



SPC6801

P-Channel Trench MOSFET with Schottky Diode

DESCRIPTION

The SPC6801 combines the Trench MOSFET technology with a very low forward voltage drop Schottky barrier rectifier in an TSOP-6P package. The Trench MOSFET is the P-Channel enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology. This high density process is especially tailored to minimize on-state resistance and provide superior switching performance. The Schottky diode is provided to facilitate the implementation of a bidirectional blocking switch, or for DC-DC conversion applications.

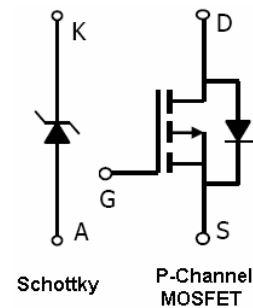
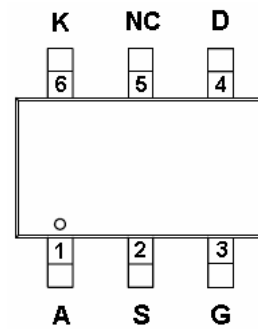
FEATURES

- ◆ P-Channel
 - 30V/-2.8A, RDS(ON)=105mΩ@VGS=-10V
 - 30V/-2.5A, RDS(ON)=115mΩ@VGS=-4.5V
 - 30V/-1.5A, RDS(ON)=150mΩ@VGS=-2.5V
- ◆ Schottky
 - VKA (V) = 20V, IF = 1A, VF<0.5V@0.5A
- ◆ Super high density cell design for extremely low RDS (ON)
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TSOP- 6P package design

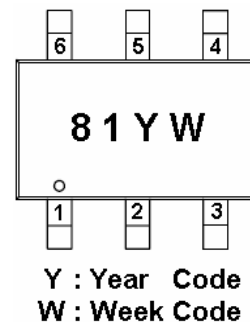
APPLICATIONS

- Battery Powered System
- DC/DC Converter
- Load Switch
- Cell Phone

PIN CONFIGURATION(TSOP- 6P)



PART MARKING





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PIN DESCRIPTION

Pin	Symbol	Description
1	A	Schottky Anode
2	S	MOSFET Source
3	G	MOSFET Gate
4	D	MOSFET Drain
5	NC	No Connect
6	K	Schottky Cathode

ORDERING INFORMATION

Part Number	Package	Part Marking
SPC6801ST6RG	TSOP- 6P	81YW

※ Week Code : A ~ Z (1 ~ 26) ; a ~ z (27 ~ 52)

※ SPC6801ST6RG : Tape Reel ; Pb – Free

ABSOLUTE MAXIMUM RATINGS

($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Parameter	Symbol	Typical		Unit
		P-Channel	Schottky	
Drain-Source Voltage	V_{DSS}	-30		V
Gate –Source Voltage	V_{GSS}	± 12		V
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	I_D	$T_A=25^{\circ}\text{C}$	-2.8	A
		$T_A=70^{\circ}\text{C}$	-2.1	
Pulsed Drain Current	I_{DM}	-10		A
Schottky Reverse Voltage	V_{KA}		20	V
Continuous Forward Current	I_F	$T_A=25^{\circ}\text{C}$	1	A
		$T_A=70^{\circ}\text{C}$	0.7	
Pulsed Forward Current	I_{FM}		10	A
Continuous Source Current(Diode Conduction)	I_S	-1.4		A
Power Dissipation	P_D	$T_A=25^{\circ}\text{C}$	1.15	W
		$T_A=70^{\circ}\text{C}$	0.75	
Operating Junction Temperature	T_J	-55/150		$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55/150		$^{\circ}\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	$T \leq 10\text{sec}$	52	$^{\circ}\text{C}/\text{W}$
		Steady State	90	



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ELECTRICAL CHARACTERISTICS

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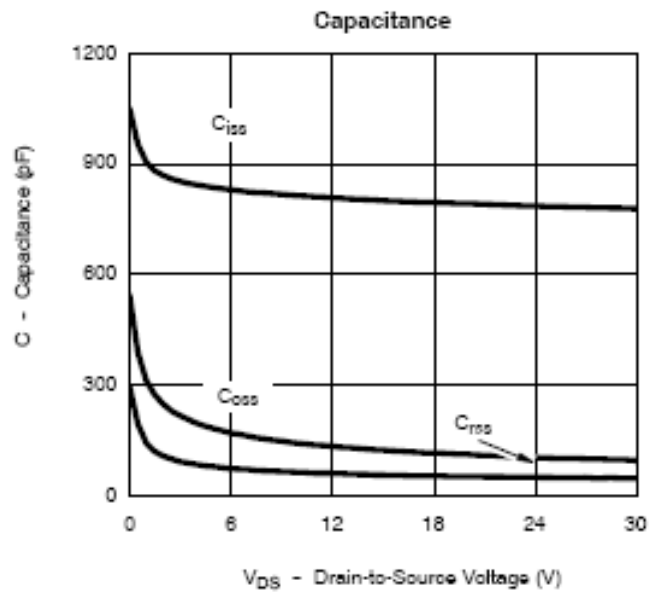
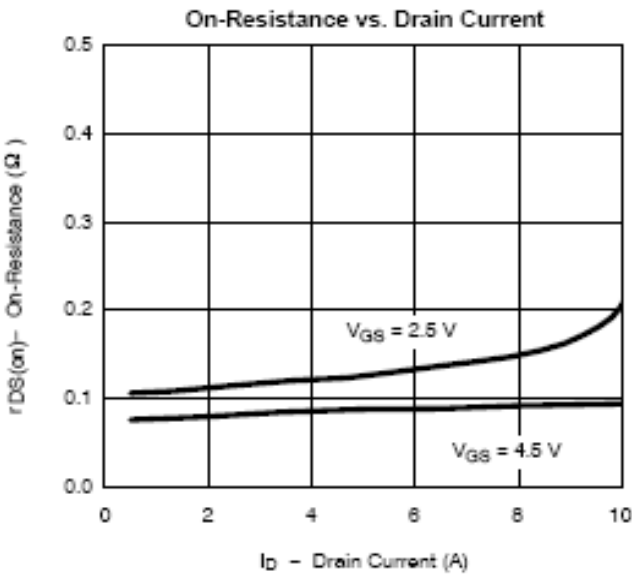
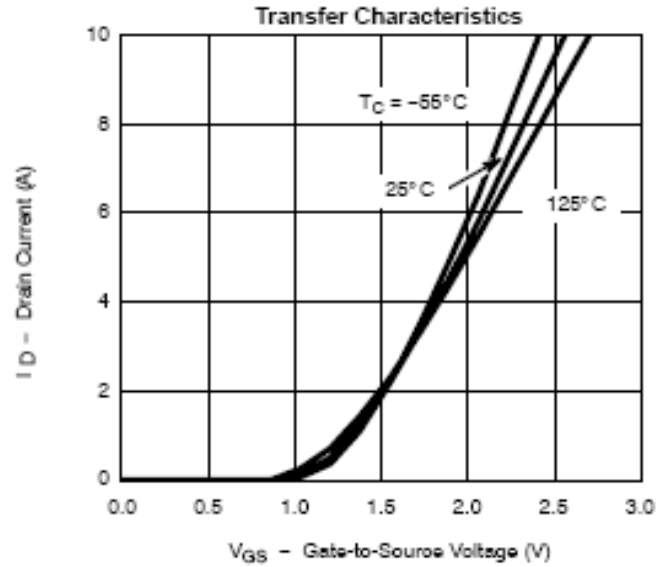
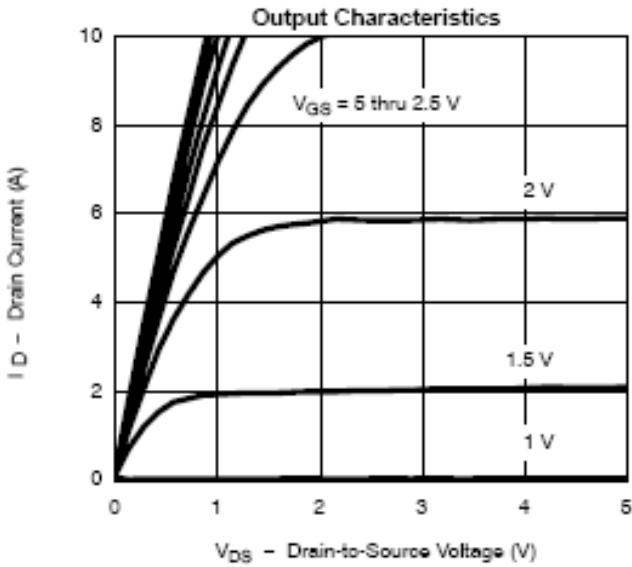
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
MOSFET Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-10\mu A$	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4		-1.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-24V, V_{GS}=0V$			-1	uA
		$V_{DS}=-24V, V_{GS}=0V$ $T_J=55^{\circ}\text{C}$			-10	
On-State Drain Current	$I_{D(on)}$	$V_{DS}=-5V, V_{GS}=-4.5V$	-4			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-2.8A$		0.085	0.105	Ω
		$V_{GS}=-4.5V, I_D=-2.5A$		0.100	0.115	
		$V_{GS}=-2.5V, I_D=-1.5A$		0.135	0.150	
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-2.8A$		4.0		S
Diode Forward Voltage	V_{SD}	$I_S=-1.2A, V_{GS}=0V$		-0.8	-1.2	V
MOSFET Dynamic						
Total Gate Charge	Q_g	$V_{DS}=-15V, V_{GS}=-4.5V$ $I_D=-2.0A$		5.8		nC
Gate-Source Charge	Q_{gs}			0.8		
Gate-Drain Charge	Q_{gd}			1.5		
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V$ $f=1\text{MHz}$		380		pF
Output Capacitance	C_{oss}			55		
Reverse Transfer Capacitance	C_{rss}			40		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-15V, R_L=15\Omega$ $I_D=-1.0A, V_{GEN}=-10V$ $R_G=3\Omega$		6		ns
	t_r			3.9		
Turn-Off Time	$t_{d(off)}$			40		
	t_f			15		
Schottky Parameters						
Forward Voltage Drop	V_F	$I_F=500\text{mA}$		0.41	0.47	V
Reverse Breakdown Voltage	V_{BR}	$I_R=500\mu A$	20			V
Maximum reverse leakage current	I_{rm}	$V_R=20V$			0.1	mA
		$V_R=20V, T_J=70^{\circ}\text{C}$			1	
Junction Capacitance	C_T	$V_R=10V$		31		pF
		$V_R=0V, f=1\text{MHz}$		120		
Schottky Reverse Recovery Time	T_{rr}	$I_F=1A, dI/dt=100A/\mu s$		5.4	10	ns
Schottky Reverse Recovery Charge	Q_{rr}	$I_F=1A, dI/dt=100A/\mu s$		0.8		nC



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TYPICAL CHARACTERISTICS (P-Channel MOSFET)

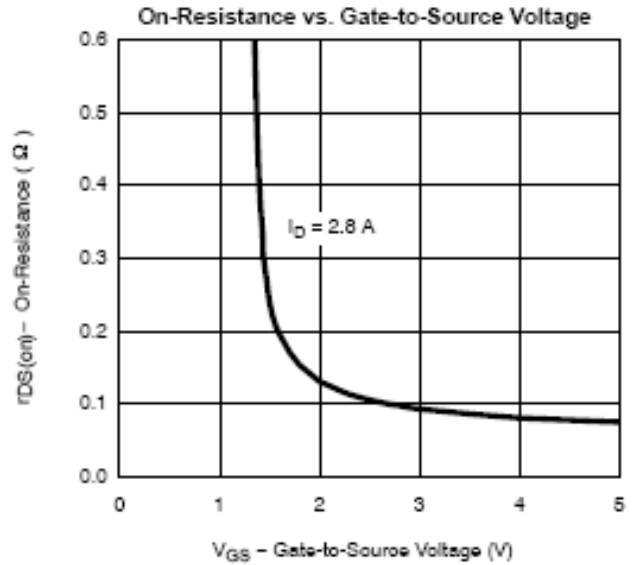
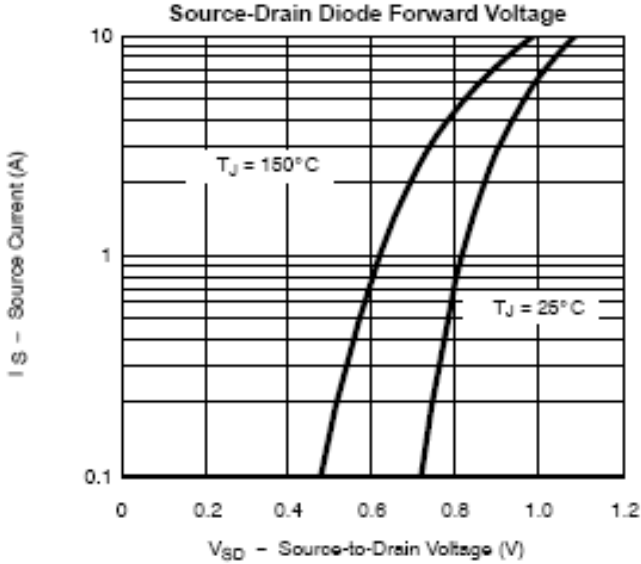
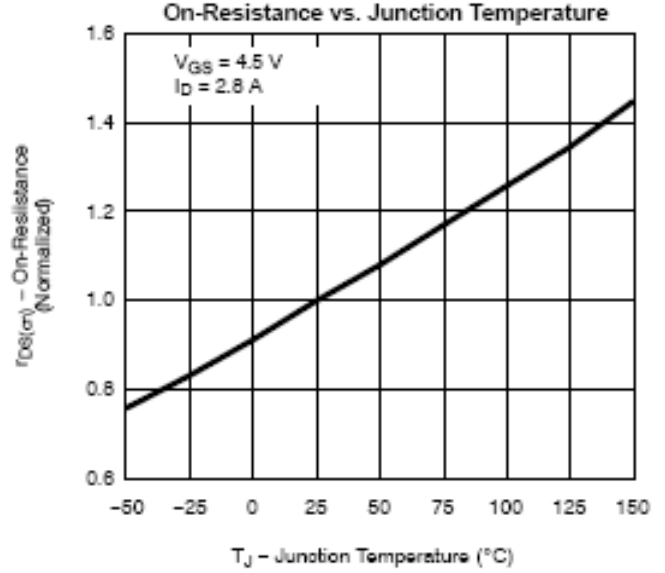
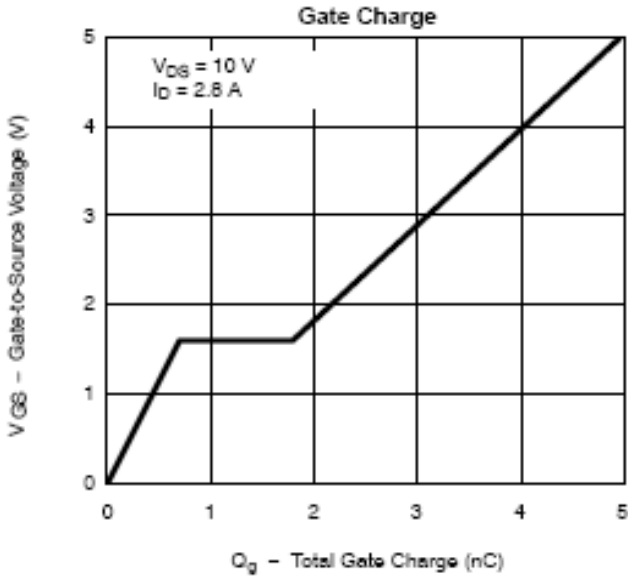




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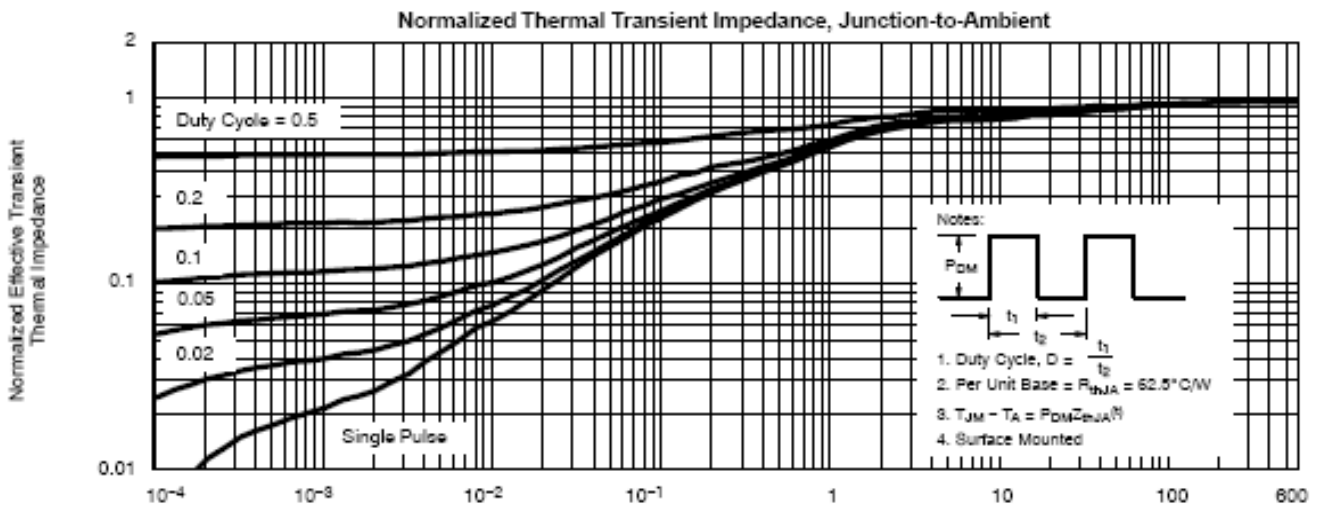
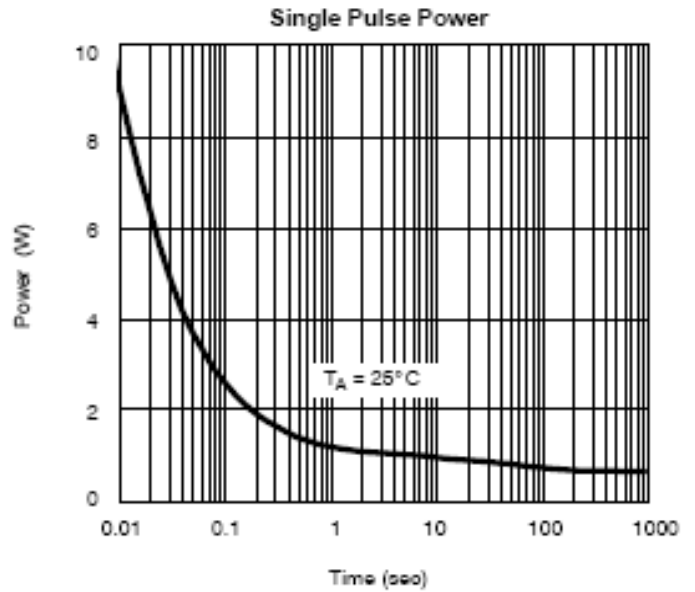
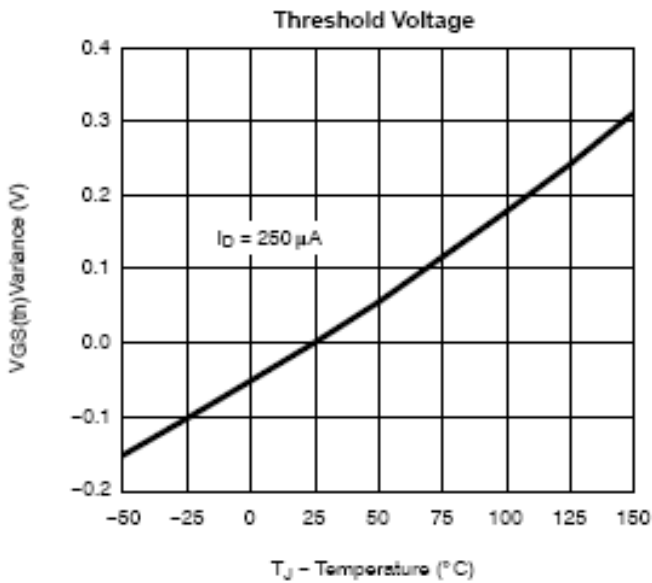




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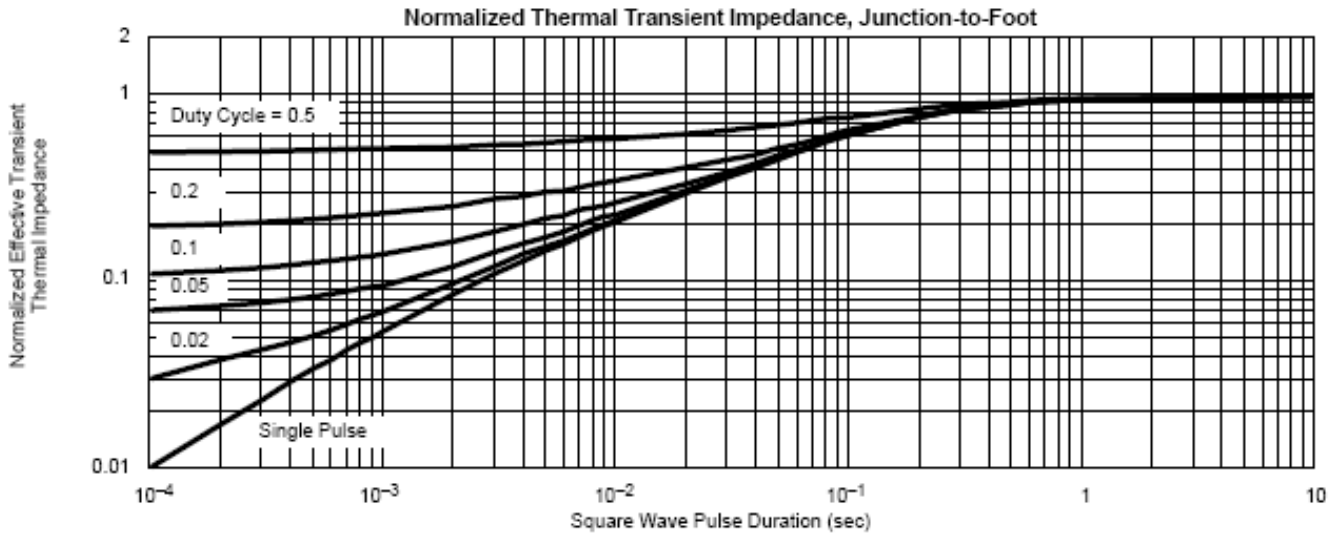
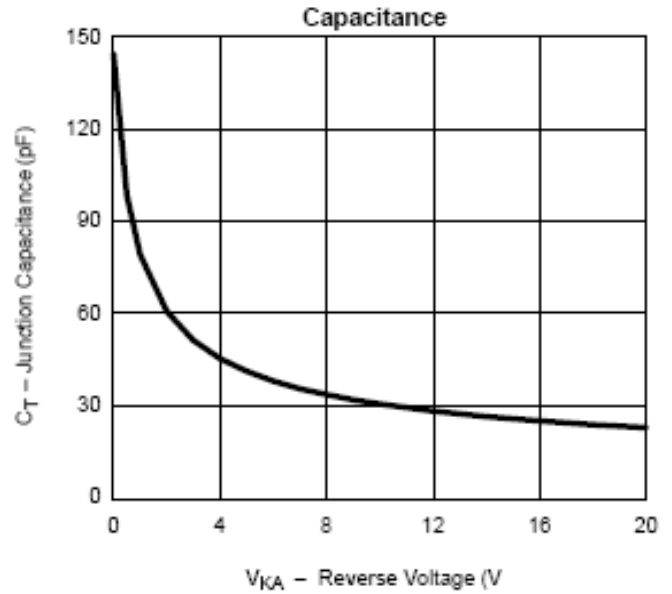
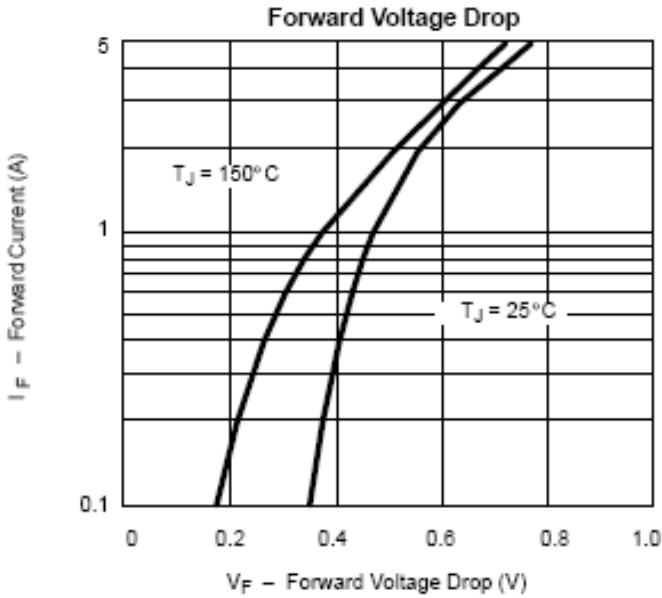




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TYPICAL CHARACTERISTICS (Schottky)

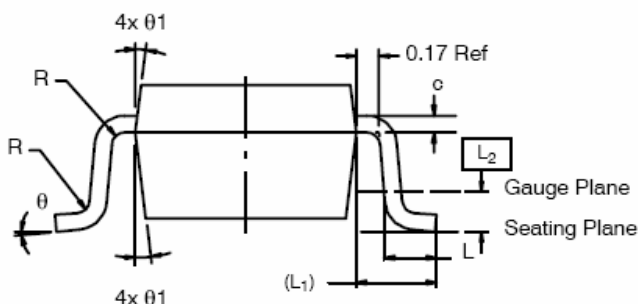
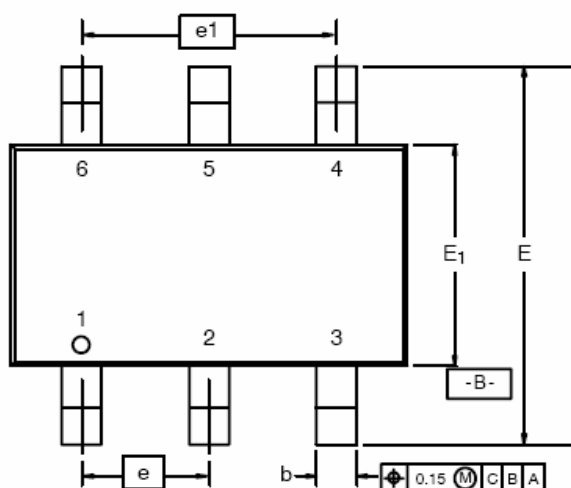




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TSOP- 6P PACKAGE OUTLINE



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	-	1.10	0.036	-	0.043
A₁	0.01	-	0.10	0.0004	-	0.004
A₂	0.90	-	1.00	0.035	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.98	0.106	0.112	0.117
E₁	1.55	1.65	1.70	0.061	0.065	0.067
e	1.00 BSC			0.0394 BSC		
e₁	1.90	2.00	2.10	0.075	0.080	0.085
L	0.35	-	0.50	0.014	-	0.020
L₁	0.60 Ref			0.024 Ref		
L₂	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
θ₁	7° Nom			7° Nom		



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