

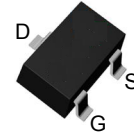
Features

- 20V/6A ,
 $R_{DS(ON)} = 15m\Omega$ (Typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 16m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
 $R_{DS(ON)} = 18m\Omega$ (Typ.) @ $V_{GS} = 2.5V$
 $R_{DS(ON)} = 26m\Omega$ (Typ.) @ $V_{GS} = 1.8V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- ESDProtection

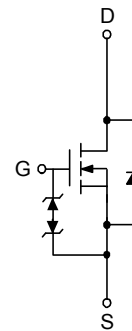
Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems

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
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		± 12	
I_D^*	Continuous Drain Current	$T_A = 25^\circ\text{C}$	6	A
		$T_A = 70^\circ\text{C}$	4.8	
I_{DM}^*	300 μs Pulsed Drain Current	$V_{GS} = 10\text{V}$	20	
I_S^*	Diode Continuous Forward Current		1	A
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	
P_D^*	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	1.4	W
		$T_A = 70^\circ\text{C}$	0.89	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	90	$^\circ\text{C/W}$
		Steady State	110	

Note : *Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$.

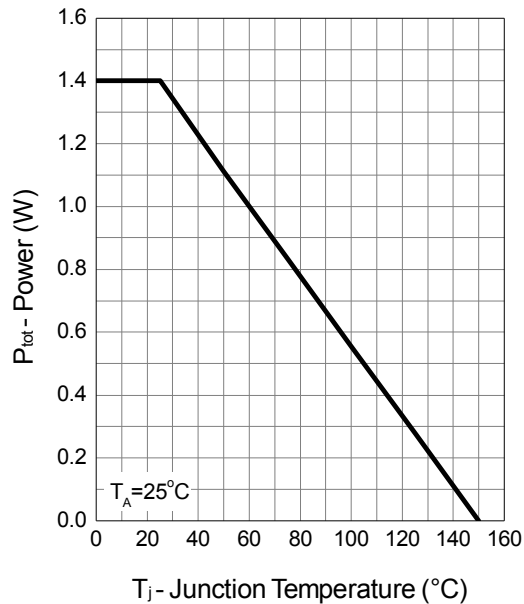
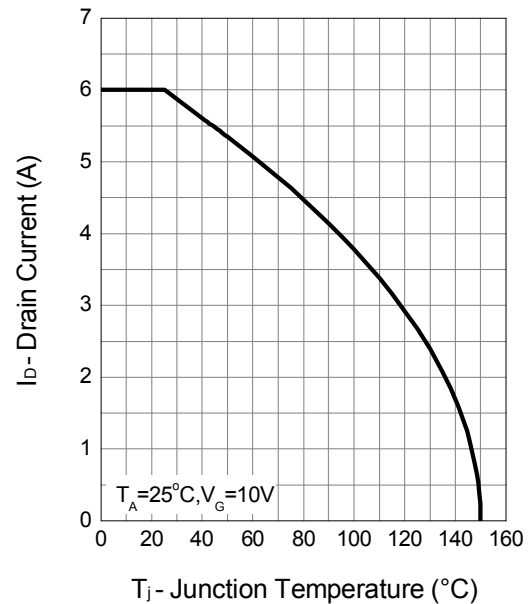
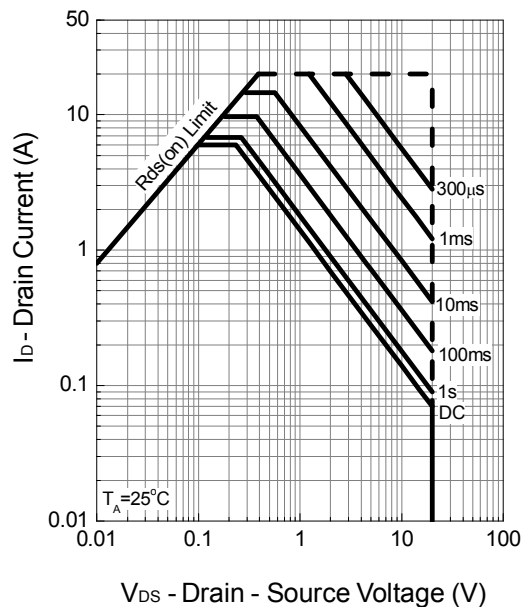
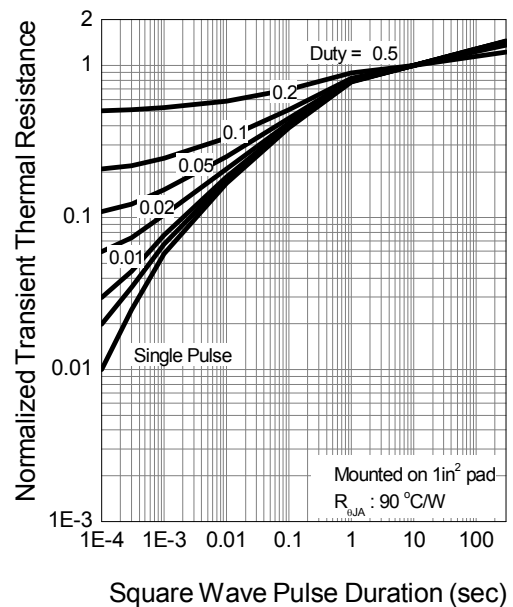
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	XP3416T			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.5	0.75	1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±10V, V _{DS} =0V	-	-	±10	μA
R _{DS(ON)} ^a	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =6A	-	15	20	mΩ
		V _{GS} =4.5V, I _{DS} =6A	-	16	22	
		V _{GS} =2.5V, I _{DS} =2A	-	18	26	
		V _{GS} =1.8V, I _{DS} =1A	-	26	34	
V _{SD} ^a	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.7	1.3	V
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =6A	-	8.6	-	nC
Q _{gs}	Gate-Source Charge		-	0.7	-	
Q _{gd}	Gate-Drain Charge		-	3.2	-	
Dynamic Characteristics ^b						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=1.0MHz	-	460	-	pF
C _{oss}	Output Capacitance		-	115	-	
C _{rss}	Reverse Transfer Capacitance		-	105	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, R _L =10Ω, I _{DS} =1A, V _{GEN} =4.5V, R _G =6Ω	-	4	-	ns
t _r	Turn-on Rise Time		-	14	-	
t _{d(OFF)}	Turn-off Delay Time		-	26	-	
t _f	Turn-off Fall Time		-	7.6	-	
t _{rr}	Reverse Recovery Time	I _{SD} =6A, dI _{SD} /dt=100A/μs	-	18	-	ns
Q _{rr}	Reverse Recovery Charge		-	5.5	-	nC

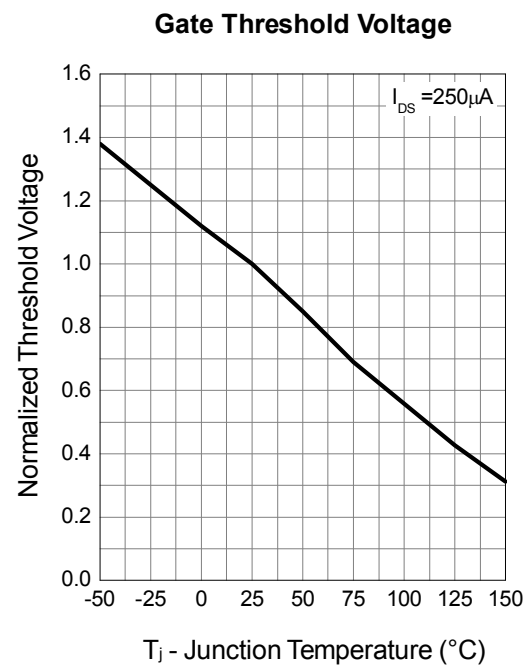
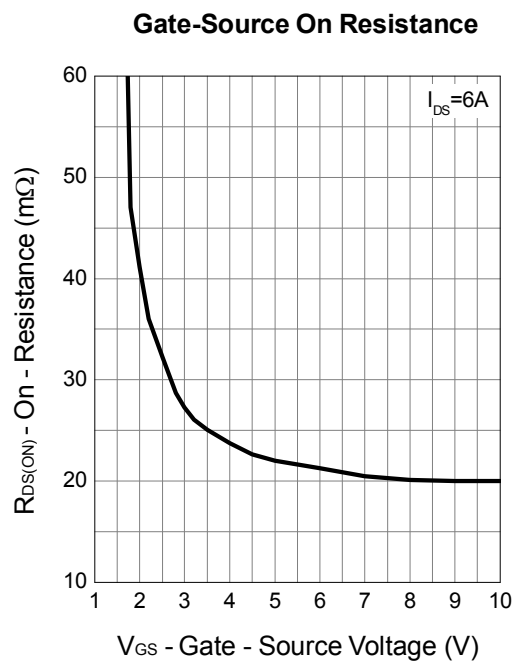
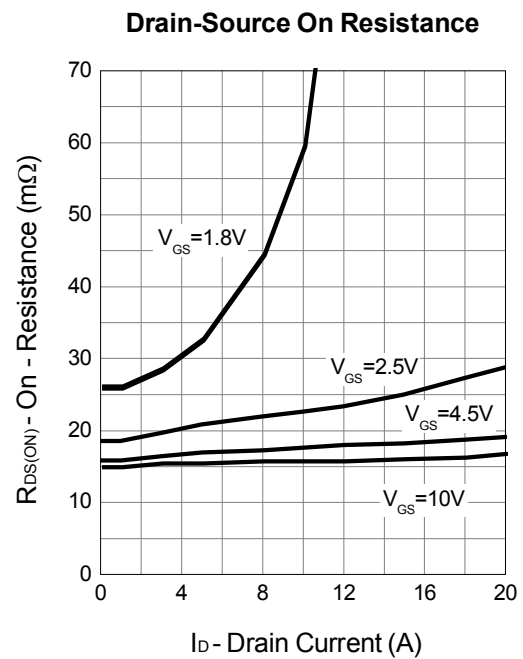
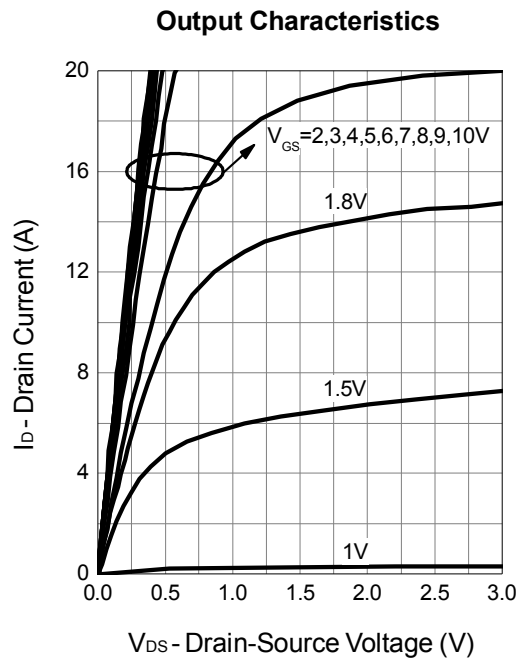
Note a : Pulse test ; pulse width≤300μs, duty cycle≤2%.

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

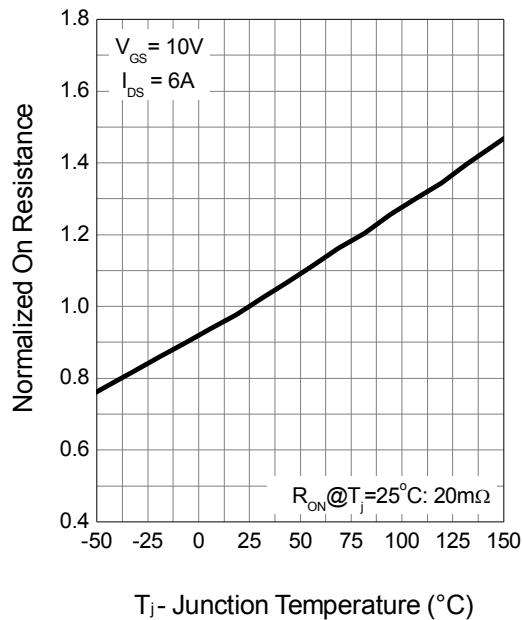
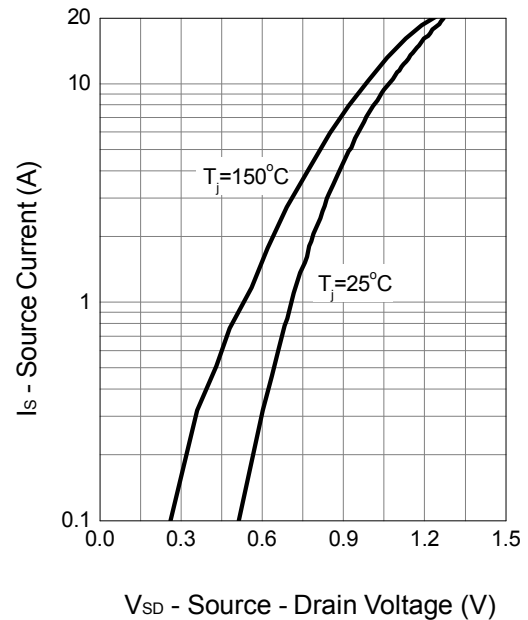
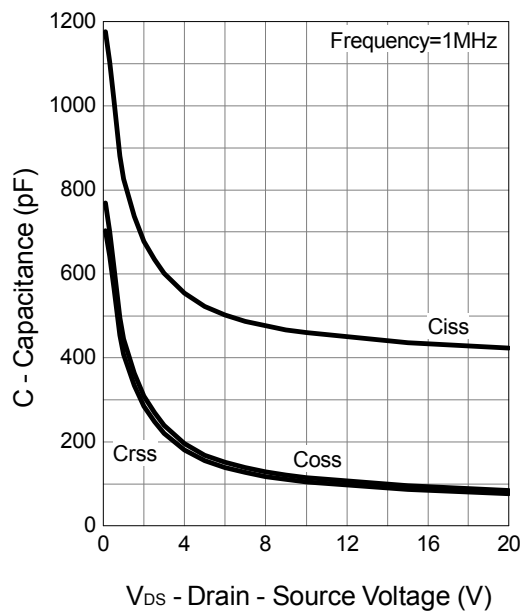
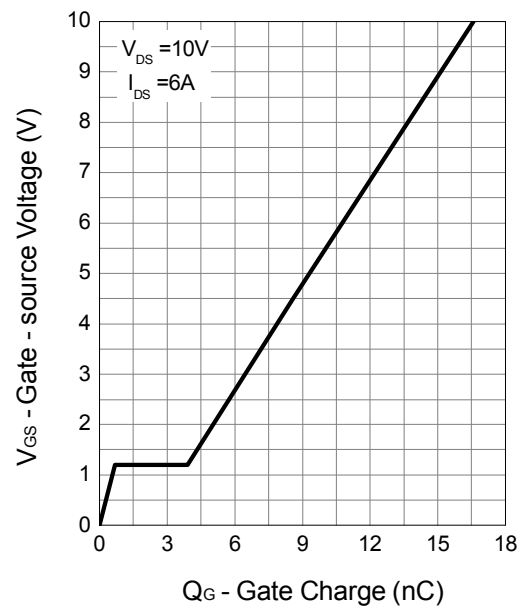
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


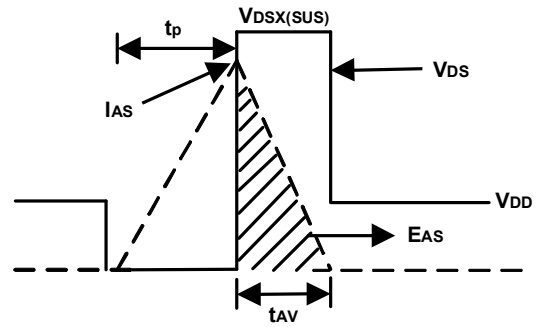
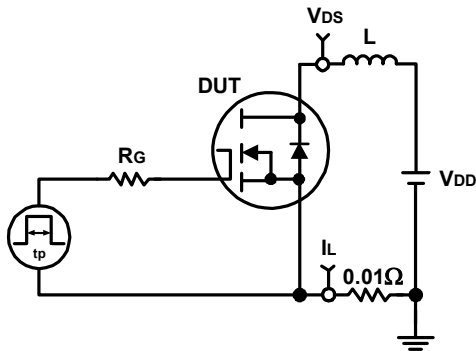
Typical Operating Characteristics (Cont.)



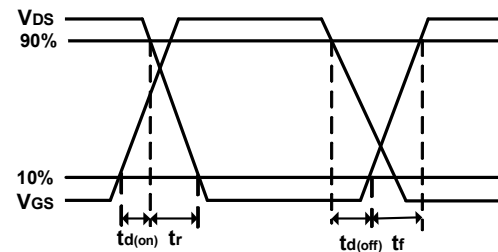
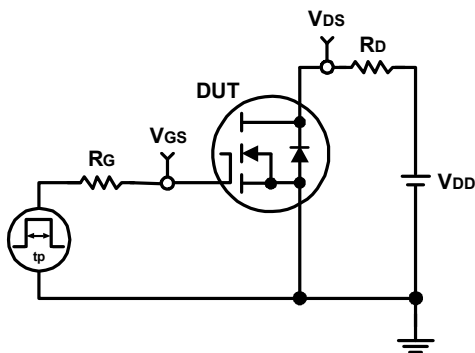
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


Avalanche Test Circuit and Waveforms

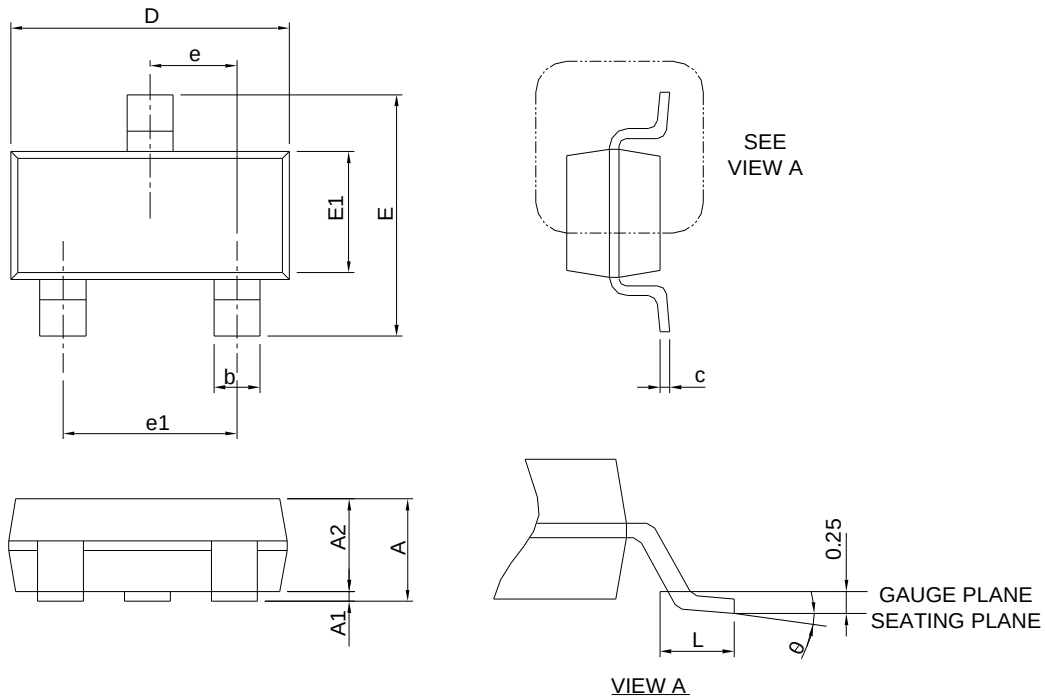


Switching Time Test Circuit and Waveforms



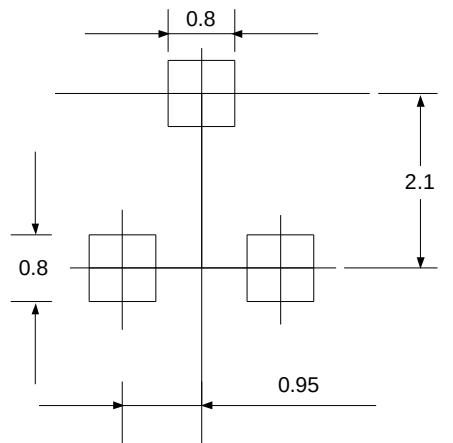
Package Information

SOT-23



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



UNIT: mm

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.