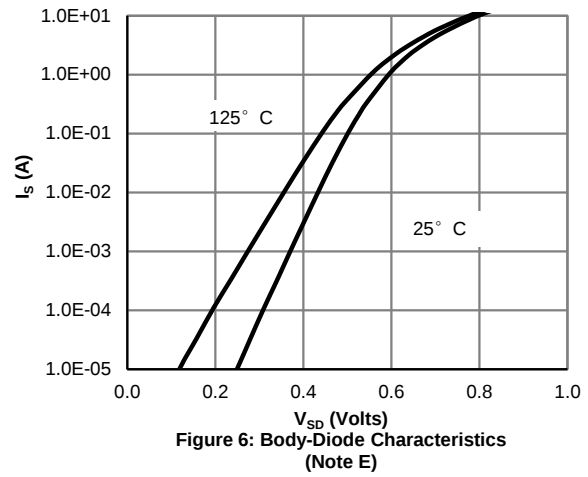
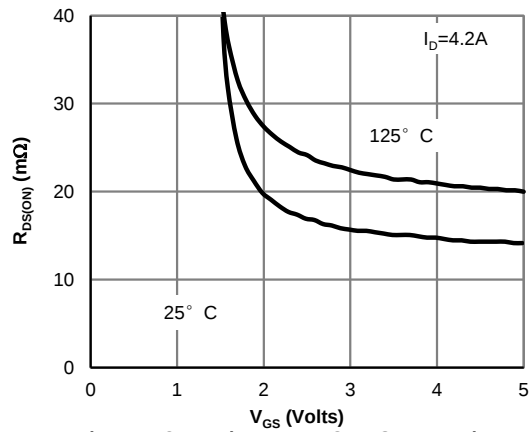


Figure 4: On-Resistance vs. Junction Temperature (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

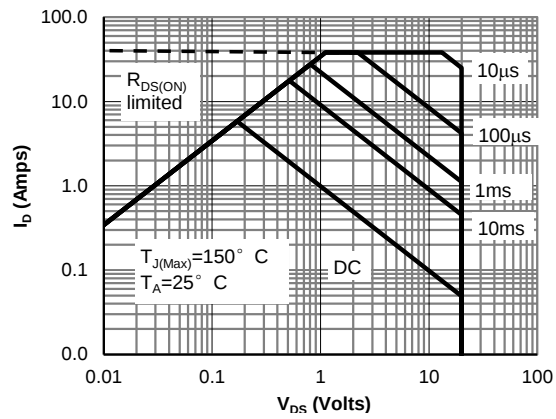


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

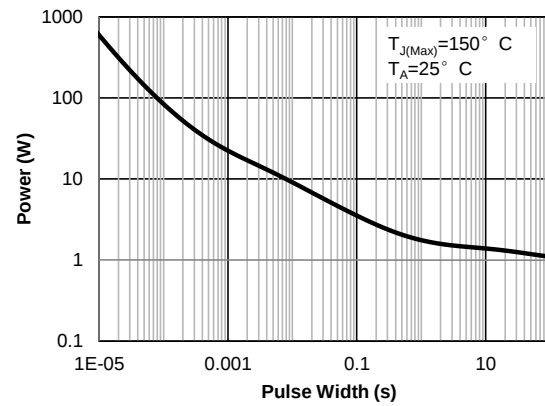


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

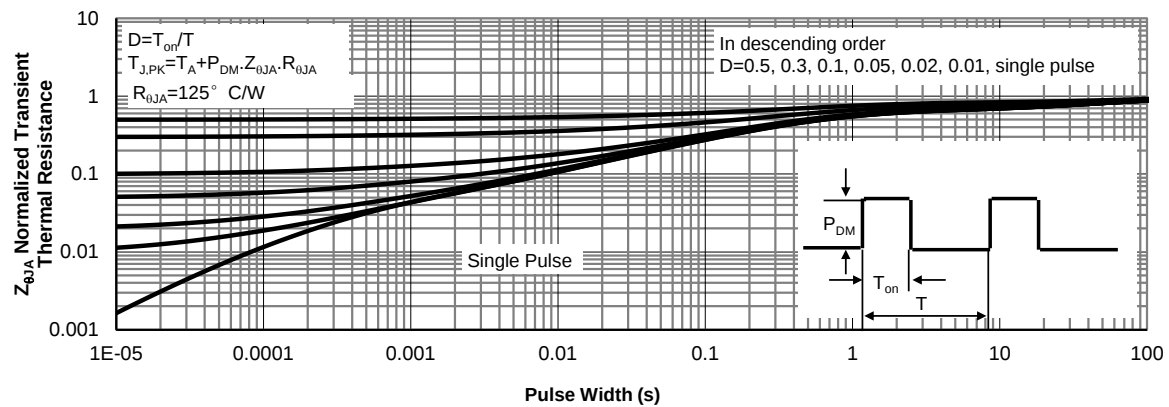
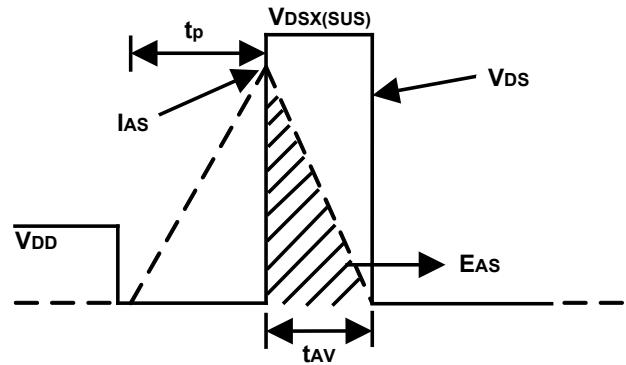
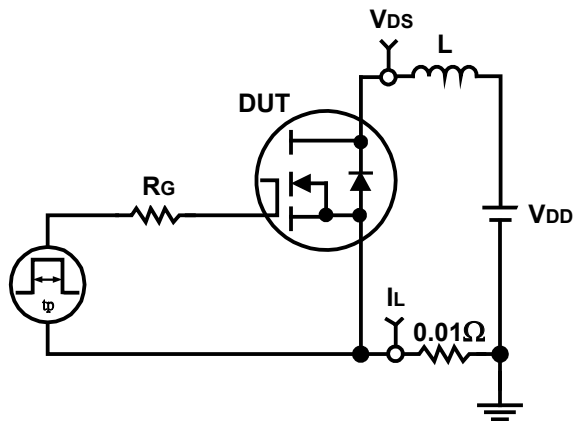
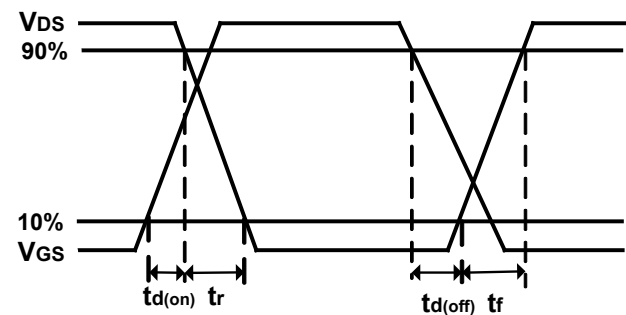
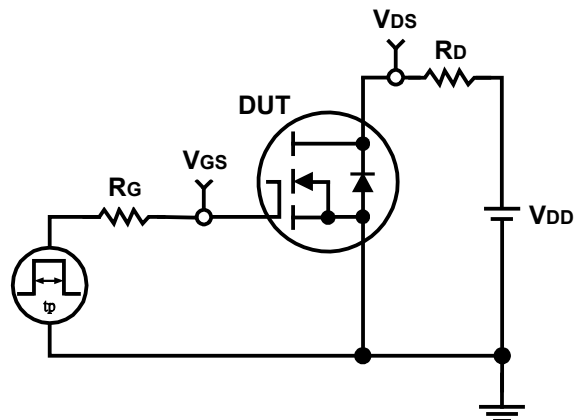


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Avalanche Test Circuit and Waveforms

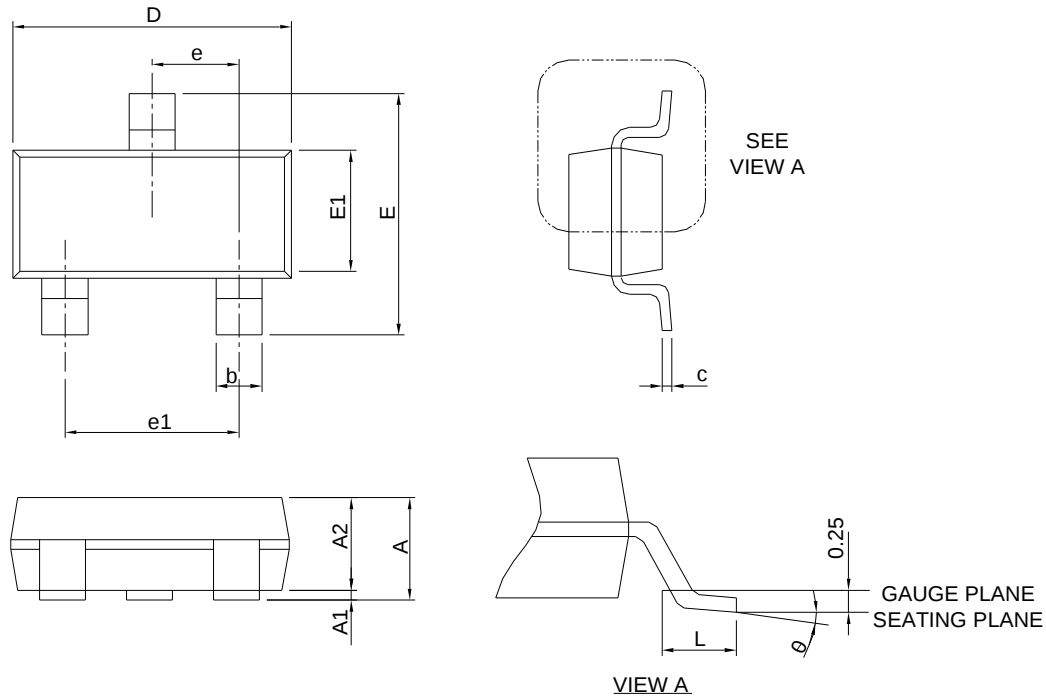


Switching Time Test Circuit and Waveforms



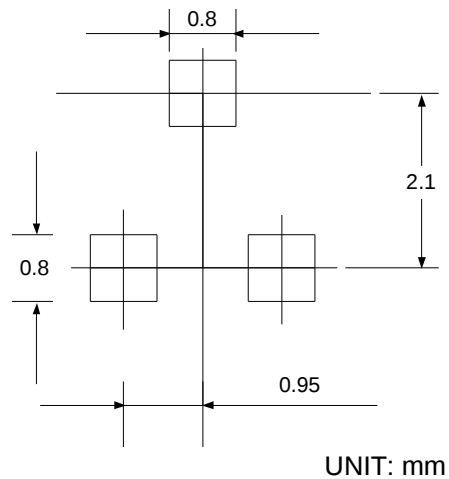
Package Information

SOT-23



SYMBOL	SOT-23			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.20	-	0.047
A1	0.00	0.10	0.000	0.004
A2	0.90	1.10	0.035	0.043
b	0.30	0.50	0.012	0.020
c	0.08	0.22	0.003	0.009
D	2.70	3.10	0.106	0.122
E	2.20	2.60	0.086	0.102
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0 °	8 °	0 °	8 °

RECOMMENDED LAND PATTERN



Note : Dimension D and E1 do not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side.