



SPC6604

N & P Pair Enhancement Mode MOSFET

DESCRIPTION

The SPC6604 is the N- and 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. These devices are particularly suited for low voltage applications such as notebook computer power management and other battery powered circuits where high-side switching , low in-line power loss, and resistance to transients are needed.

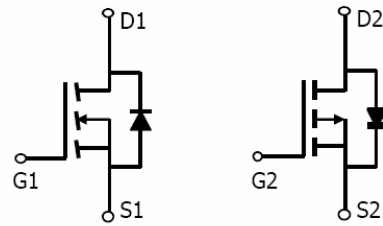
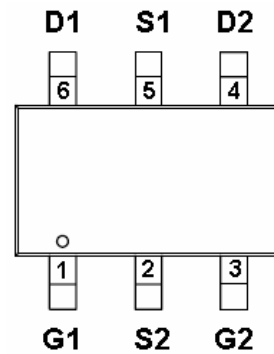
FEATURES

- ◆ N-Channel
 - 20V/4.0A, $R_{DS(ON)}=50m\Omega@V_{GS}=4.5V$
 - 20V/3.4A, $R_{DS(ON)}=60m\Omega@V_{GS}=2.5V$
 - 20V/2.8A, $R_{DS(ON)}=75m\Omega@V_{GS}=1.8V$
 - 20V/1.0A, $R_{DS(ON)}=120m\Omega@V_{GS}=1.25V$
- ◆ P-Channel
 - 20V/-3.4A, $R_{DS(ON)}=85m\Omega@V_{GS}=-4.5V$
 - 20V/-2.4A, $R_{DS(ON)}=110m\Omega@V_{GS}=-2.5V$
 - 20V/-1.7A, $R_{DS(ON)}=130m\Omega@V_{GS}=-1.8V$
 - 20V/-1.0A, $R_{DS(ON)}=200m\Omega@V_{GS}=-1.25V$
- ◆ Super high density cell design for extremely low RDS (ON)
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TSOP- 6P package design

APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

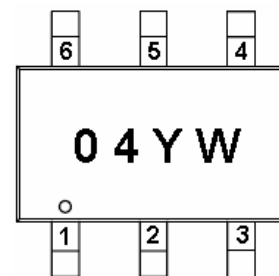
PIN CONFIGURATION(TSOP- 6P)



n-channel

p-channel

PART MARKING



Y : Year Code
W : Week Code



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PIN DESCRIPTION

Pin	Symbol	Description
1	G1	Gate 1
2	S2	Source 2
3	G2	Gate 2
4	D2	Drain 2
5	S1	Source 1
6	D1	Drain1

ORDERING INFORMATION

Part Number	Package	Part Marking
SPC6604ST6RG	TSOP- 6P	04YW

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

※ SPC6604ST6RG : Tape Reel ; Pb – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	V _{DSS}	20	-20	V	
Gate –Source Voltage	V _{GSS}	±12	±12	V	
Continuous Drain Current(T _J =150°C)	TA=25°C	4.0	-2.8	A	
	TA=70°C	3.4	-2.1		
Pulsed Drain Current	I _{DM}	10	-8	A	
Continuous Source Current(Diode Conduction)	I _S	1.6	-1.4	A	
Power Dissipation	P _D	1.15		W	
		0.75			
Operating Junction Temperature	T _J	-55/150		°C	
Storage Temperature Range	T _{STG}	-55/150		°C	
Thermal Resistance-Junction to Ambient	R _{θJA}	T ≤ 10sec	50	52	°C/W
		Steady State	90	90	



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ELECTRICAL CHARACTERISTICS

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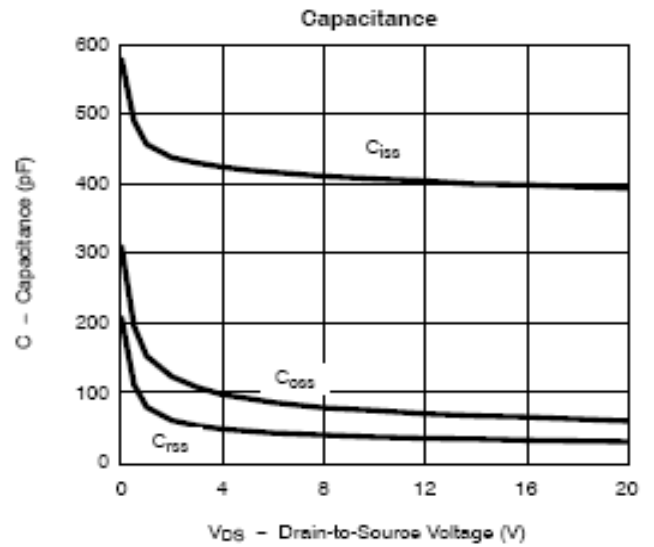
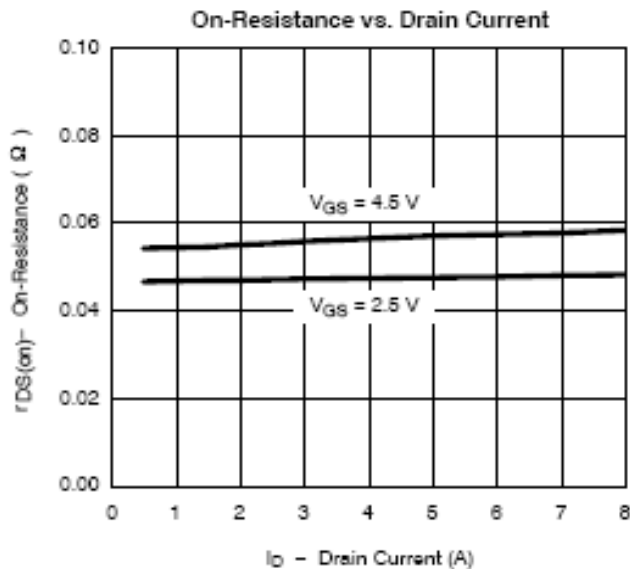
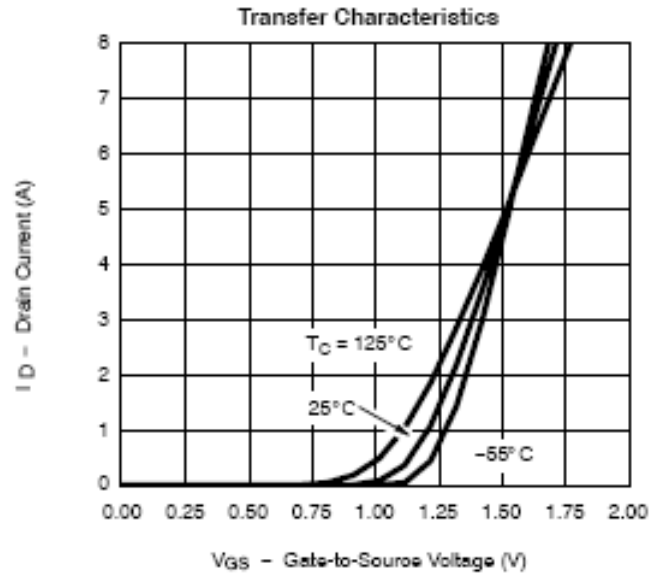
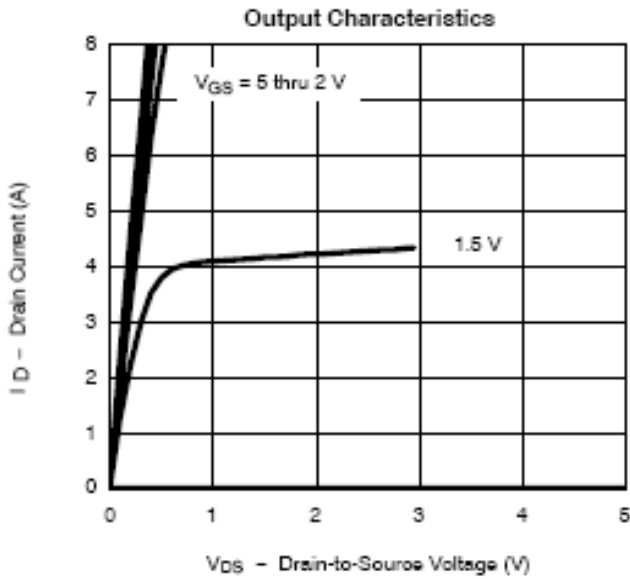
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D = 250uA	N-Ch	20		V	
		V _{GS} =0V, I _D =-250uA	P-Ch	-20			
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	N-Ch	0.4	1.0		
		V _{DS} =V _{GS} , I _D =-250uA	P-Ch	-0.35	-0.8		
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	N-Ch		±100	nA	
		V _{DS} =0V, V _{GS} =±12V	P-Ch		±100		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20V, V _{GS} =0V	N-Ch		1	uA	
		V _{DS} =-20V, V _{GS} =0V	P-Ch		-1		
		V _{DS} = 20V, V _{GS} =0V T _J =55°C	N-Ch		10		
		V _{DS} =-20V, V _{GS} =0V T _J =55°C	P-Ch		-10		
On-State Drain Current	I _{D(on)}	V _{DS} ≥ 4.5V, V _{GS} = 10V	N-Ch	6		A	
		V _{DS} ≤ -4.5V, V _{GS} =-10V	P-Ch	-6			
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =4.0A	N-Ch		0.040	0.050	Ω
		V _{GS} =-4.5V, I _D =-3.4A	P-Ch		0.068	0.085	
		V _{GS} =2.5V, I _D =3.4A	N-Ch		0.046	0.060	
		V _{GS} =-2.5V, I _D =-2.4A	P-Ch		0.090	0.110	
		V _{GS} =1.8V, I _D =2.8A	N-Ch		0.056	0.075	
		V _{GS} =-1.8V, I _D =-1.7A	P-Ch		0.113	0.130	
		V _{GS} =1.25V, I _D =1.0A	N-Ch		0.105	0.120	
		V _{GS} =-1.25V, I _D =-1.0A	P-Ch		0.185	0.200	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =-3.6A	N-Ch		10	S	
		V _{DS} =-5V, I _D =-2.8A	P-Ch		6		
Diode Forward Voltage	V _{SD}	I _S =1.6A, V _{GS} =0V	N-Ch		0.8	1.2	V
		I _S =-1.5A, V _{GS} =0V	P-Ch		-0.8	-1.2	
Dynamic							
Total Gate Charge	Q _g	N-Channel V _{DS} =6V, V _{GS} =4.5V, I _D =2.8A P-Channel V _{DS} =-6V, V _{GS} =-4.5V, I _D =-2.8A	N-Ch		4.8	8	nC
			P-Ch		4.8	8	
Gate-Source Charge	Q _{gs}		N-Ch		1.0		
			P-Ch		1.0		
Gate-Drain Charge	Q _{gd}		N-Ch		1.0		
			P-Ch		1.0		
Turn-On Time	t _{d(on)}	N-Channel V _{DD} =6V, R _L =6Ω, I _D =1.0A V _{GEN} =4.5V, R _G =6Ω P-Channel V _{DD} =-6V, R _L =6Ω, I _D =-1.0A V _{GEN} =-4.5V, R _G =6Ω	N-Ch		8	14	nS
			P-Ch		10	16	
	t _r		N-Ch		12	18	
			P-Ch		13	23	
Turn-Off Time	t _{d(off)}		N-Ch		30	35	
			P-Ch		18	25	
	t _f		N-Ch		12	16	
			P-Ch		15	20	



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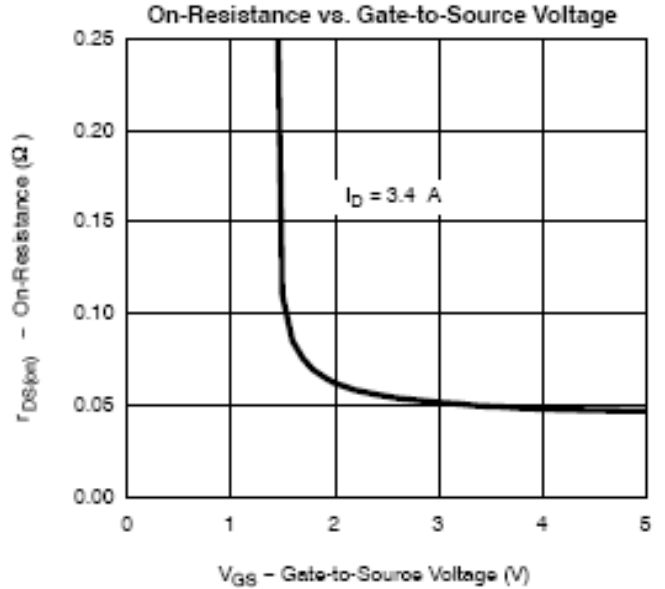
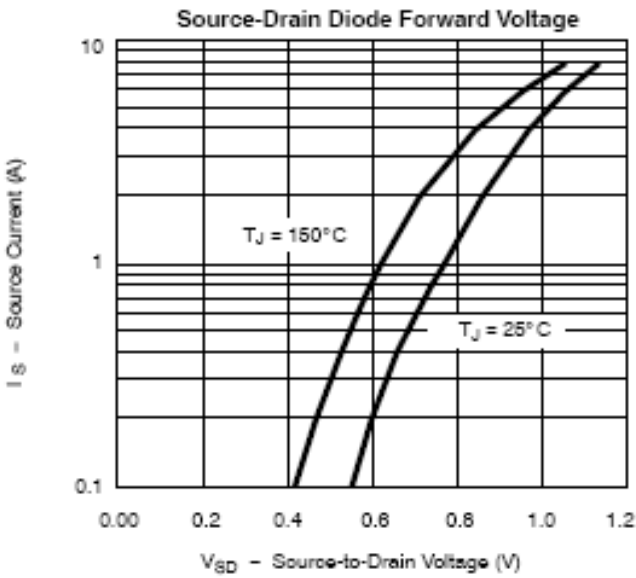
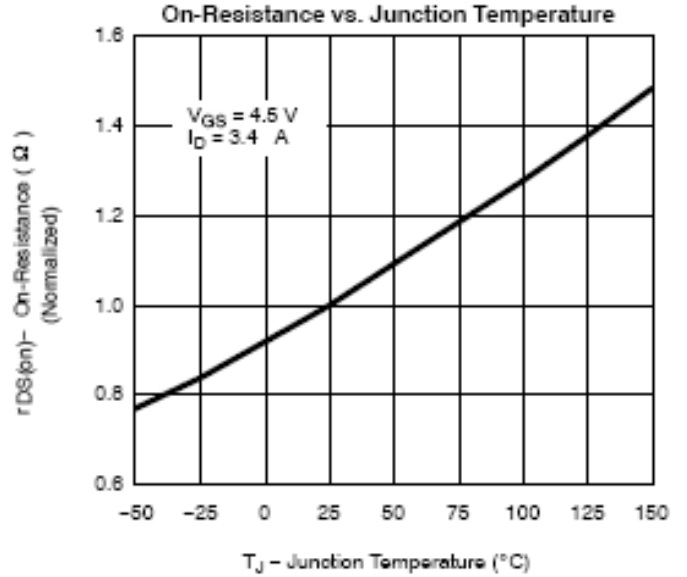
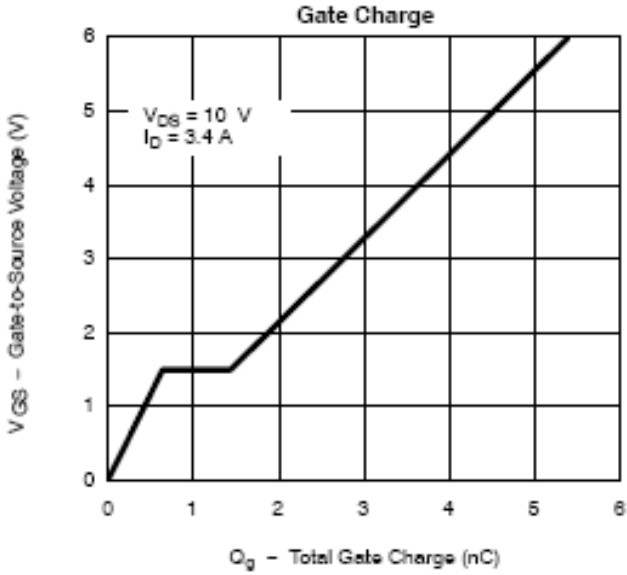
TYPICAL CHARACTERISTICS (N-Channel)





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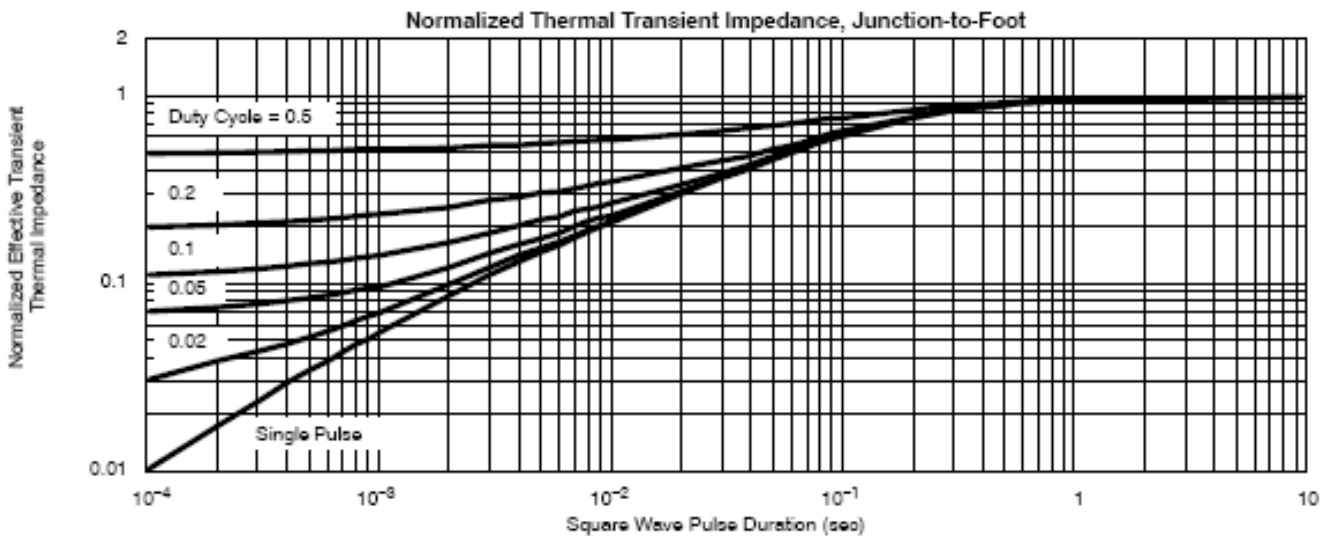
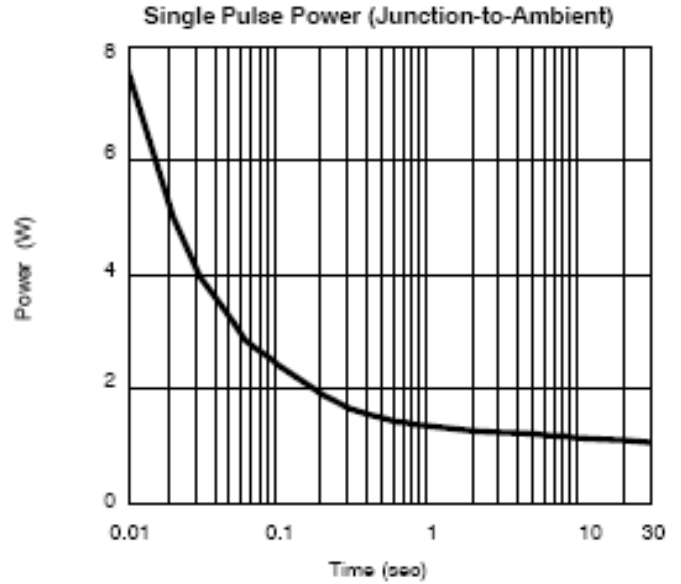
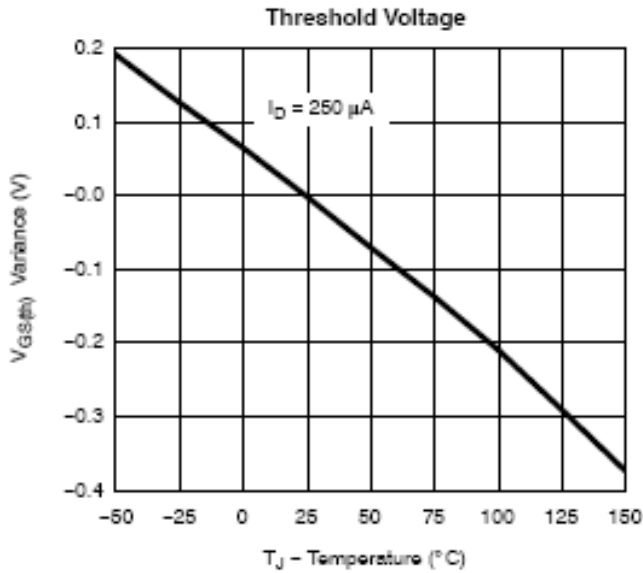
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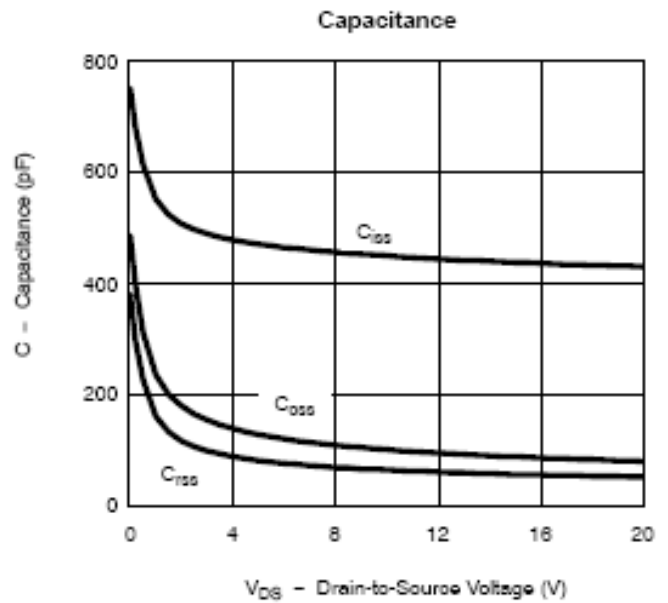
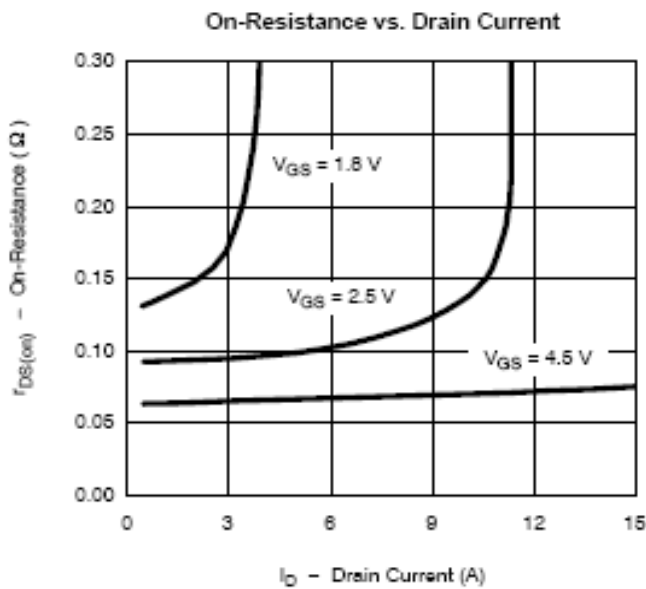
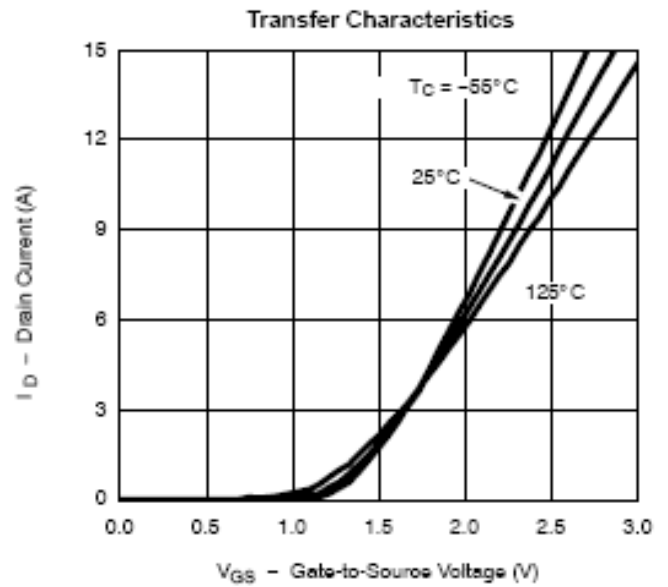
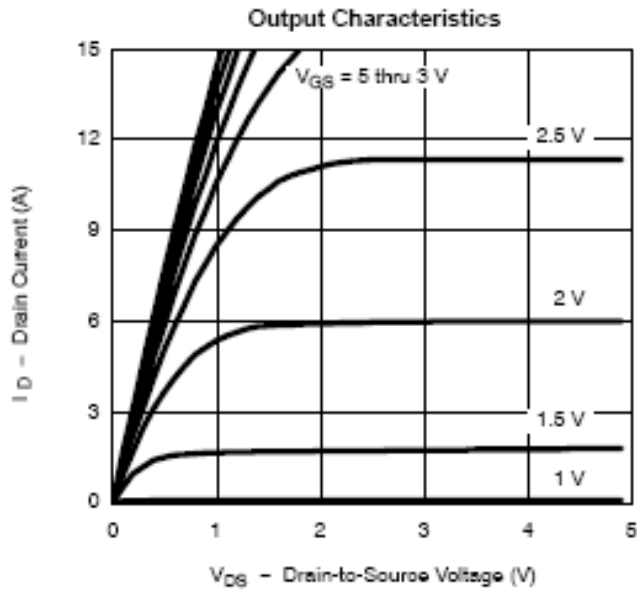
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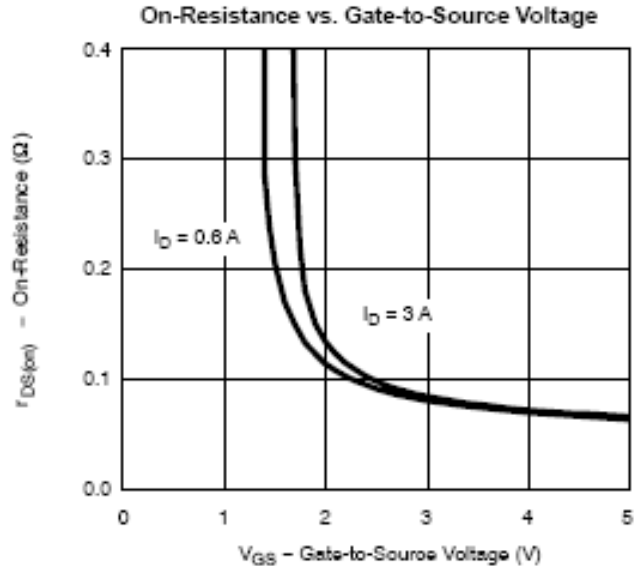
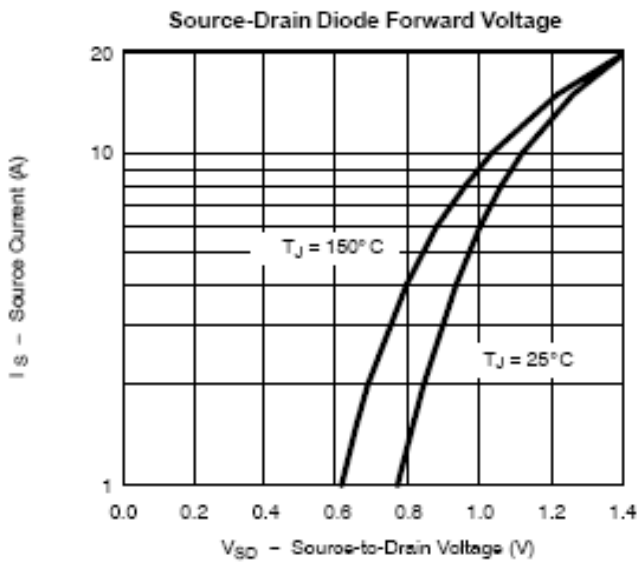
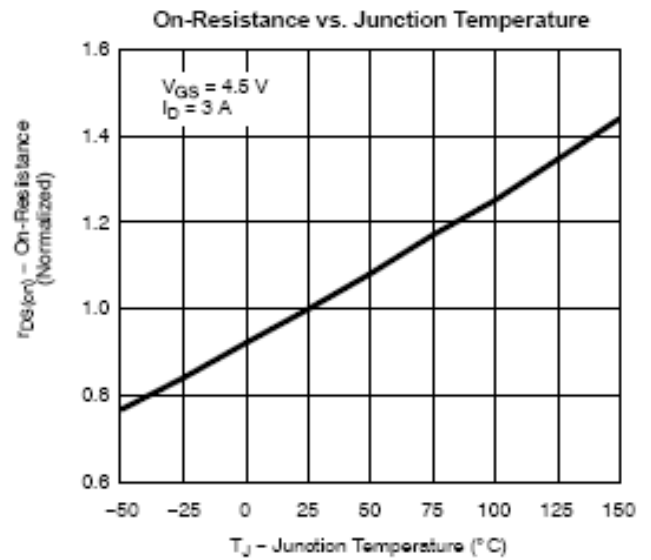
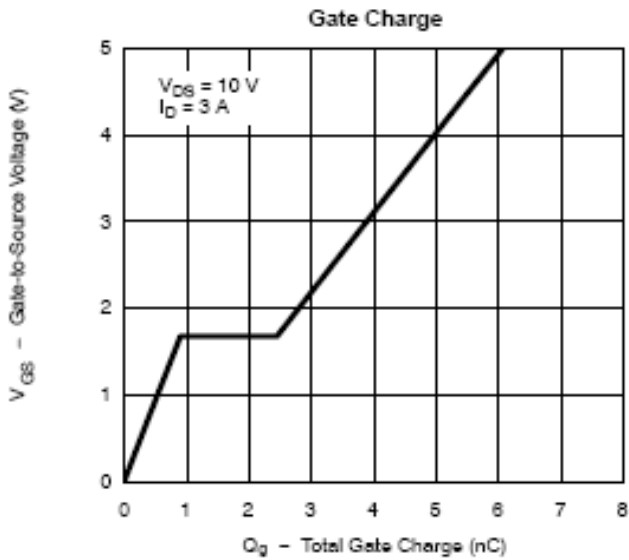
TYPICAL CHARACTERISTICS (P-Channel)





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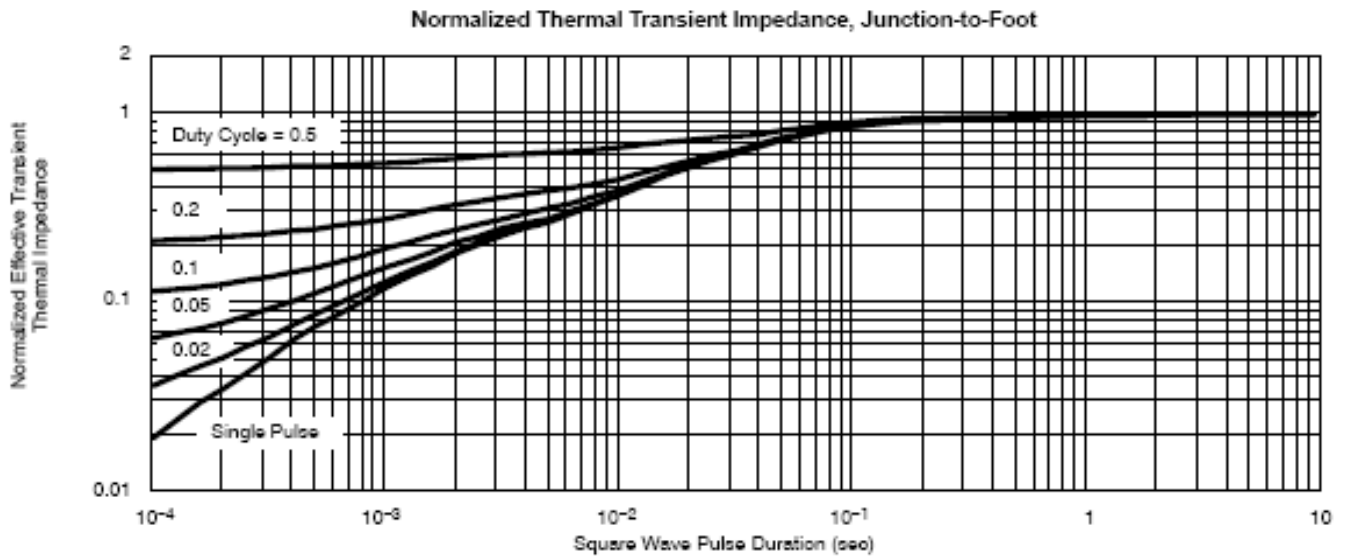
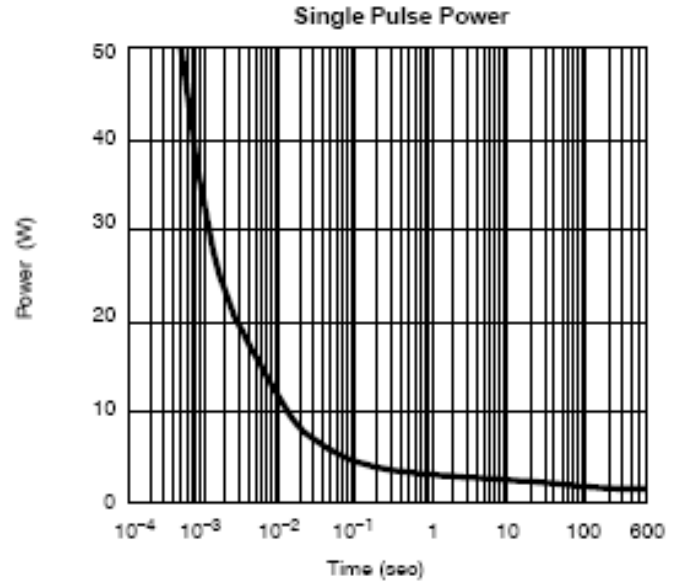
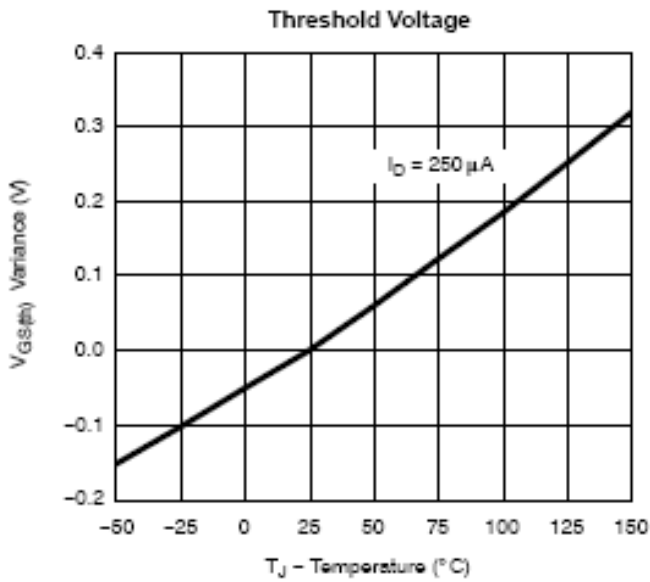
TYPICAL CHARACTERISTICS (P-Channel)





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TYPICAL CHARACTERISTICS (P-Channel)

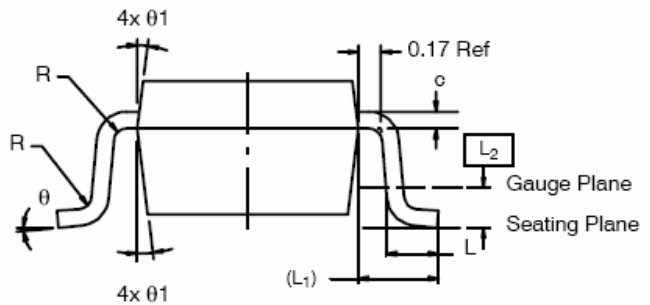
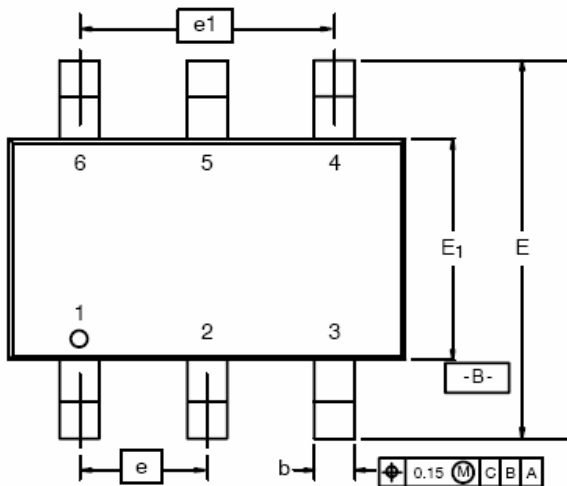




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TSOP- 6P PACKAGE OUTLINE



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	2.65	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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