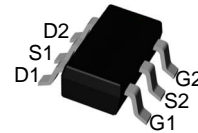


**Dual Enhancement Mode MOSFET (N- and P-Channel)**
**Features**

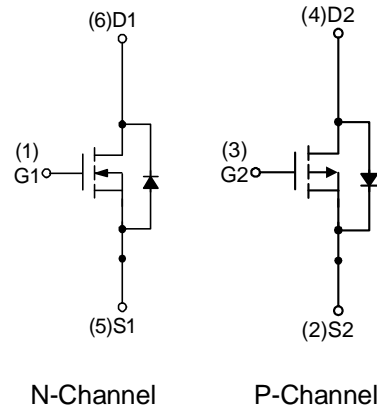
- **N-Channel**  
 30V/4.9A,  
 $R_{DS(ON)}=49m\Omega(max.) @ V_{GS}=4.5V$   
 $R_{DS(ON)}=68m\Omega(max.) @ V_{GS}=2.5V$
- **P-Channel**  
 -30V/-3A,  
 $R_{DS(ON)}=100m\Omega(max.) @ V_{GS}=-4.5V$   
 $R_{DS(ON)}=150m\Omega(max.) @ V_{GS}=-2.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

**Applications**

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

**Pin Description**


Top View of SOT-23-6



Product ID	Pack	Marking	Qty(PCS)
XPX30N49AB	SOT23-6		1000

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

Symbol	Parameter	N Channel	P Channel	Unit	
<b>Common Ratings</b>					
$V_{DSS}$	Drain-Source Voltage	30	-30	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	$\pm 12$	V	
$I_D$	Continuous Drain Current	$T_A=25^\circ\text{C}$	4.9	-3	A
		$T_A=70^\circ\text{C}$	3.9	-2.4	
$I_{DM}$	300 $\mu\text{s}$ Pulsed Drain Current	$V_{GS}=10\text{V}$	19	-12	
$I_S$	Diode Continuous Forward Current	1			
$T_J$	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	
		$T_A=70^\circ\text{C}$	0.9		
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	90	$^\circ\text{C/W}$	
		Steady State	125		

Note: \* Surface Mounted on 1in<sup>2</sup> pad area.

**N Channel Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Test Conditions	N Channel			Unit	
			Min.	Typ.	Max.		
<b>Static Characteristics</b>							
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	30	-	-	V	
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=24V, V_{GS}=0V$ $T_J=85^\circ\text{C}$	-	-	1 30	$\mu A$	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	0.5	0.7	1.0	V	
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA	
$R_{DS(ON)}^a$	Drain-Source On-State Resistance	$V_{GS}=4.5V, I_{DS}=4.9A$ $V_{GS}=2.5V, I_{DS}=3A$	-	39 58	49 68	$m\Omega$	
<b>Diode Characteristics</b>							
$V_{SD}^a$	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$	-	0.75	1.1	V	
$t_{rr}$	Reverse Recovery Time	$I_{SD}=4.9A, di_{SD}/dt=100A/\mu s$	-	9.2	-	ns	
$Q_{rr}$	Reverse Recovery Charge		-	4.3	-	nC	
<b>Dynamic Characteristics<sup>b</sup></b>							
$R_g$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	2.3	-	$\Omega$	
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=15V,$ Frequency=1.0MHz	-	215	-	pF	
$C_{oss}$	Output Capacitance		-	37	-		
$C_{rss}$	Reverse Transfer Capacitance		-	28	-		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=15V, R_L=15\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=6\Omega$	-	5.3	8	ns	
$T_r$	Turn-on Rise Time		-	11	16		
$t_{d(OFF)}$	Turn-off Delay Time		-	12	17		
$T_f$	Turn-off Fall Time		-	2.6	4		
<b>Gate Charge Characteristics<sup>b</sup></b>							
$Q_g$	Total Gate Charge	$V_{DS}=15V,$ $I_{DS}=4.9A$	$V_{GS}=4.5V,$	-	3	-	nC
$Q_{gs}$	Gate-Source Charge	$V_{DS}=15V, V_{GS}=10V,$ $I_{DS}=4.9A$	$V_{GS}=10V$	-	5.8	-	
$Q_{gd}$	Gate-Drain Charge		-	1.1	-		
$Q_{gth}$	Threshold Gate Charge		-	1.5	-		
			-	0.5	-		

Note a: Pulse test; pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .

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

**P Channel Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

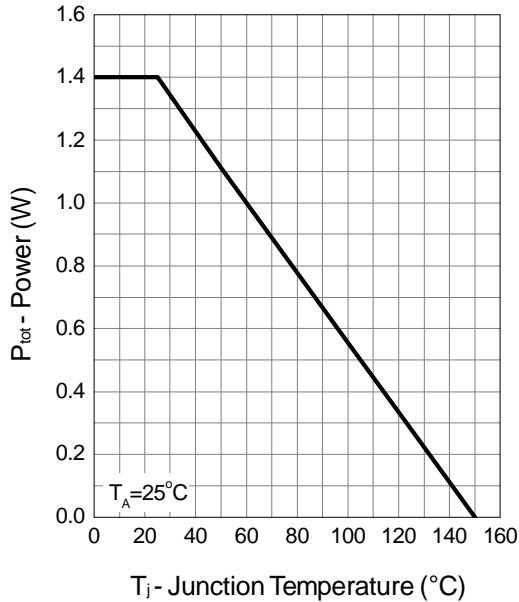
Symbol	Parameter	Test Conditions	P Channel			Unit	
			Min.	Typ.	Max.		
<b>Static Characteristics</b>							
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250\mu A$	-30	-	-	V	
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$	-	-	-1	$\mu A$	
		$T_J=85^\circ C$	-	-	-30		
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-0.5	-0.7	-1.0	V	
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	$\pm 100$	nA	
$R_{DS(ON)}^a$	Drain-Source On-State Resistance	$V_{GS}=-4.5V, I_{DS}=-3A$	-	82	100	m $\Omega$	
		$V_{GS}=-2.5V, I_{DS}=-1.9A$	-	102	150		
<b>Diode Characteristics</b>							
$V_{SD}^a$	Diode Forward Voltage	$I_{SD}=-1A, V_{GS}=0V$	-	-0.75	-1.1	V	
$t_{rr}$	Reverse Recovery Time	$I_{SD}=-3A, dI_{SD}/dt=100A/\mu s$	-	19	-	ns	
$Q_{rr}$	Reverse Recovery Charge		-	14	-	nC	
<b>Dynamic Characteristics<sup>b</sup></b>							
$R_g$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	7	-	$\Omega$	
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-15V,$ Frequency=1.0MHz	-	229	-	pF	
$C_{oss}$	Output Capacitance		-	42	-		
$C_{rss}$	Reverse Transfer Capacitance		-	33	-		
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-15V, R_L=15\Omega,$ $I_{DS}=-1A, V_{GEN}=-10V,$ $R_G=6\Omega$	-	7.2	-	ns	
$T_r$	Turn-on Rise Time		-	9.3	-		
$t_{d(OFF)}$	Turn-off Delay Time		-	15.4	-		
$T_f$	Turn-off Fall Time		-	3.6	-		
<b>Gate Charge Characteristics<sup>b</sup></b>							
$Q_g$	Total Gate Charge	$V_{DS}=-15V,$ $I_{DS}=-3A$	$V_{GS}=-4.5V,$	-	3.3	-	nC
			$V_{GS}=-10V$	-	6.5	-	
$Q_{gs}$	Gate-Source Charge	$V_{DS}=-15V, V_{GS}=-10V,$ $I_{DS}=-3A$	-	1.1	-		
$Q_{gd}$	Gate-Drain Charge		-	1.1	-		
$Q_{gth}$	Threshold Gate Charge		-	0.6	-		

Note a: Pulse test; pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .

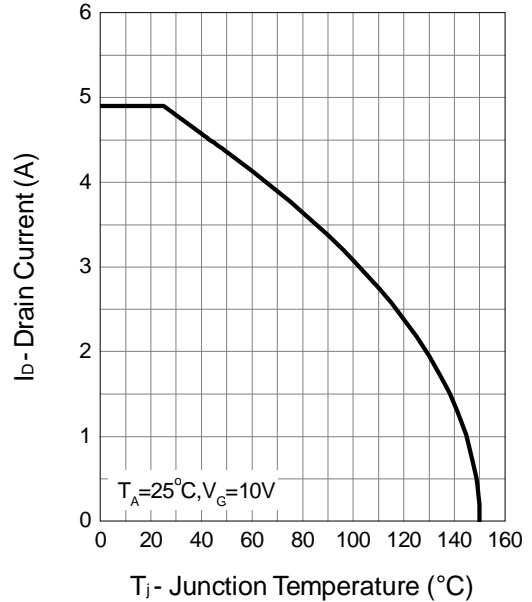
Note b: Guaranteed by design, not subject to production testing.

## N Channel Typical Operating Characteristics

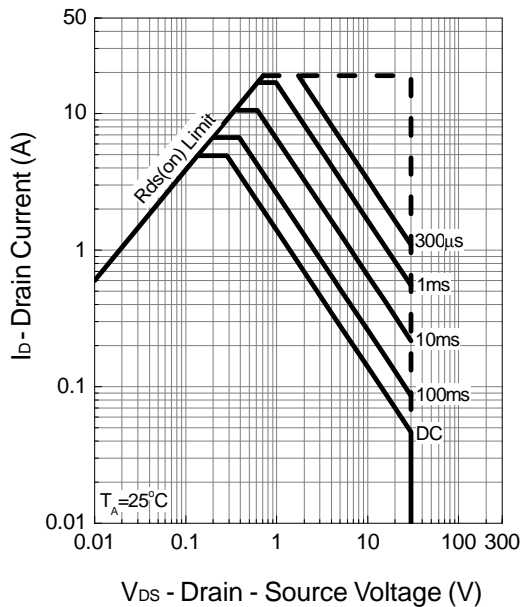
**Power Dissipation**



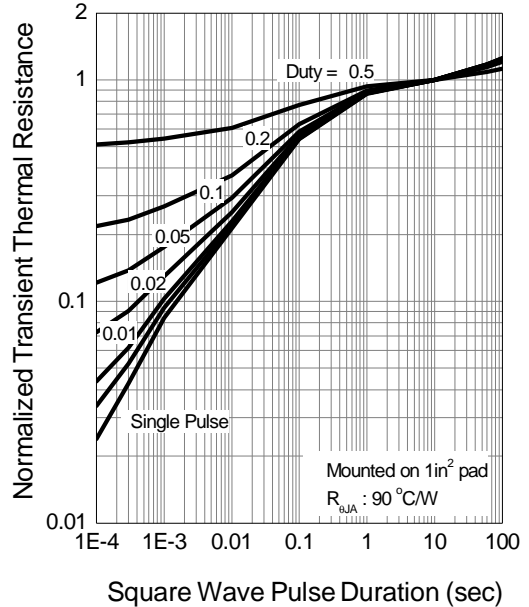
**Drain Current**



**Safe Operation Area**

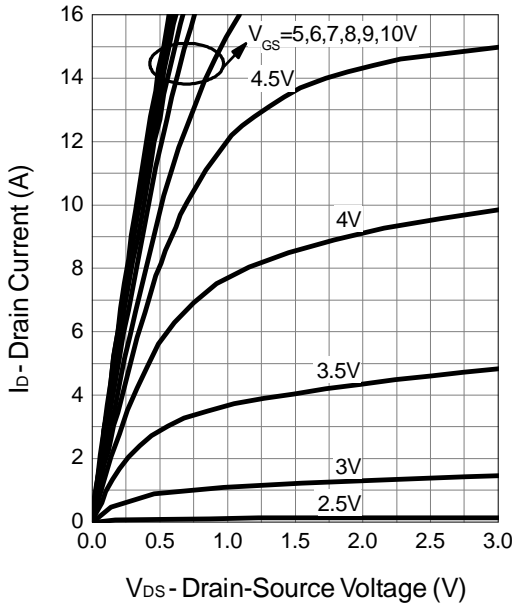


**Thermal Transient Impedance**

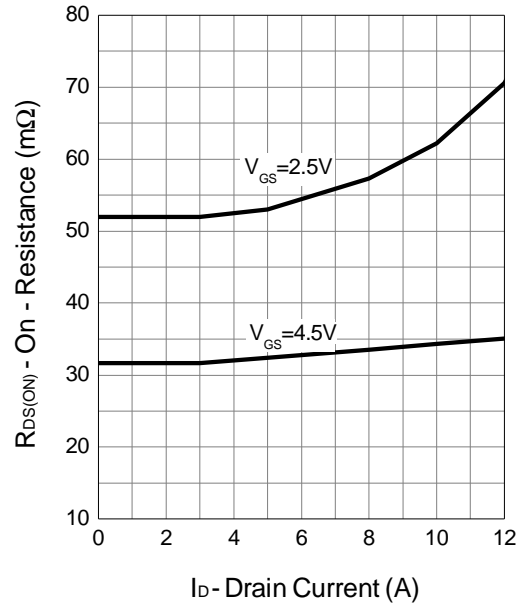


**N Channel Typical Operating Characteristics (Cont.)**

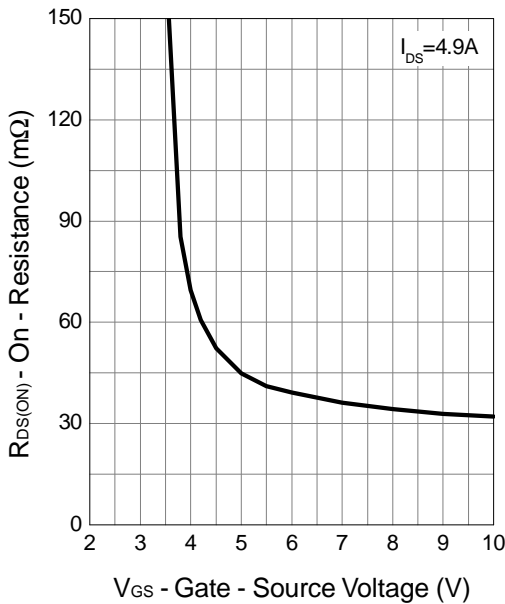
**Output Characteristics**



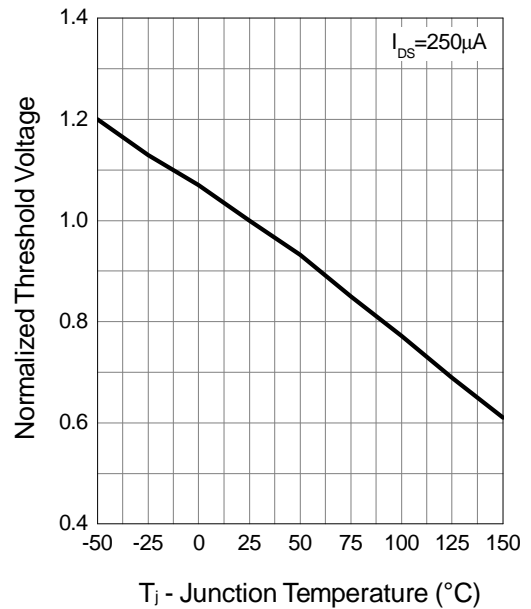
**Drain-Source On Resistance**



**Gate-Source On Resistance**

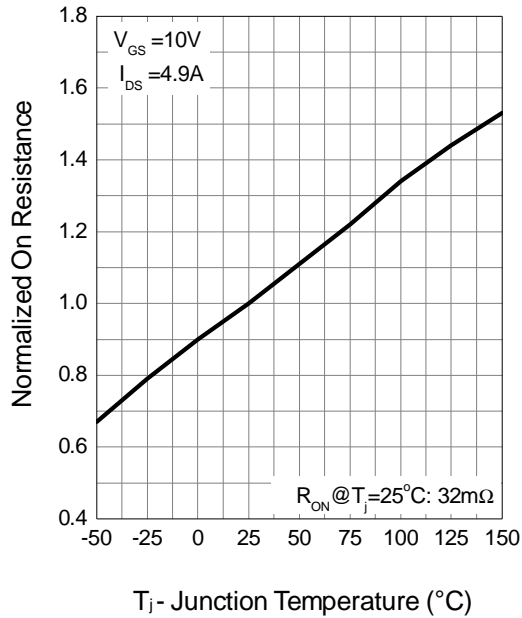


**Gate Threshold Voltage**

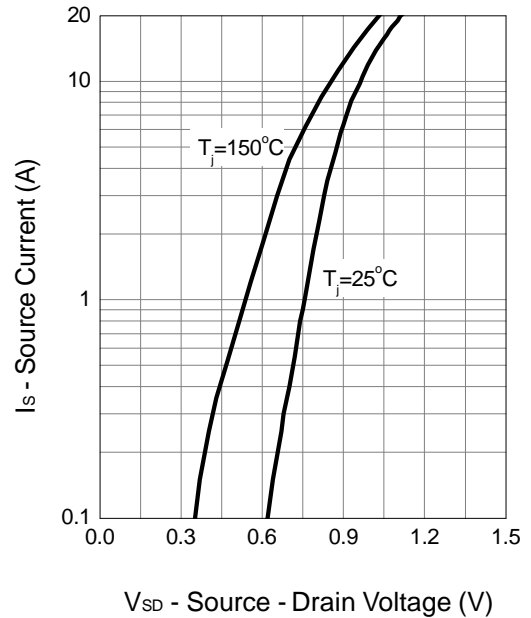


**N Channel Typical Operating Characteristics (Cont.)**

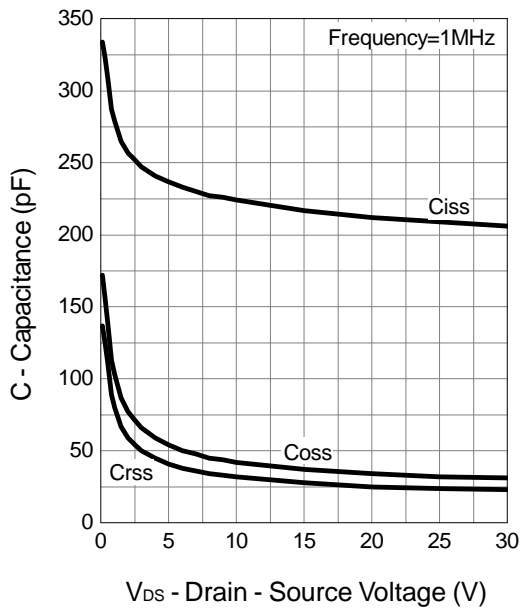
**Drain-Source On Resistance**



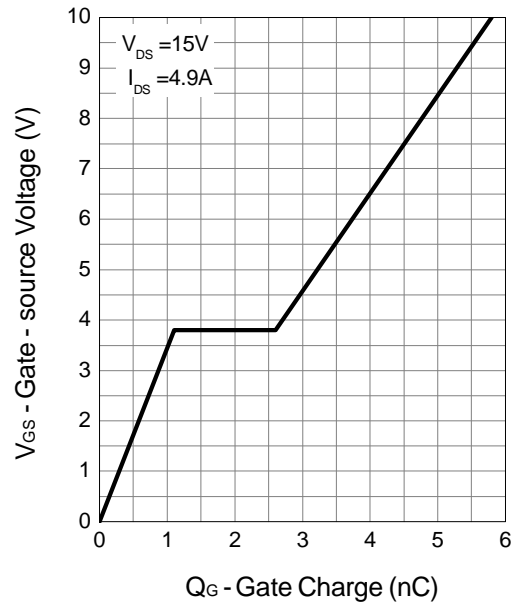
**Source-Drain Diode Forward**



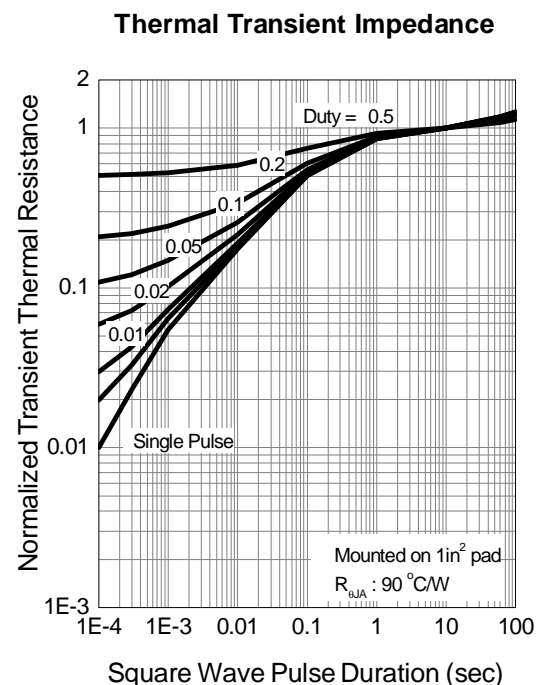
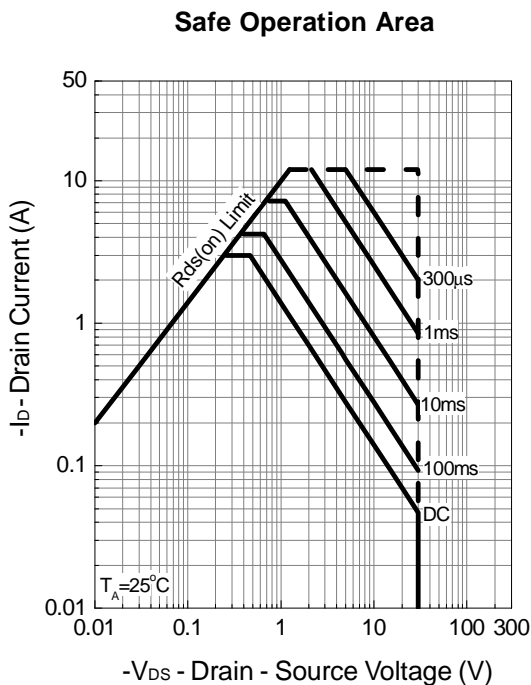
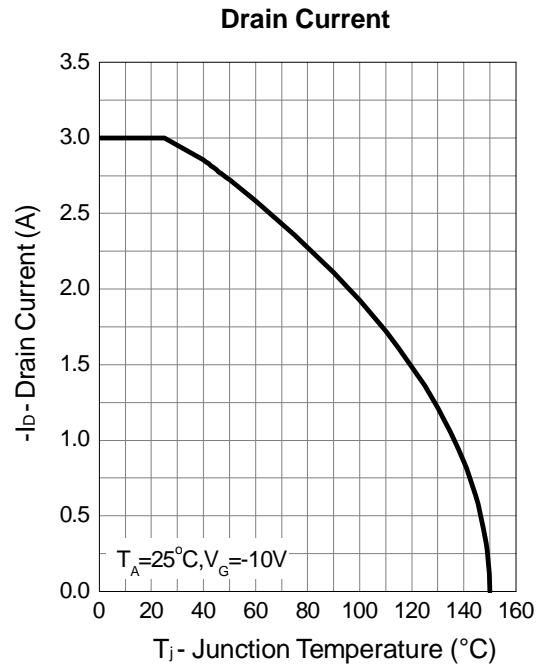
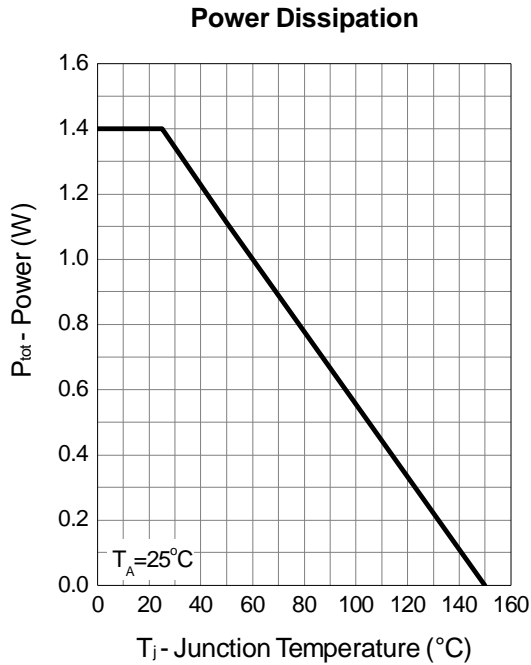
**Capacitance**



**Gate Charge**

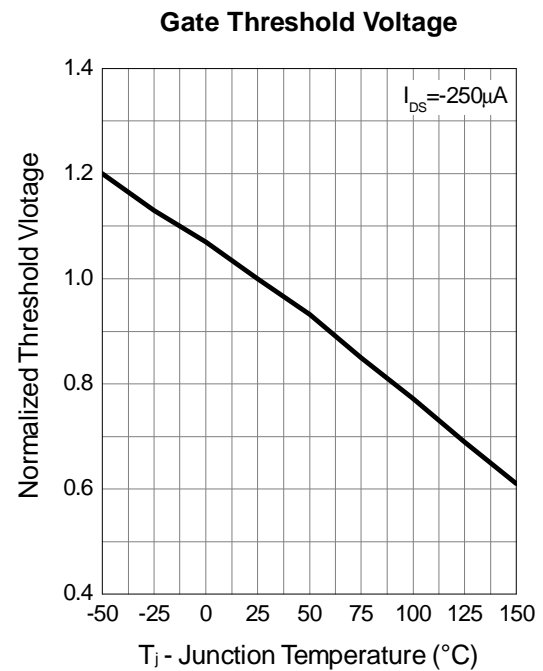
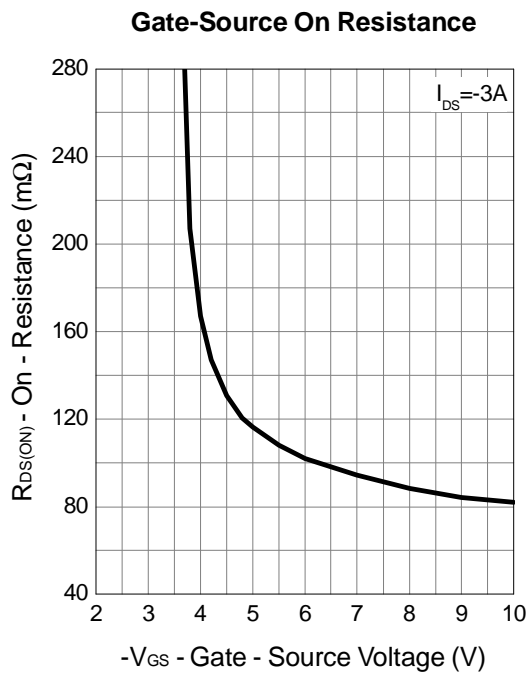
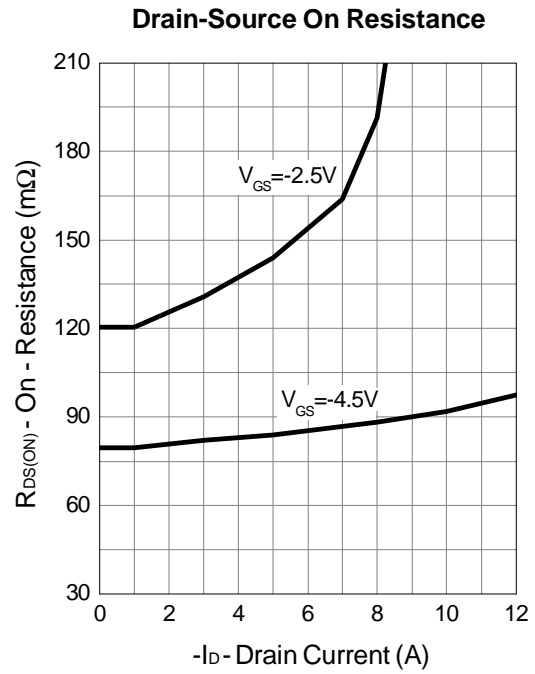
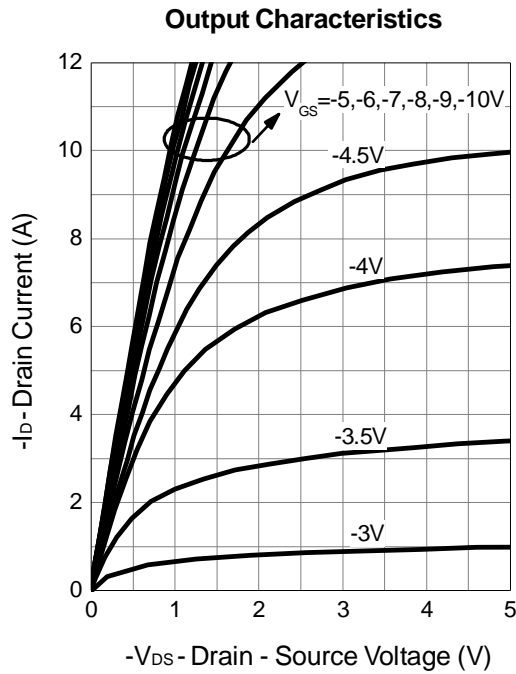


## P Channel Typical Operating Characteristics



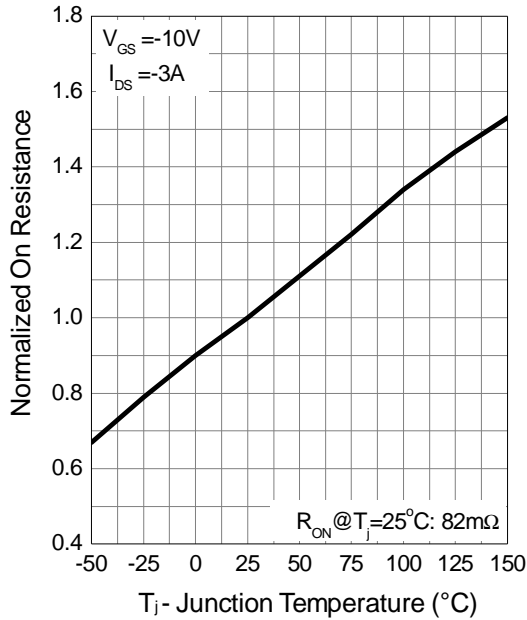


## P Channel Typical Operating Characteristics (Cont.)

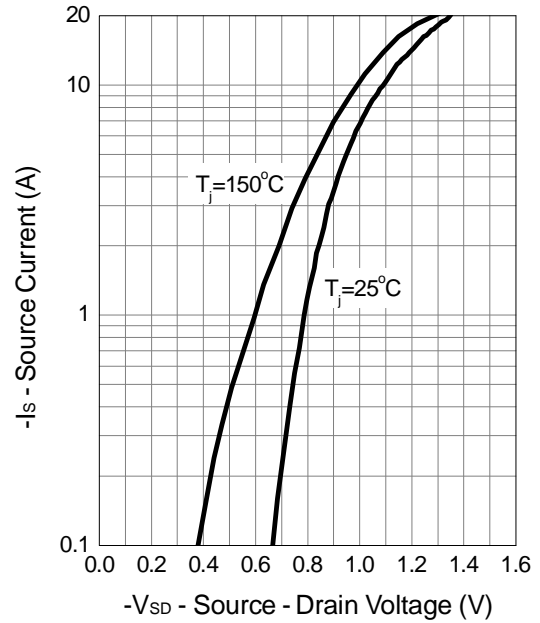


**P Channel Typical Operating Characteristics (Cont.)**

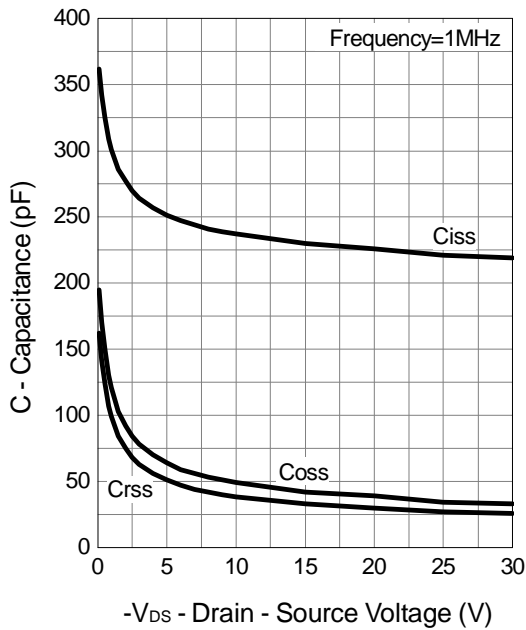
**Drain-Source On Resistance**



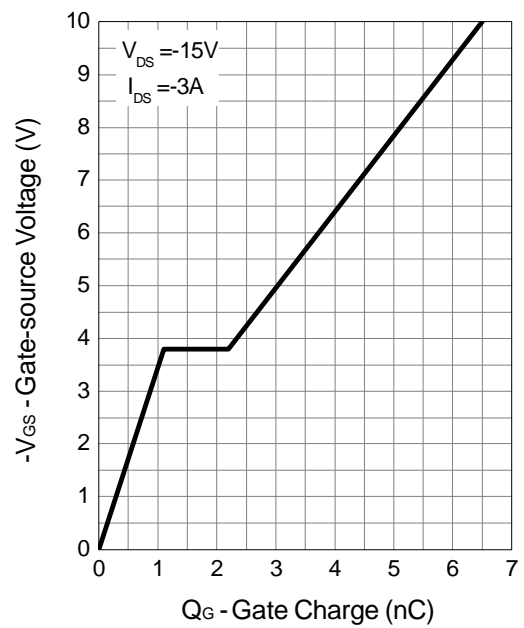
**Source-Drain Diode Forward**



**Capacitance**

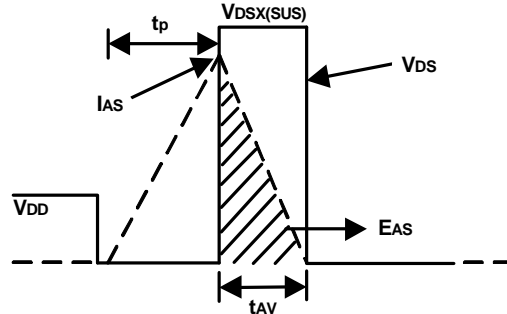
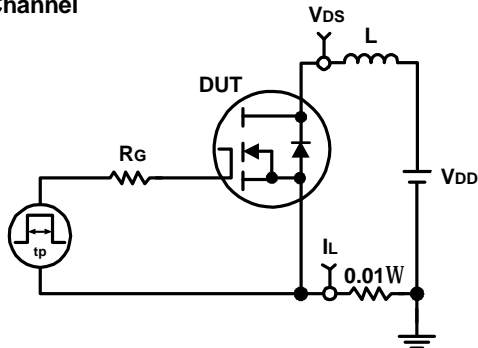


**Gate Charge**

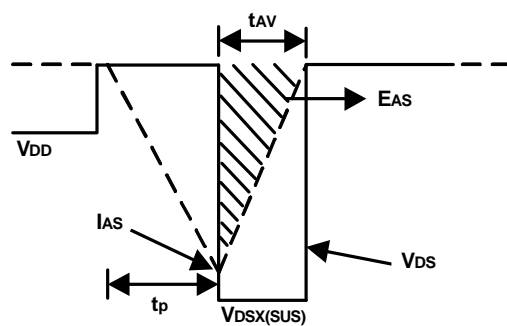
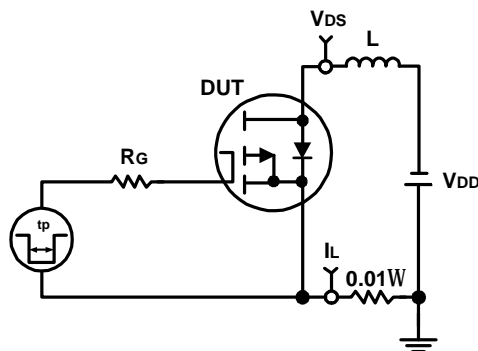


## Avalanche Test Circuit and Waveforms

N Channel

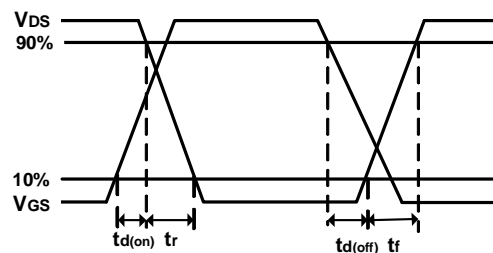
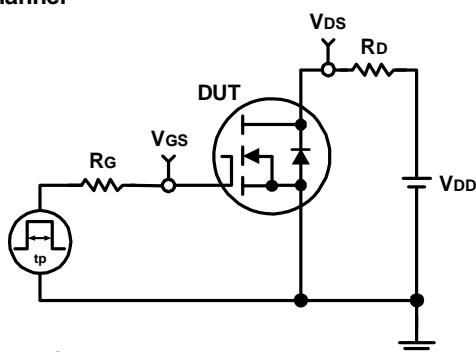


P Channel

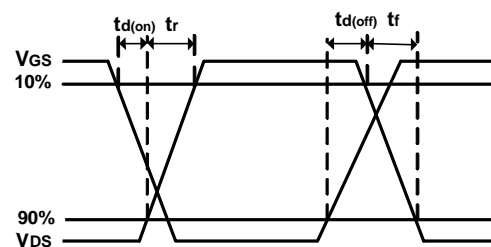
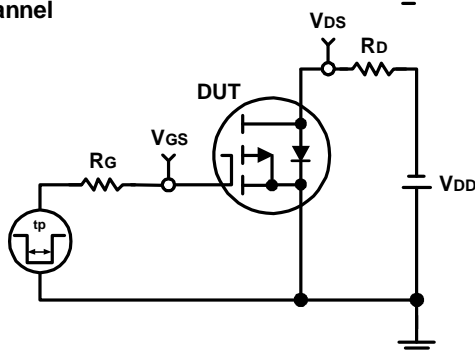


## Switching Time Test Circuit and Waveforms

N Channel

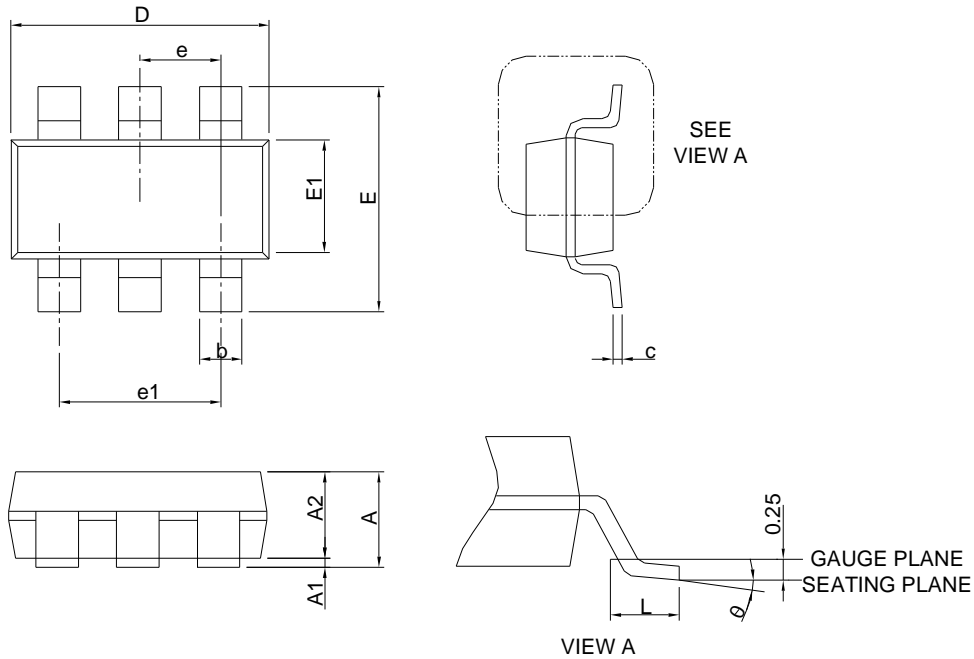


P Channel



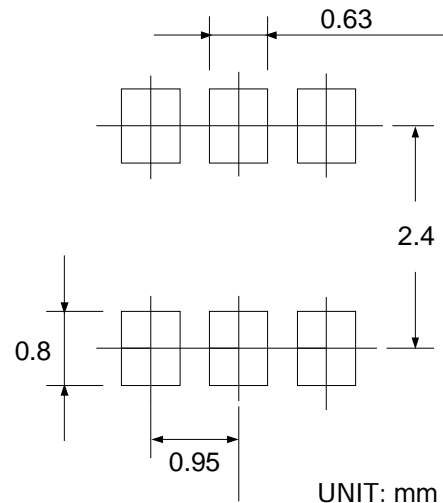
## Package Information

SOT-23-6



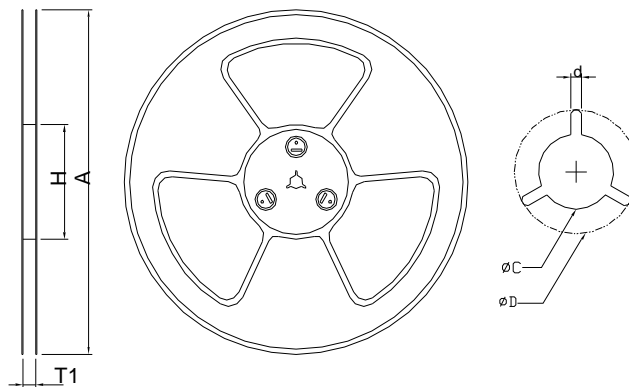
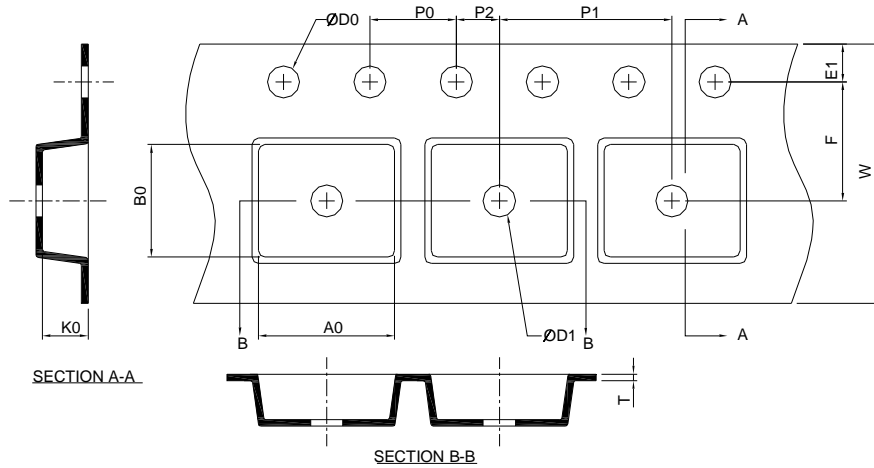
SYMBOL	SOT-23-6			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.25	-	0.049
A1	0.00	0.05	0.000	0.002
A2	0.90	1.20	0.035	0.047
b	0.30	0.50	0.012	0.020
c	0.08	0.22	0.003	0.009
D	2.70	3.10	0.106	0.122
E	2.60	3.00	0.102	0.118
E1	1.40	1.80	0.055	0.071
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
$\theta$	0°	8°	0°	8°

### RECOMMENDED LAND PATTERN



- Note : 1. Follow JEDEC TO-178 AB.  
 2. 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.

### Carrier Tape & Reel Dimensions



Application	A	H	T1	C	d	D	W	E1	F
SOT-23-6	178.0±2.00	50 MIN.	8.4+2.00 -0.00	13.0+0.50 -0.20	1.5 MIN.	20.2 MIN.	8.0±0.30	1.75±0.10	3.5±0.05
	<b>P0</b>	<b>P1</b>	<b>P2</b>	<b>D0</b>	<b>D1</b>	<b>T</b>	<b>A0</b>	<b>B0</b>	<b>K0</b>
	4.0±0.10	4.0±0.10	2.0±0.05	1.5+0.10 -0.00	1.0 MIN.	0.6+0.00 -0.40	3.20±0.20	3.10±0.20	1.50±0.20

(mm)