

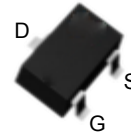
Features

- 60V/6A,
 $R_{DS(ON)} = 25m\Omega(\text{typ.}) @ V_{GS}=10V$
 $R_{DS(ON)} = 30m\Omega(\text{typ.}) @ V_{GS}=4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

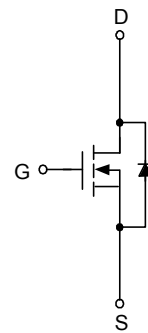
Applications

- High frequency DC-DC converters.

Pin Description



Top View of SOT-23-3



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		60	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current	T _A =25°C	6	A
I _D	Continuous Drain Current	T _A =25°C	6	A
		T _A =70°C	2.4	
I _{DM} ^a	Pulsed Drain Current	T _A =25°C	18	A
P _D	Maximum Power Dissipation	T _A =25°C	2.5	W
		T _A =70°C	1.6	
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	t ≤ 10s	50	°C/W
		Steady State	90	°C/W
I _{AS} ^c	Avalanche Current, Single pulse	L=0.5mH	8	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.5mH	16	mJ

Note a : Pulse width limited by max. junction temperature.

Note b : Surface mounted on 1in^2 pad area

Note c : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$)

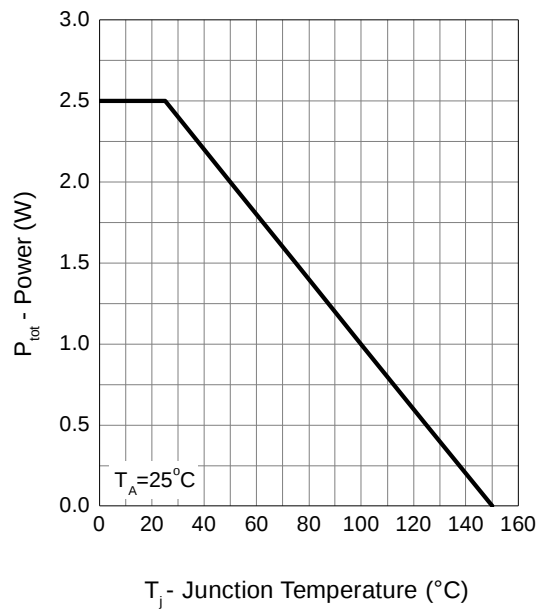
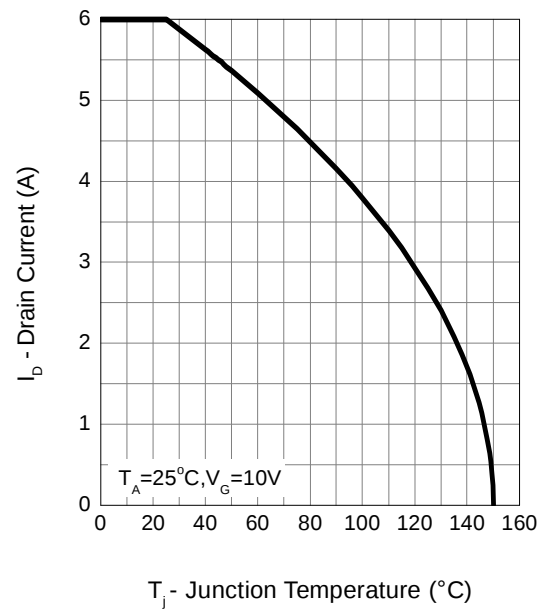
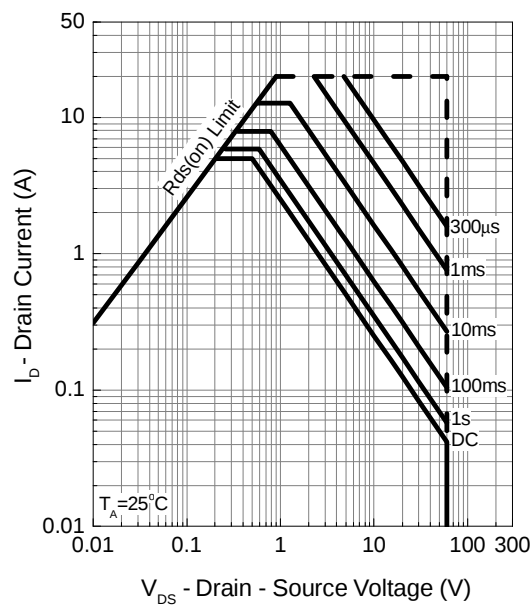
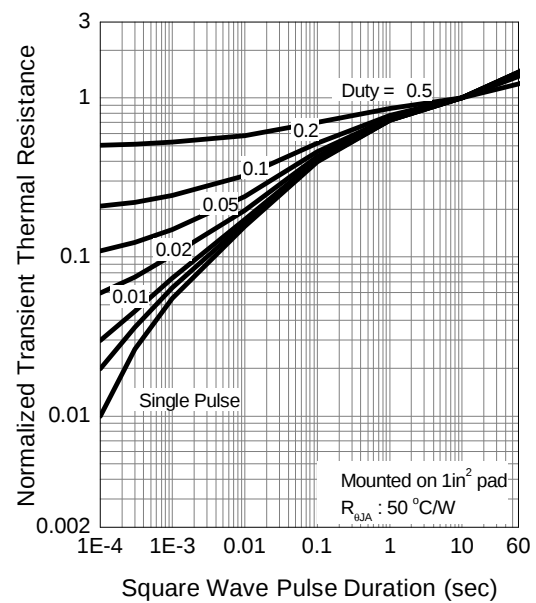
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1	2	3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =4A	-	25	35	mΩ
		V _{GS} =4.5V, I _{DS} =3A	-	30	45	mΩ
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =3A, V _{GS} =0V	-	0.8	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =3A, dI _{SD} /dt=100A/μs	-	20	-	ns
Q _{rr}	Reverse Recovery Charge		-	20	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	2.8	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Frequency=1.0MHz	-	940	1100	pF
C _{oss}	Output Capacitance		-	66	-	
C _{rss}	Reverse Transfer Capacitance		-	56	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _L =30Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	10	18	ns
t _r	Turn-on Rise Time		-	6	11	
t _{d(OFF)}	Turn-off Delay Time		-	21	38	
t _f	Turn-off Fall Time		-	5	9	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =4.5V, I _{DS} =5A	-	5.5	-	nC
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =10V, I _{DS} =5A	-	11.5	16	
Q _{gs}	Gate-Source Charge		-	2.3	-	
Q _{gd}	Gate-Drain Charge		-	2.2	-	

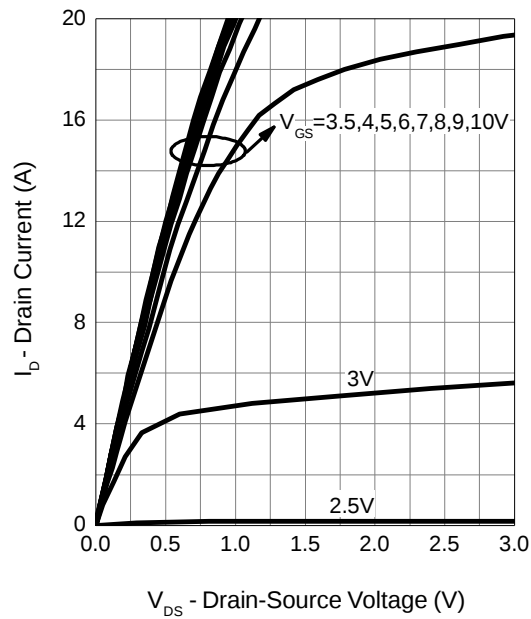
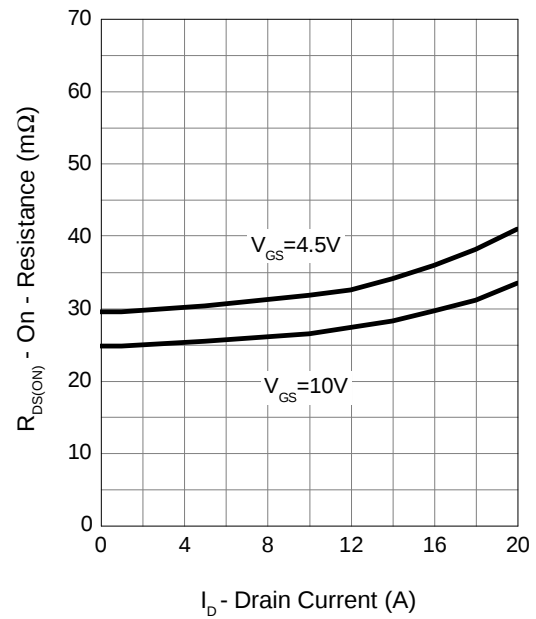
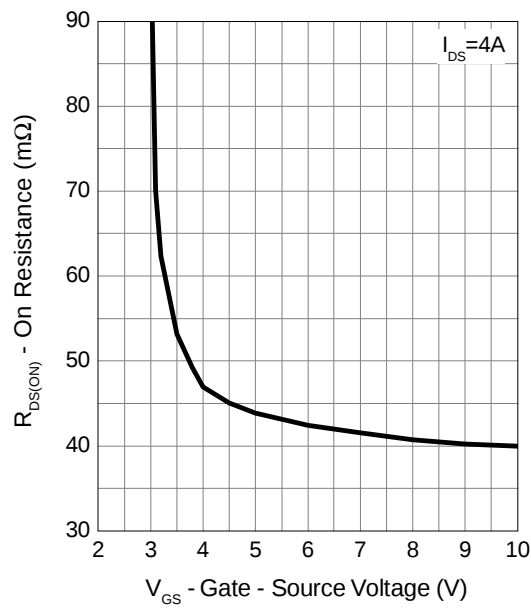
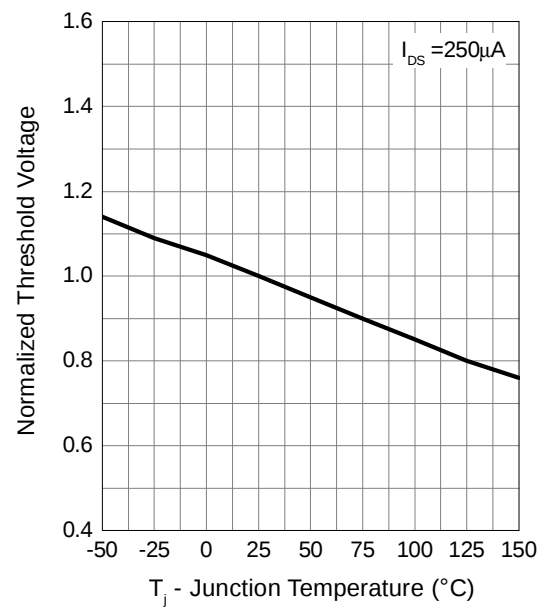
Note d : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Note e : Guaranteed by design, not subject to production testing.

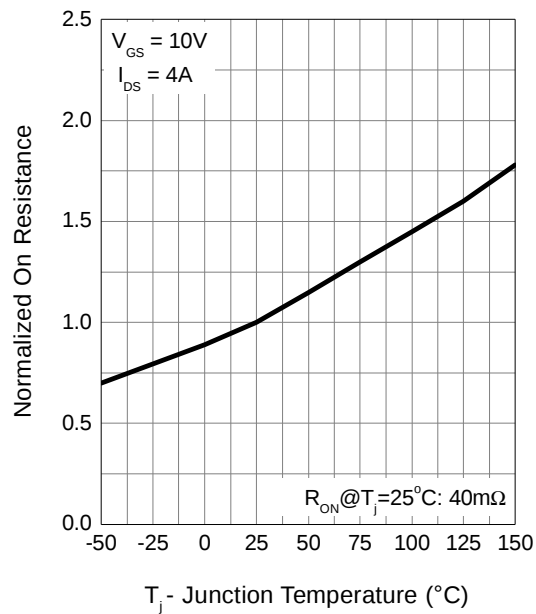
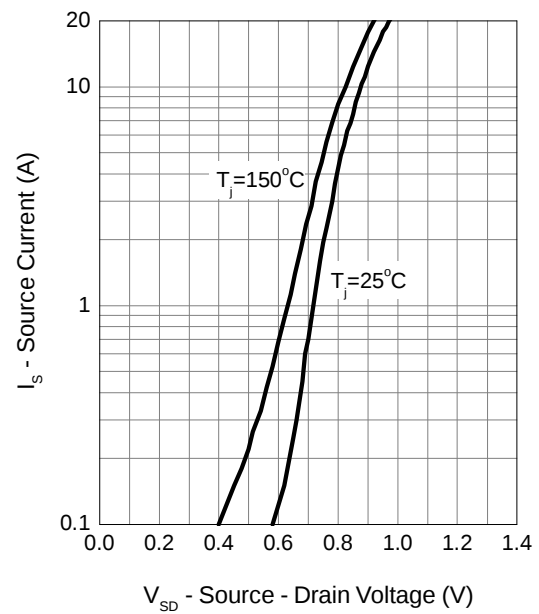
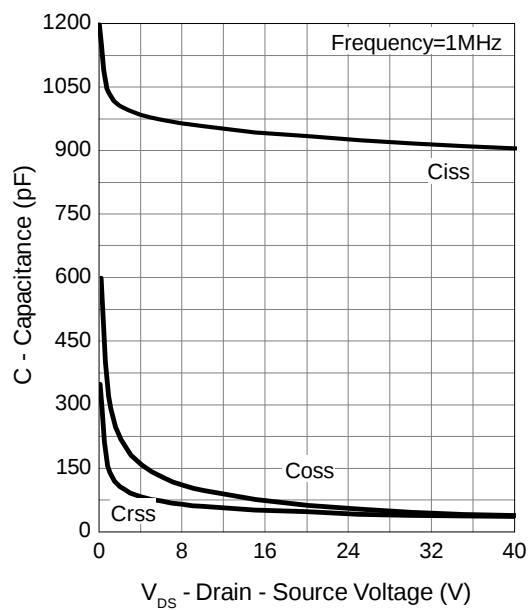
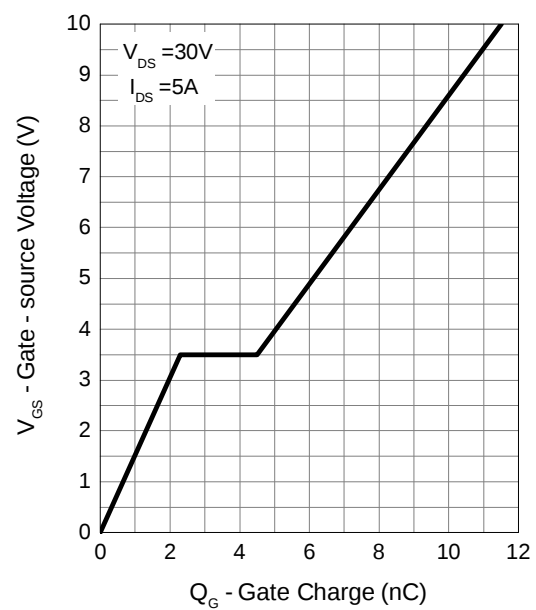
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


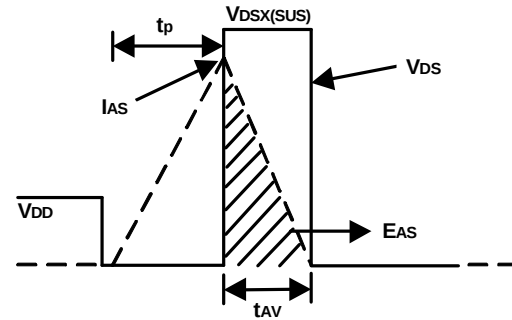
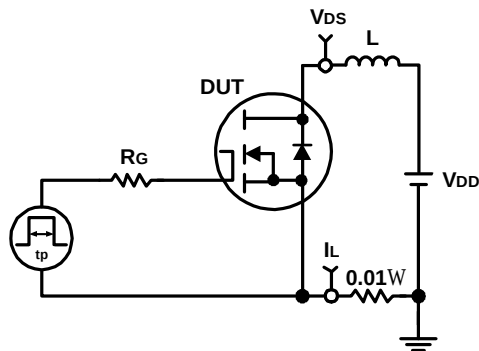
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


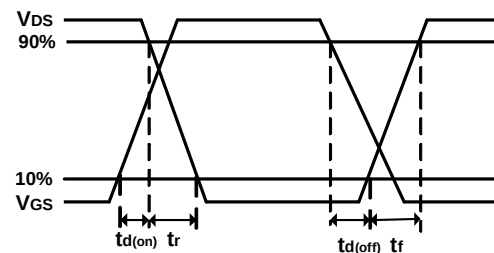
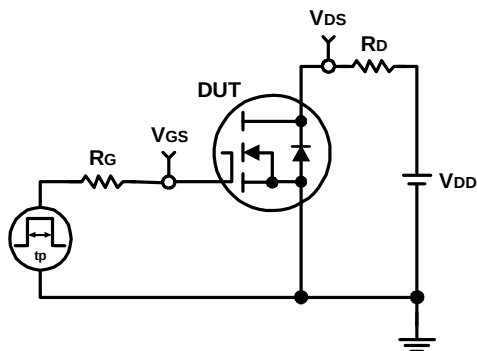
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Avalanche Test Circuit and Waveforms

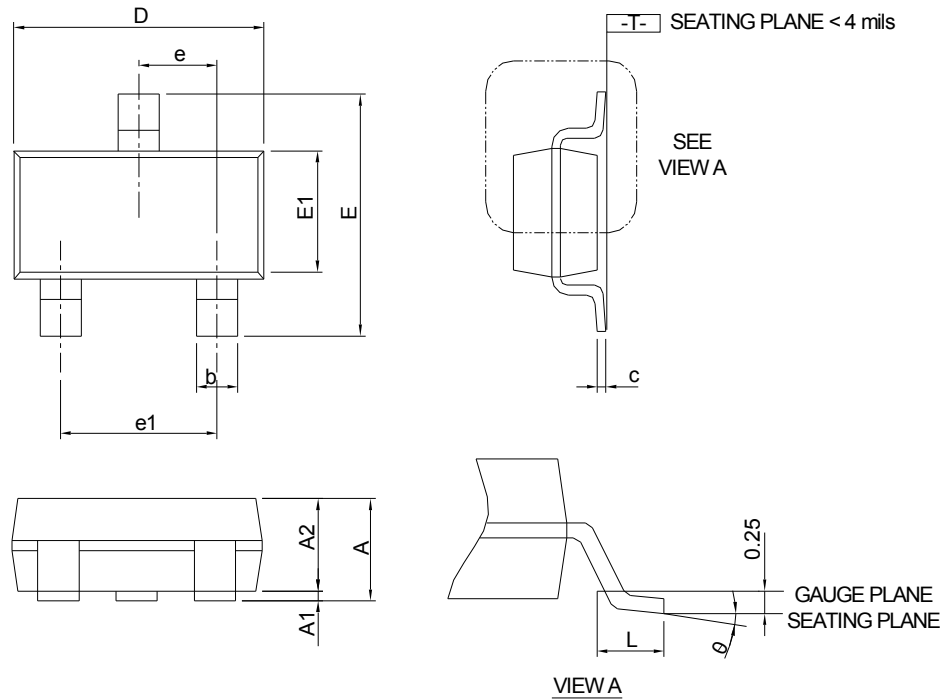


Switching Time Test Circuit and Waveforms



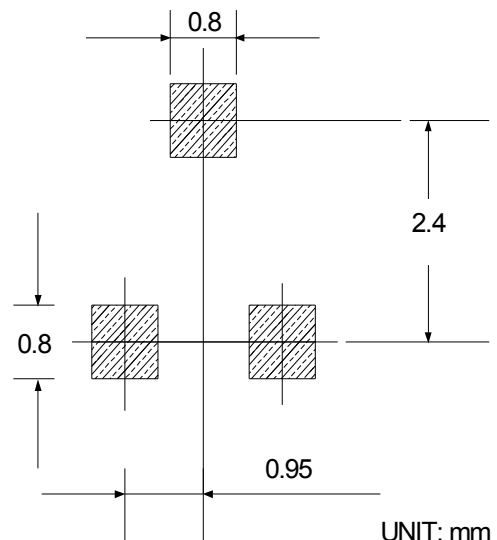
Package Information

SOT-23-3



SYMBOL	SOT-23-3			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.20	-	0.047
A1	0.00	0.08	0.000	0.003
A2	0.90	1.12	0.035	0.044
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	2.60	3.00	0.102	0.118
E1	1.40	1.80	0.055	0.071
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.