SPC6801

P-Channel Trench MOSFET with Schottky Diode

DESCRIPTION

The SPC6801combines 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.

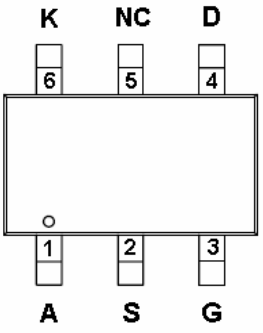
APPLICATIONS

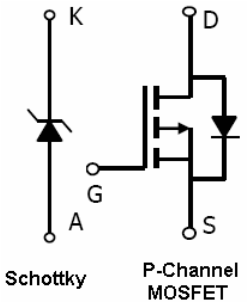
- Battery Powered System
- DC/DC Converter
- Load Switch
- Cell Phone

FEATURES

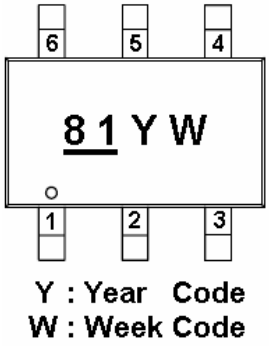
- P-Channel
  -30V/-2.8A,RDS(ON)=105mΩ@VGS=- 10V
  -30V/-2.5A,RDS(ON)=115mΩ@VGS=-4.5V
  -30V/-1.5A,RDS(ON)=150mΩ@VGS=-2.5V
- Schottky
  VKA (V) = 20V, IF = 1A, VF<0.5V@0.5A
- Super high density cell design for extremely low RDS (ON)
- Exceptional on-resistance and maximum DC current capability
- TSOP–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

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

ABSOULTE MAXIMUM RATINGS
(T_A=25℃ 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℃)	T_A=25℃	I_D	-2.8		A
	T_A=70℃		-2.1		
Pulsed Drain Current		I_{DM}	-10		A
Schottky Reverse Voltage		V_{KA}		20	V
Continuous Forward Current	T_A=25℃	I_F		1	A
	T_A=70℃			0.7	
Pulsed Forward Current		I_{FM}		10	A
Continuous Source Current(Diode Conduction)		I_S	-1.4		A
Power Dissipation	T_A=25℃	P_D	1.15	0.9	W
	T_A=70℃		0.75	0.6	
Operating Junction Temperature		T_J	-55/150		℃
Storage Temperature Range		T_{STG}	-55/150		℃
Thermal Resistance-Junction to Ambient	T ≤ 10sec	$R_{\theta JA}$	52		℃/W
	Steady State		90		

SPC6801

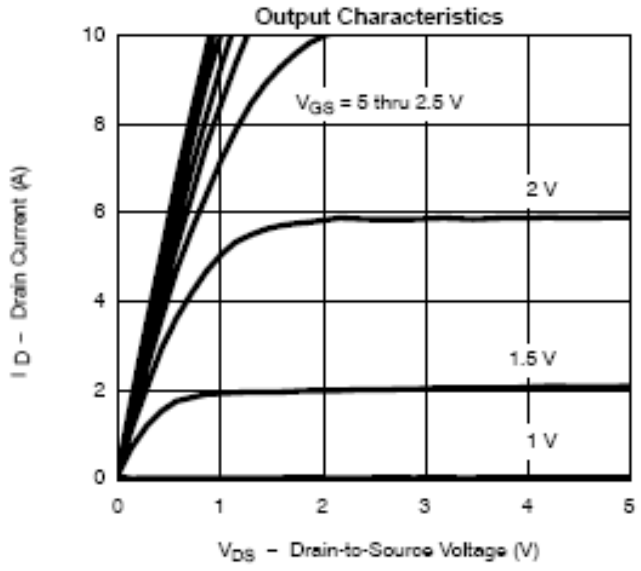
P-Channel Trench MOSFET with Schottky Diode

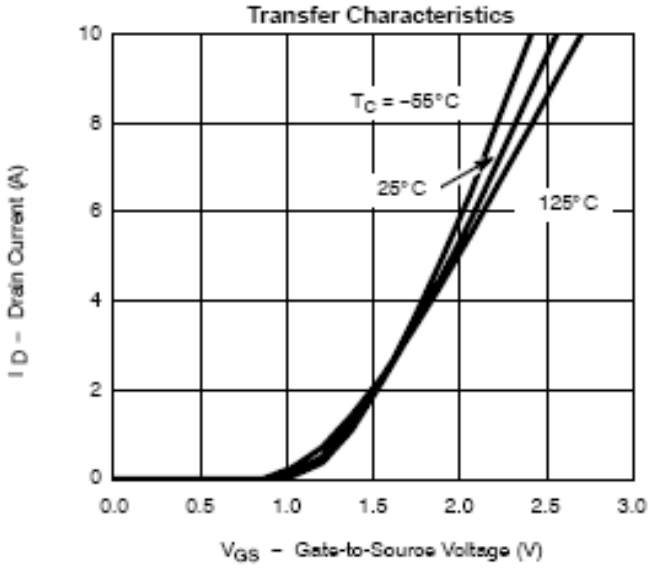
ELECTRICAL CHARACTERISTICS

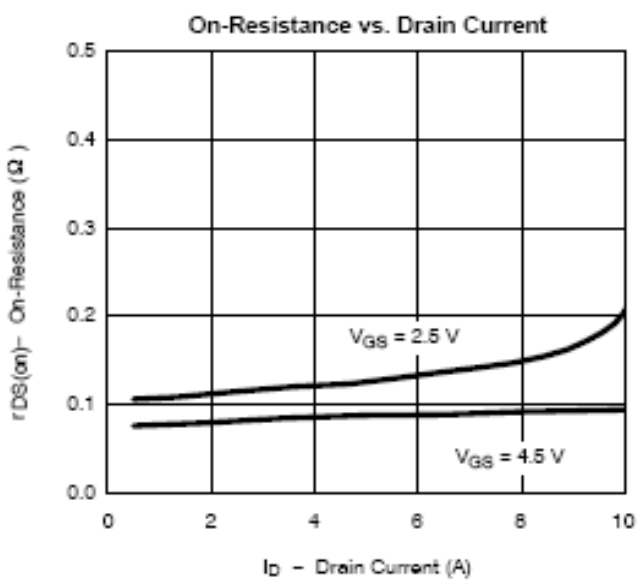
(T_A=25℃ Unless otherwise noted)

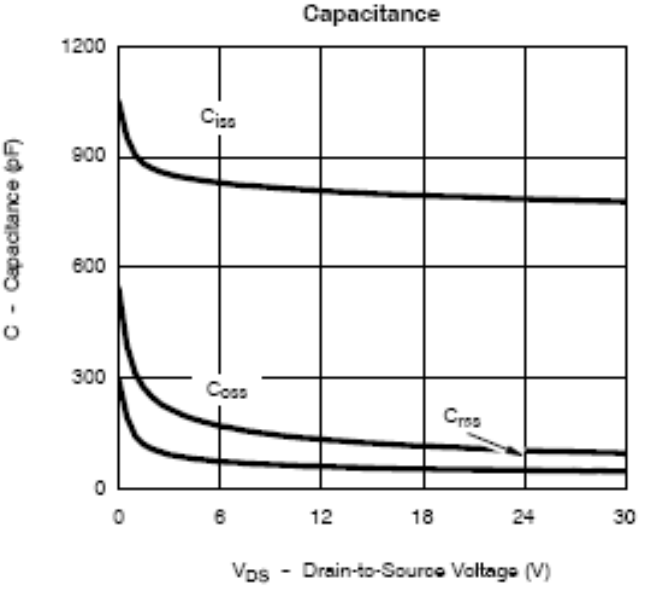
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
MOSFET Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-10uA	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250uA	-0.4		-1.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V,V_{GS}=0V			-1	uA
		V_{DS}=-24V,V_{GS}=0V T_J=55℃			-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	gfs	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=1MHz		380		pF
Output Capacitance	C_{oss}			55		
Reverse Transfer Capacitance	C_{rss}			40		
Turn-On Time	$t_{d(on)}$	V_{DD}=-15V ,R_L=15Ω I_D≡-1.0A ,V_{GEN}=-10V R_G=3Ω		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 = 500mA		0.41	0.47	V
Reverse Breakdown Voltage	V_{BR}	I_R = 500uA	20			V
Maximum reverse leakage current	Irm	V_R = 20V			0.1	mA
		V_R = 20V , T_J=70℃			1	
Junction Capacitance	C_T	V_R = 10V		31		pF
		V_R = 0V , f=1MHz		120		
SchottkyReverse Recovery Time	T_{rr}	I_F=1A, dI/dt=100A/μs		5.4	10	ns
Schottky Reverse Recovery Charge	Q_{rr}	I_F=1A, dI/dt=100A/μs		0.8		nC

TYPICAL CHARACTERISTICS (P-Channel MOSFET)









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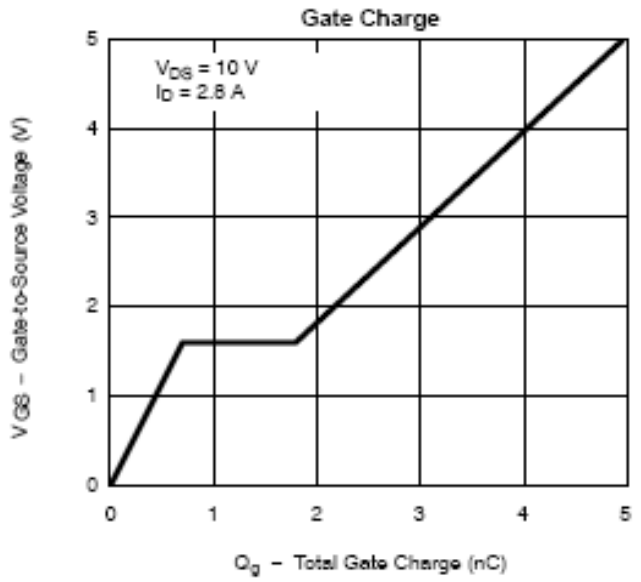
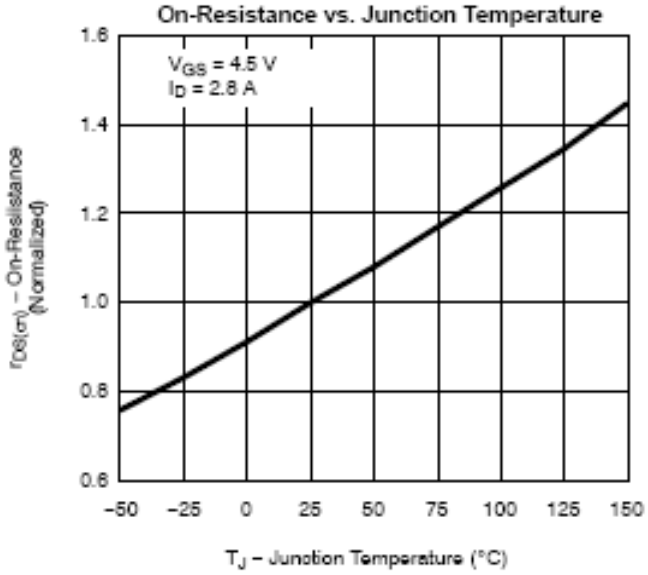
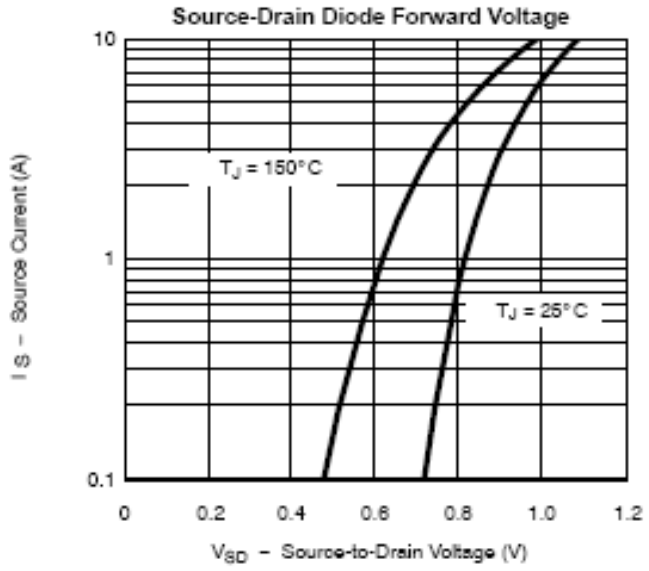
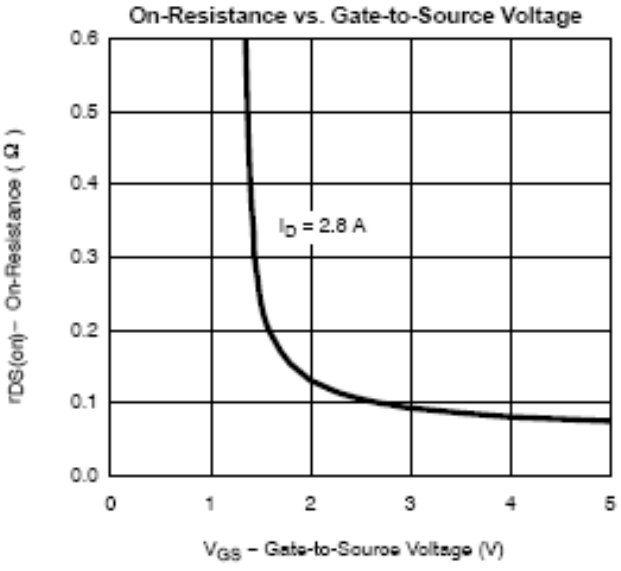
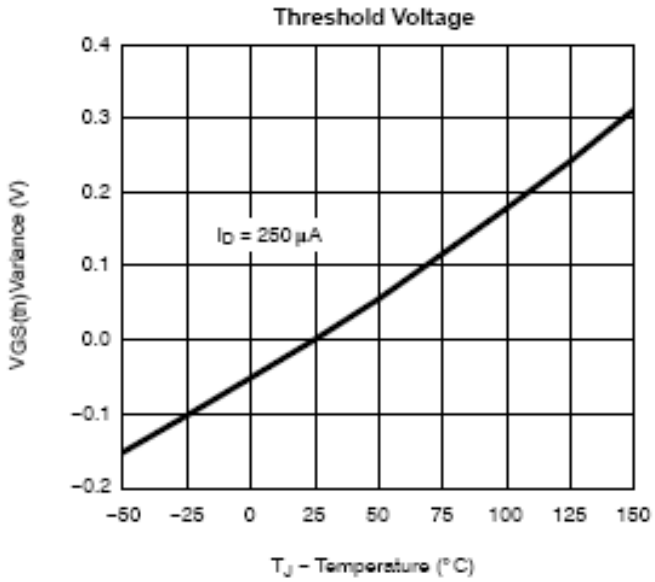


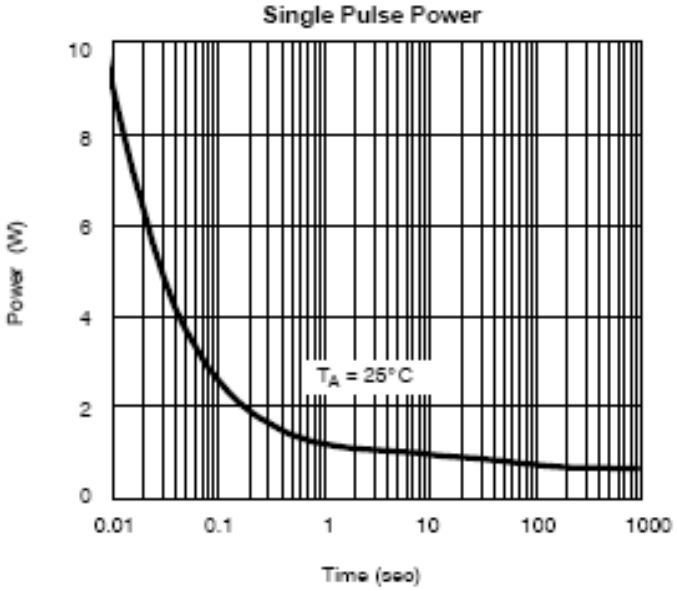


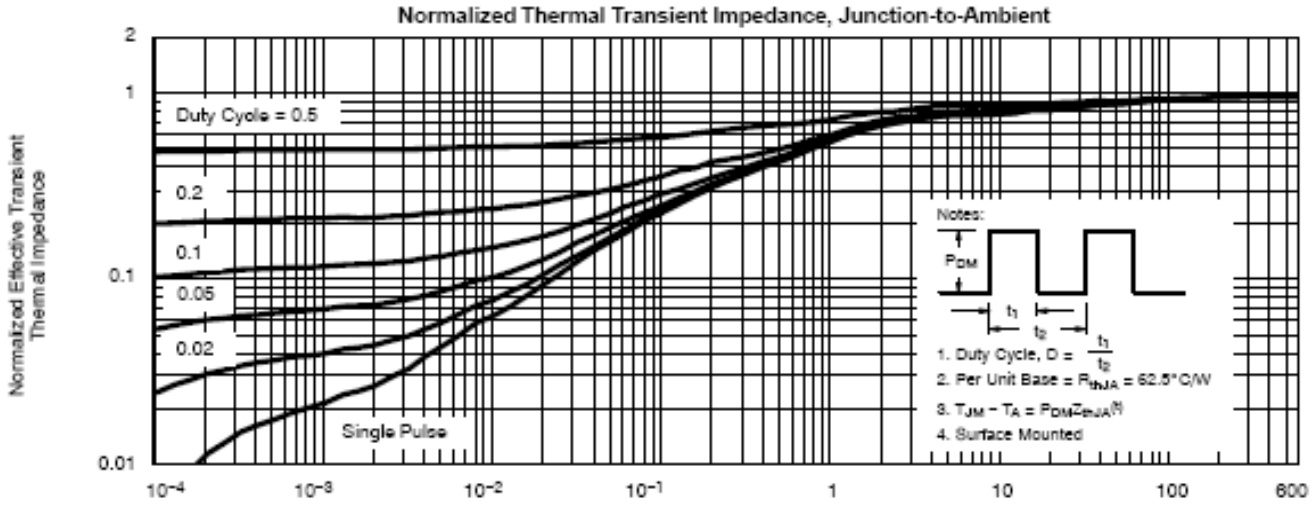




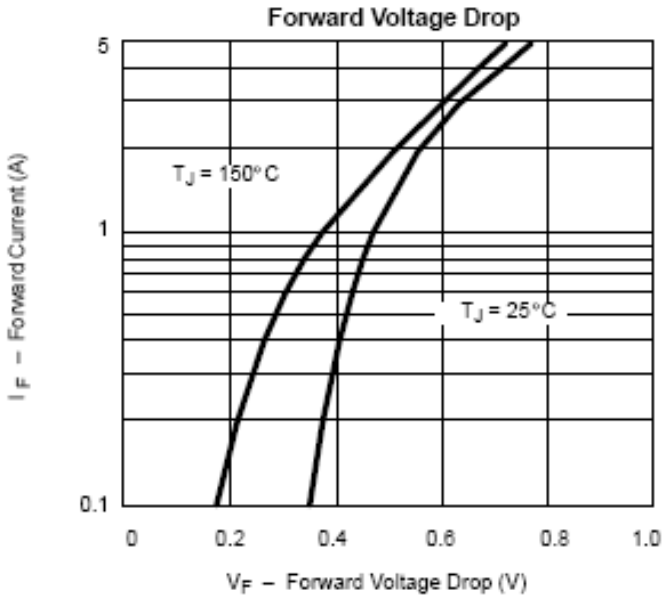
TYPICAL CHARACTERISTICS (P-Channel MOSFET)

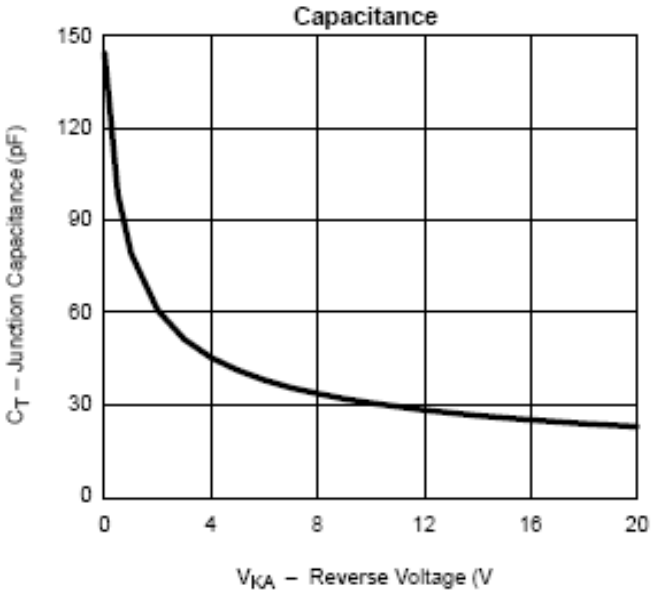


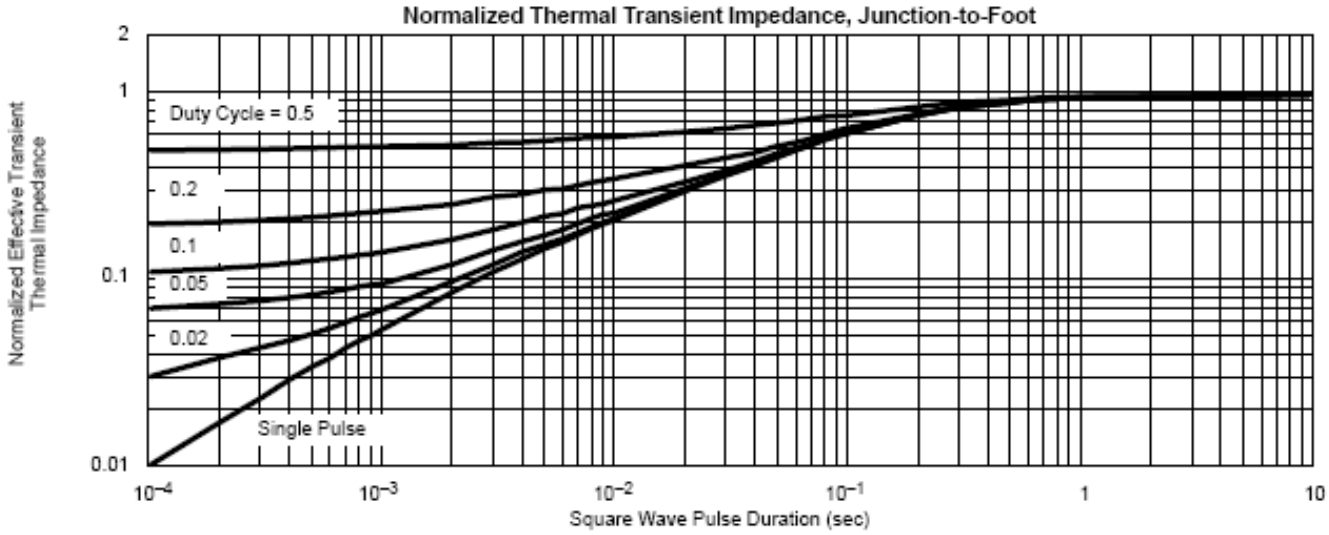




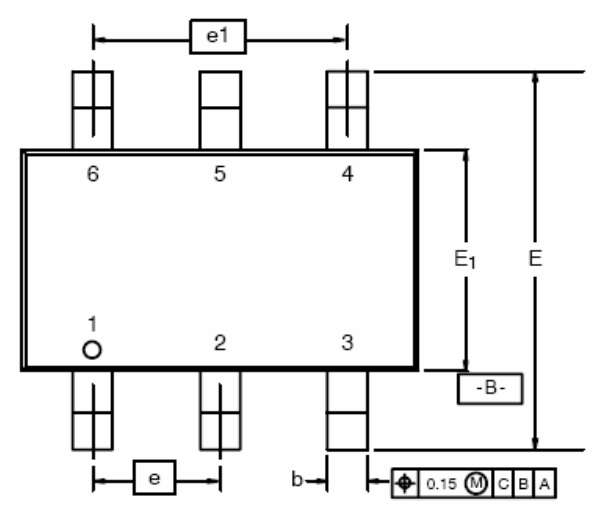
TYPICAL CHARACTERISTICS (Schottky)

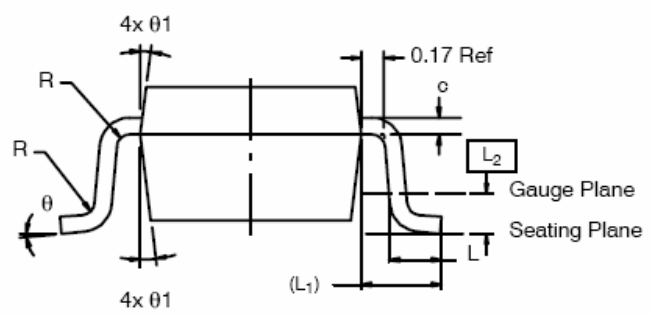






TSOP- 6P PACKAGE OUTLINE





Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	-	1.10	0.036	-	0.043
A_1	0.01	-	0.10	0.0004	-	0.004
A_2	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
E_1	1.55	1.65	1.70	0.061	0.065	0.067
e	1.00 BSC			0.0394 BSC		
e_1	1.90	2.00	2.10	0.075	0.080	0.085
L	0.35	-	0.50	0.014	-	0.020
L_1	0.60 Ref			0.024 Ref		
L_2	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
$θ_1$	7° Nom			7° Nom		

SYNC Power Corporation
9F-5, No.3-2, Park Street
NanKang District (NKSP), Taipei, Taiwan 115
Phone: 886-2-2655-8178
Fax: 886-2-2655-8468
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