



# SPC1016

## N & P Pair Enhancement Mode MOSFET

### DESCRIPTION

The SPC1016 is the Dual 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.

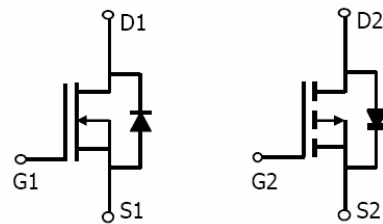
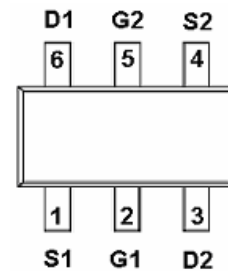
### APPLICATIONS

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

### FEATURES

- ◆ N-Channel
  - 20V/0.65A,  $R_{DS(ON)}=380m\Omega@V_{GS}=4.5V$
  - 20V/0.55A,  $R_{DS(ON)}=450m\Omega@V_{GS}=2.5V$
  - 20V/0.45A,  $R_{DS(ON)}=800m\Omega@V_{GS}=1.8V$
- ◆ P-Channel
  - 20V/0.45A,  $R_{DS(ON)}=0.52\Omega@V_{GS}=-4.5V$
  - 20V/0.35A,  $R_{DS(ON)}=0.70\Omega@V_{GS}=-2.5V$
  - 20V/0.25A,  $R_{DS(ON)}=0.95\Omega@V_{GS}=-1.8V$
- ◆ Super high density cell design for extremely low RDS (ON)
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOT-563 (SC-89-6L) package design

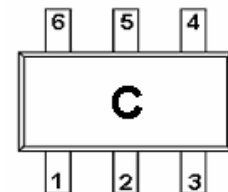
### PIN CONFIGURATION( SOT-563 / SC-89-6L)



n-channel

p-channel

### PART MARKING





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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
SPC1016S36RG	SOT-563	C

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

※ SPC1016S56RG : Tape Reel ; Pb – Free

### ABSOLUTE MAXIMUM RATINGS

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

Parameter	Symbol	Typical		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	$V_{DSS}$	20	-20	V	
Gate –Source Voltage	$V_{GSS}$	$\pm 12$	$\pm 12$	V	
Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$I_D$	$T_A=25^{\circ}\text{C}$	0.65	-0.45	A
		$T_A=80^{\circ}\text{C}$	0.45	-0.35	
Pulsed Drain Current	$I_{DM}$	1.0	-1.0	A	
Continuous Source Current(Diode Conduction)	$I_S$	0.3	-0.3	A	
Power Dissipation	$P_D$	$T_A=25^{\circ}\text{C}$	0.35		W
		$T_A=70^{\circ}\text{C}$	0.19		
Operating Junction Temperature	$T_J$	-55/150		$^{\circ}\text{C}$	
Storage Temperature Range	$T_{STG}$	-55/150		$^{\circ}\text{C}$	



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### ELECTRICAL CHARACTERISTICS

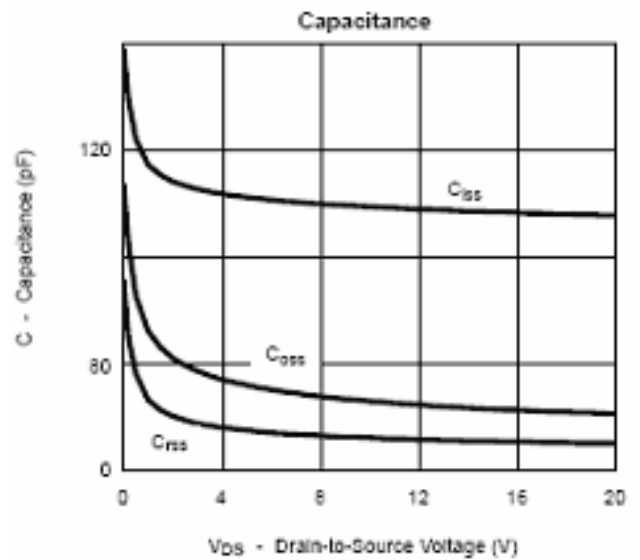
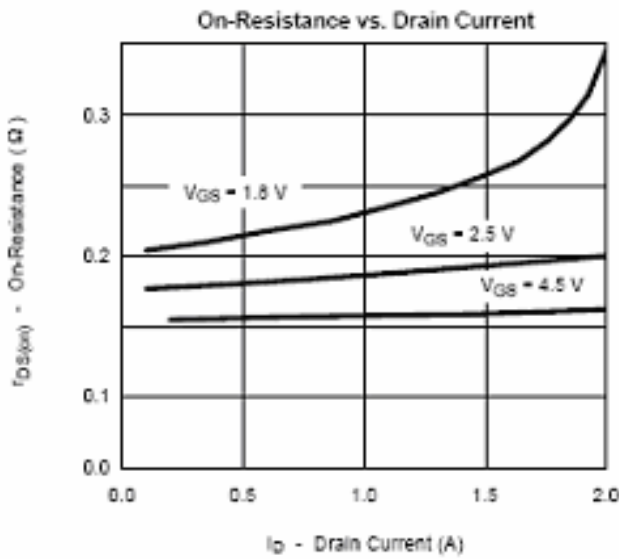
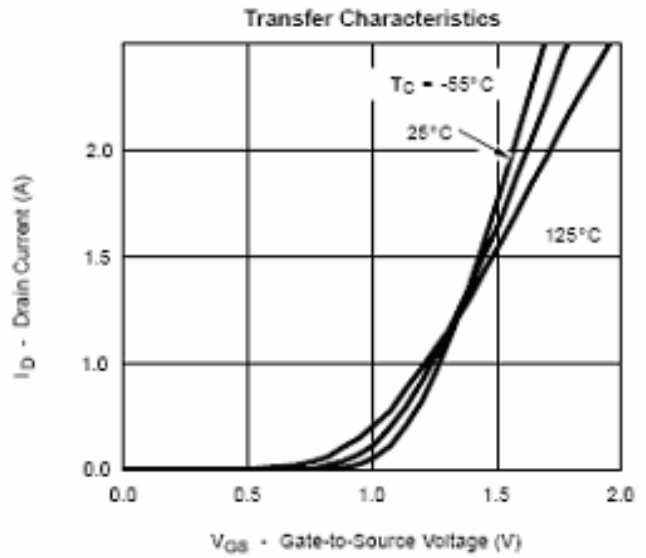
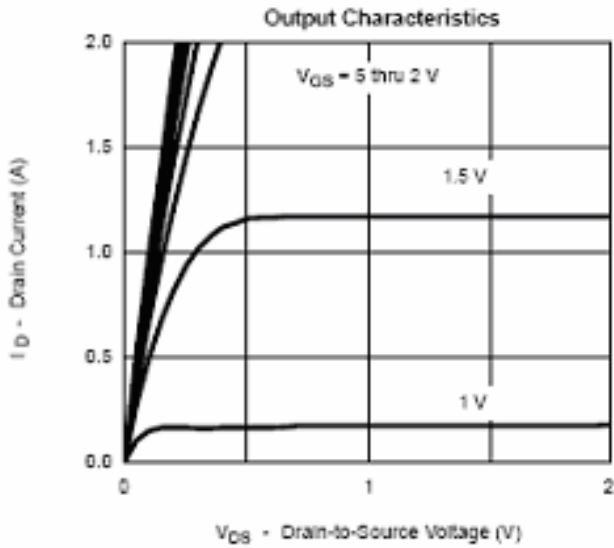
(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> = 250uA	N-Ch	20		V
		V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	P-Ch	-20		
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	N-Ch	0.35	1.0	
		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	P-Ch	-0.35	-0.8	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V	N-Ch		±100	nA
		V <sub>DS</sub> =0V, V <sub>GS</sub> =±12V	P-Ch		±100	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 20V, V <sub>GS</sub> =0V	N-Ch		1	uA
		V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V	P-Ch		-1	
		V <sub>DS</sub> = 20V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C	N-Ch		10	
		V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V T <sub>J</sub> =55°C	P-Ch		-10	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 4.5V, V <sub>GS</sub> = 5V	N-Ch	0.7		A
		V <sub>DS</sub> ≤ -4.5V, V <sub>GS</sub> = -5V	P-Ch	-0.7		
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.65A	N-Ch		0.26 0.38	Ω
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.45A	P-Ch		0.42 0.52	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.55A	N-Ch		0.32 0.45	
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-0.35A	P-Ch		0.58 0.70	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.45A	N-Ch		0.42 0.80	
		V <sub>GS</sub> =-1.8V, I <sub>D</sub> =-0.25A	P-Ch		0.75 0.95	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.4A	N-Ch	1.0		S
		V <sub>DS</sub> =-10V, I <sub>D</sub> =-0.25A	P-Ch	0.4		
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 0.15A, V <sub>GS</sub> =0V	N-Ch	0.8	1.2	V
		I <sub>S</sub> =-0.15A, V <sub>GS</sub> =0V	P-Ch	-0.8	-1.2	
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	N-Channel V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.6A P-Channel V <sub>DS</sub> =-10V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-0.6A	N-Ch		1.2 1.5	nC
Gate-Source Charge	Q <sub>gs</sub>		P-Ch		1.5 2.0	
			N-Ch		0.2	
Gate-Drain Charge	Q <sub>gd</sub>		P-Ch		0.3	
			N-Ch		0.3	
Turn-On Time	td(on)		N-Channel		5 10	
	tr	P-Ch		5 10		
Turn-Off Time		td(off)	N-Channel		8 15	
	P-Ch			15 25		
	tf	N-Channel		10 18		
		P-Ch		8 15		
		N-Channel		1.2 2.8		
		P-Ch		1.4 1.8		



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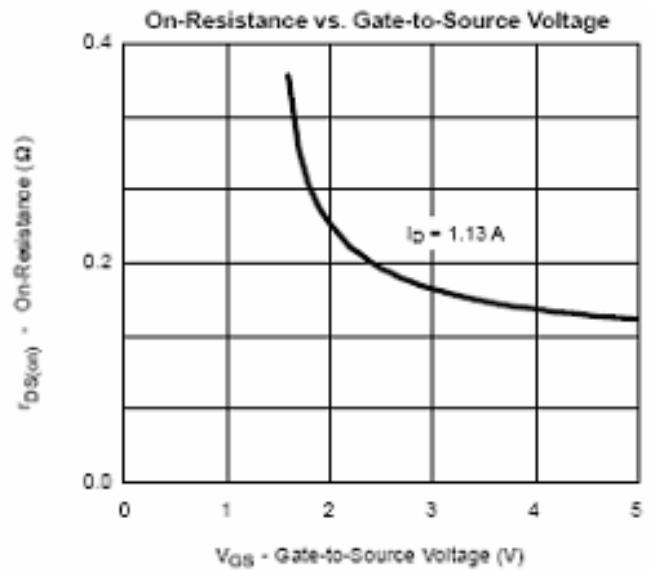
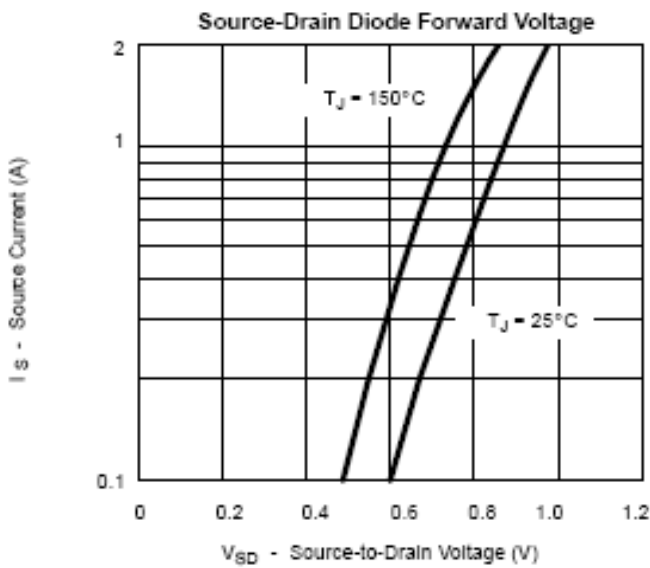
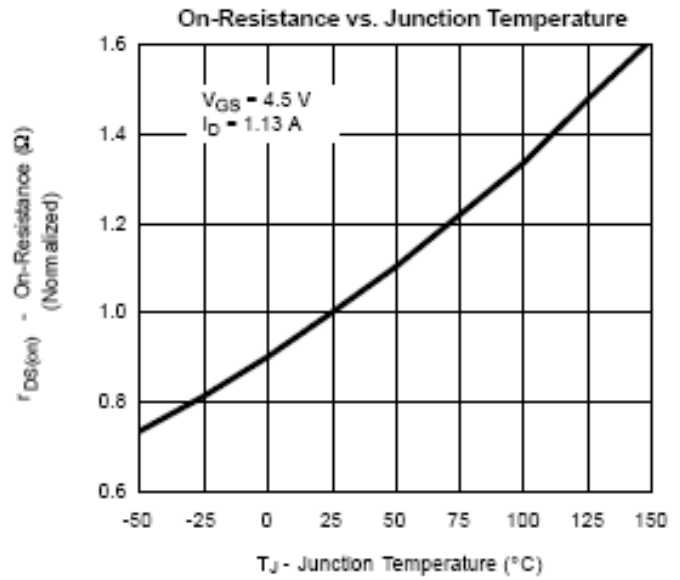
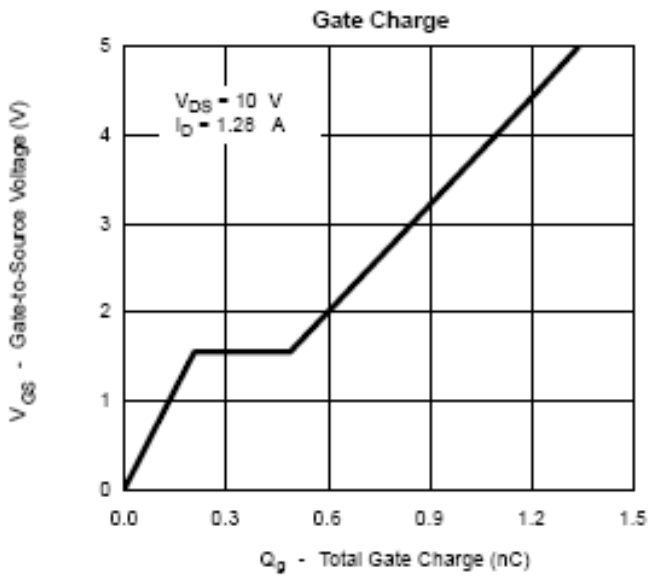
## TYPICAL CHARACTERISTICS ( N-Channel )





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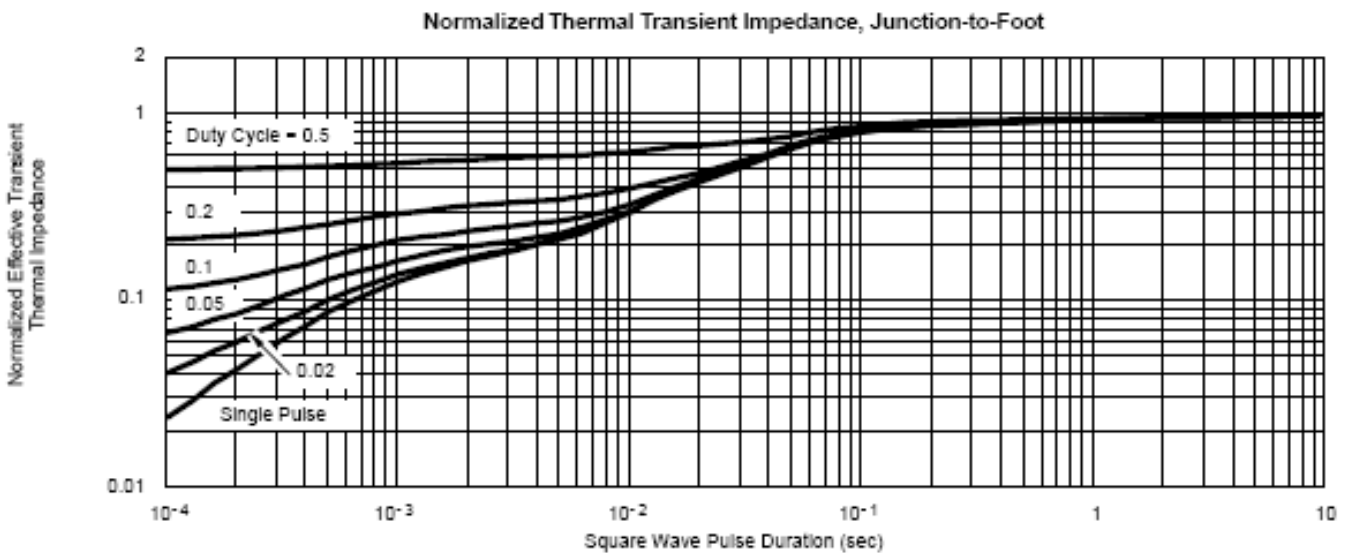
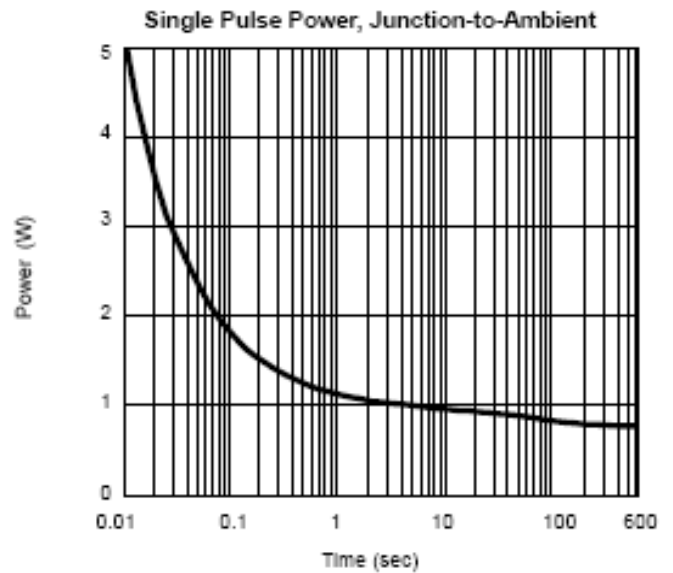
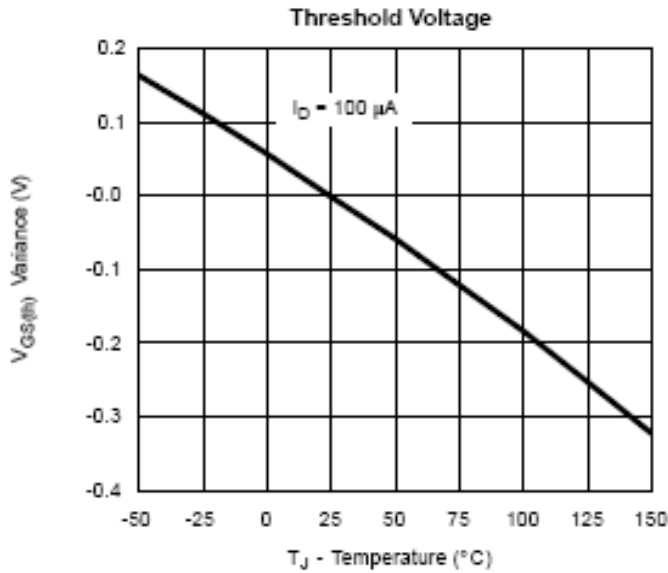
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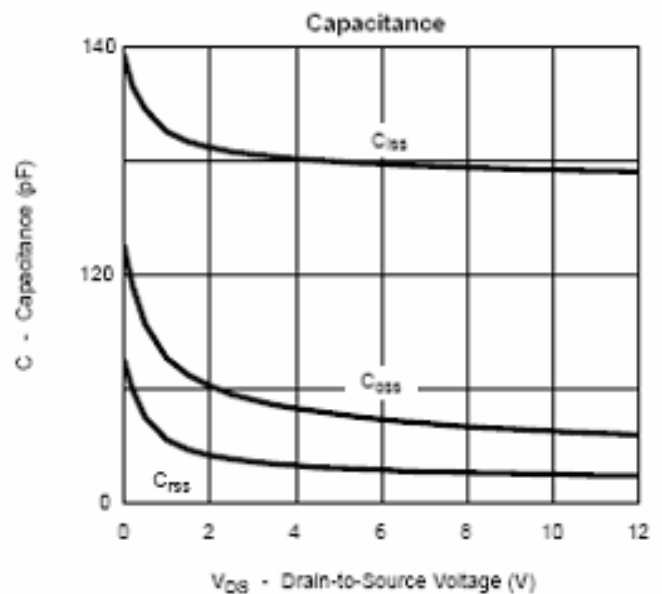
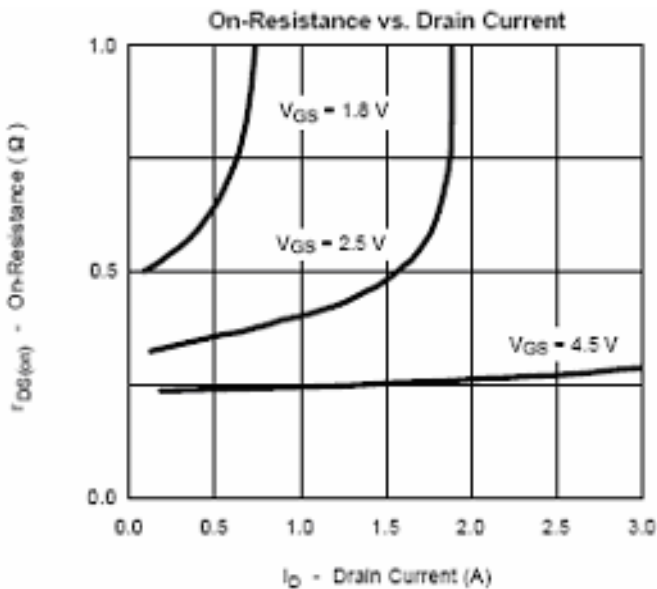
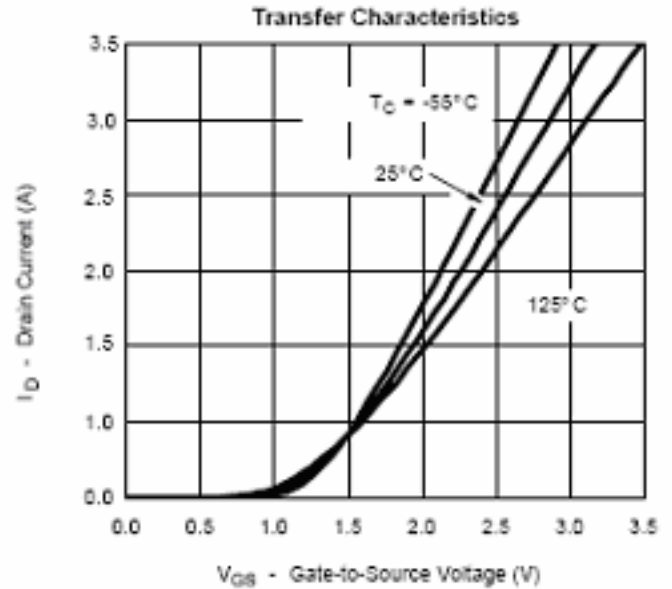
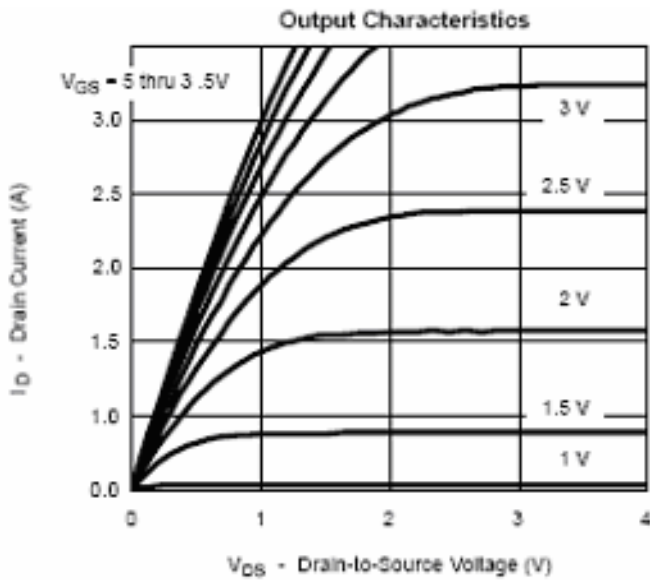
## TYPICAL CHARACTERISTICS ( N-Channel )





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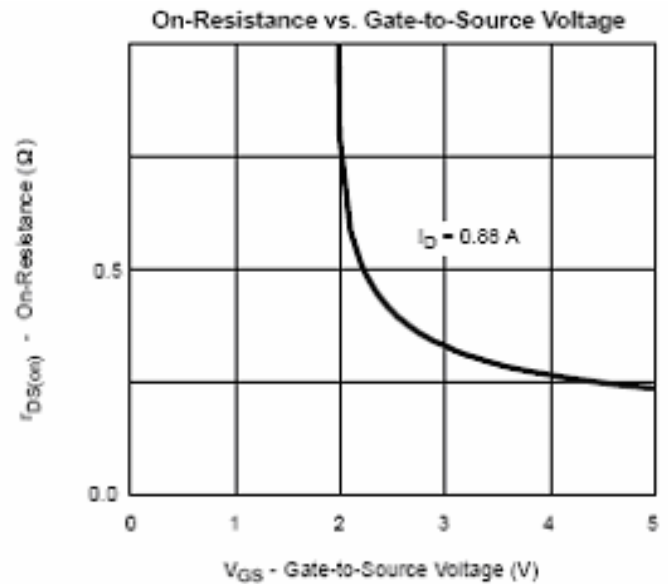
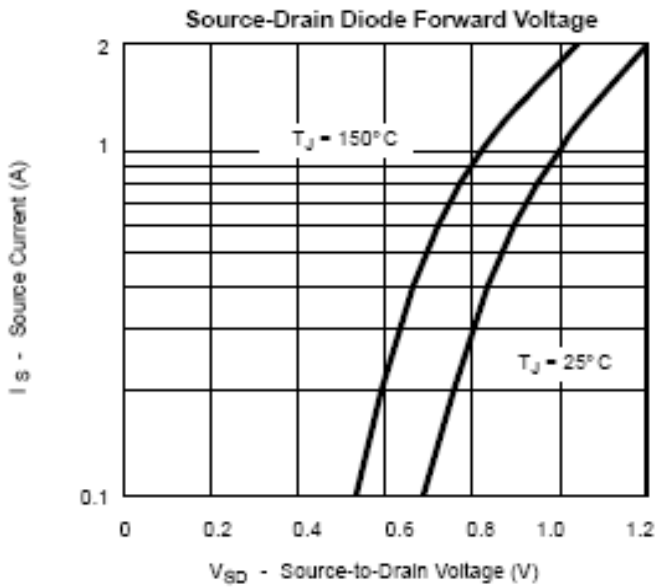
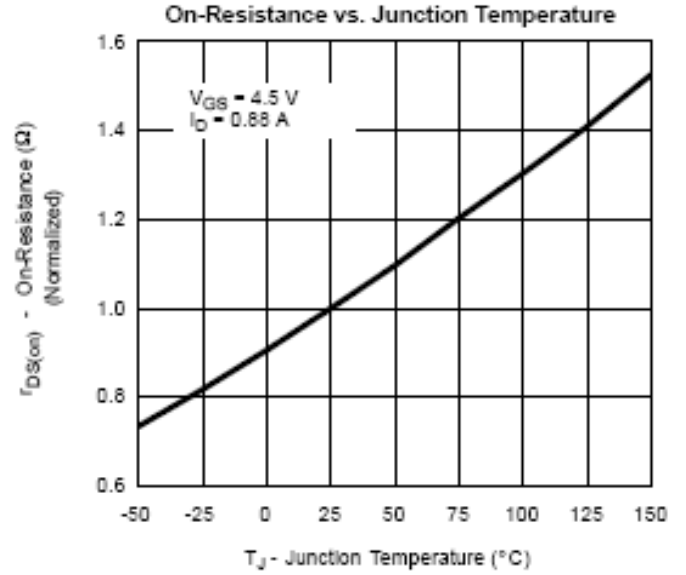
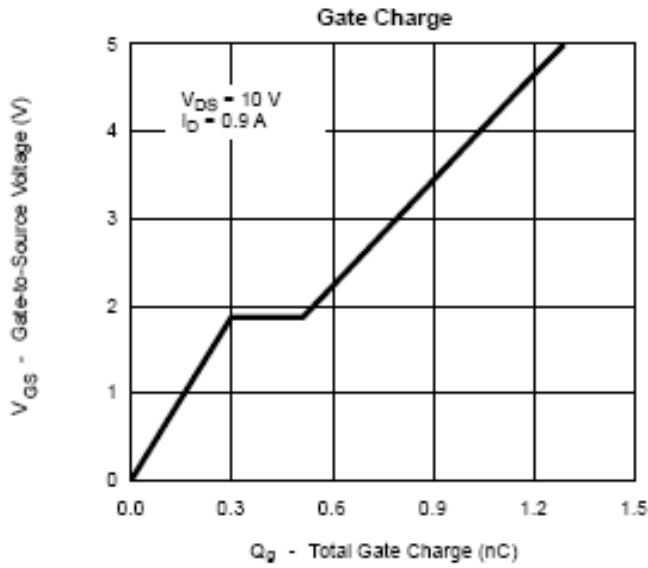
## TYPICAL CHARACTERISTICS ( P-Channel )





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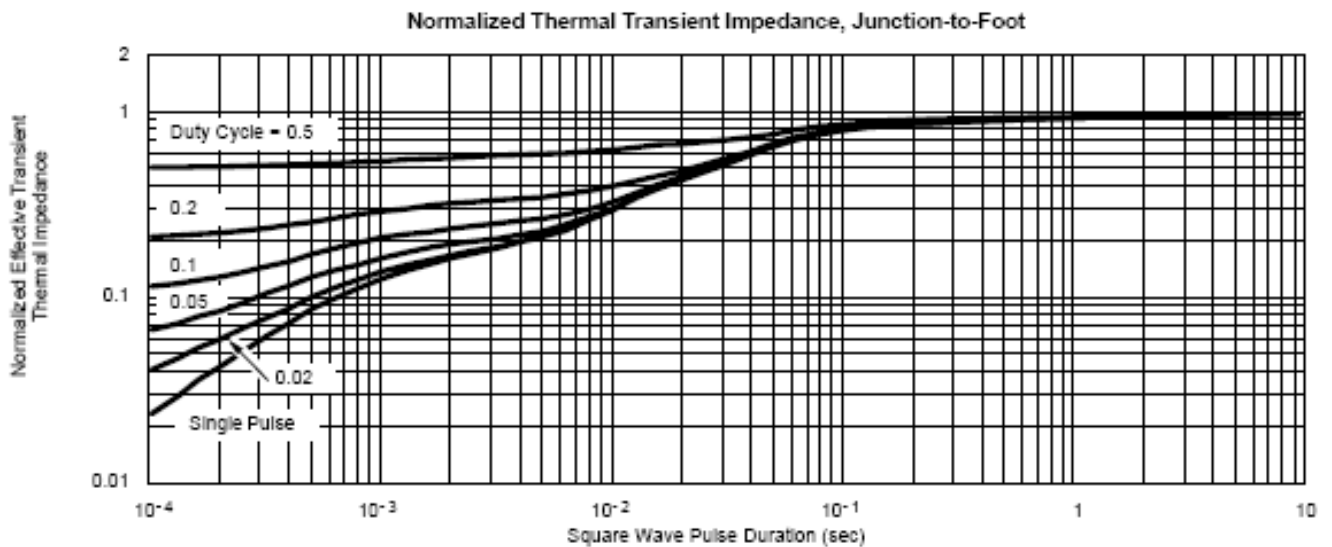
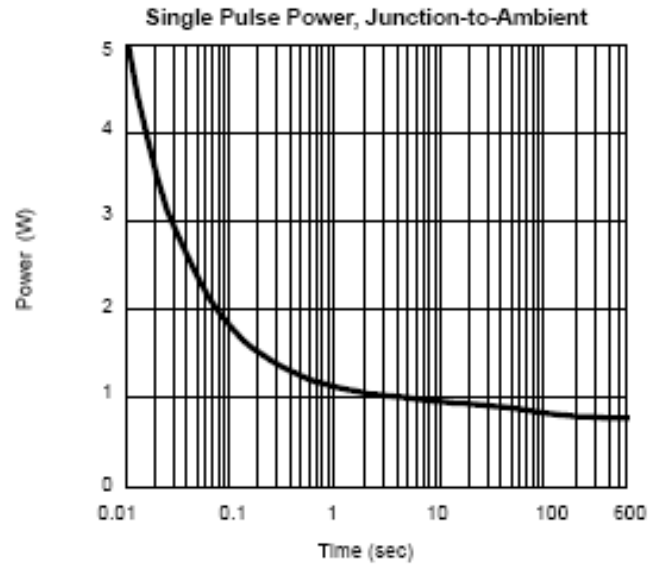
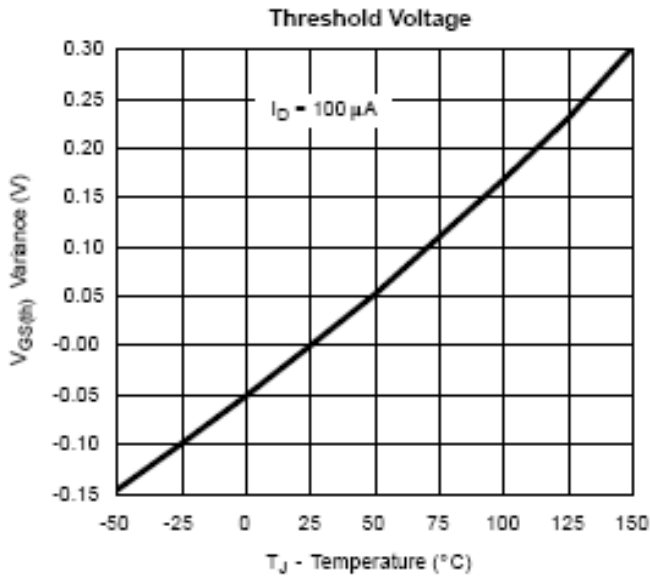
## TYPICAL CHARACTERISTICS ( P-Channel )





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## TYPICAL CHARACTERISTICS ( P-Channel )

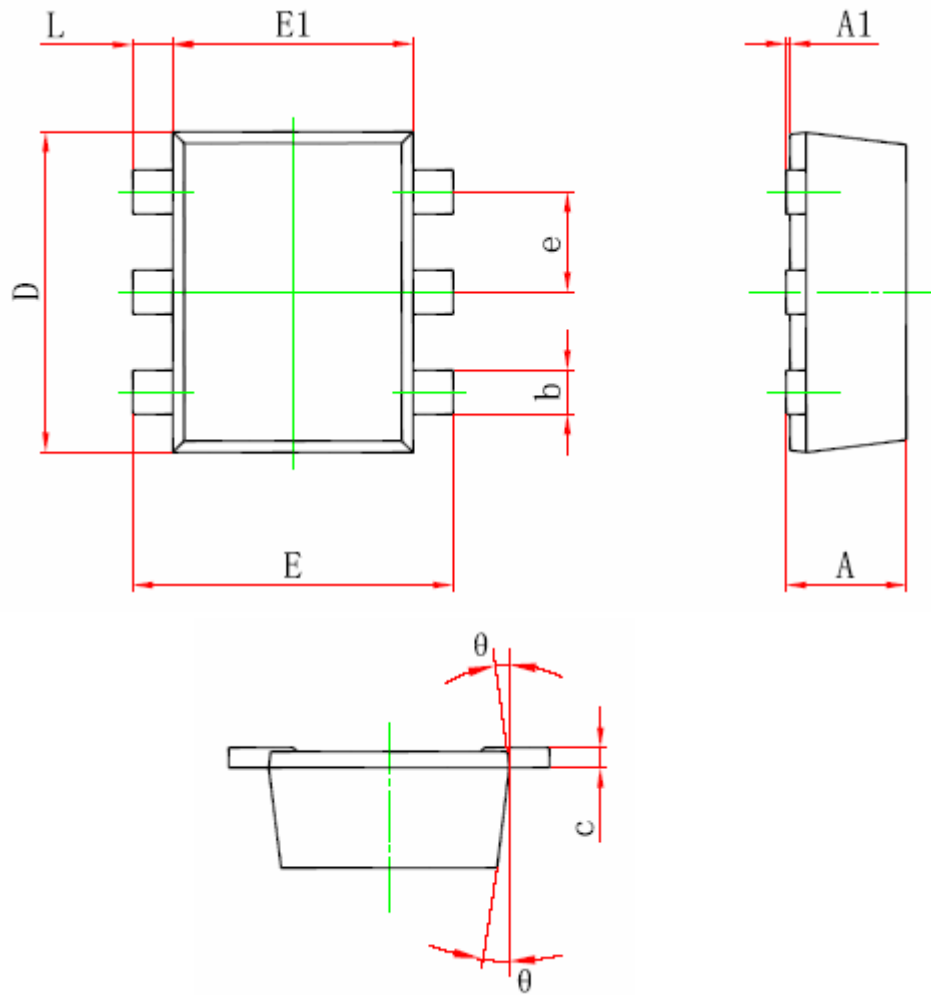




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### SOT-563 PACKAGE OUTLINE



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	0.525	0.600	0.021	0.024
A1	0.000	0.050	0.000	0.002
e	0.450	0.550	0.018	0.022
c	0.090	0.160	0.004	0.006
D	1.500	1.700	0.059	0.067
b	0.170	0.270	0.007	0.011
E1	1.100	1.300	0.043	0.051
E	1.500	1.700	0.059	0.067
L	0.100	0.300	0.004	0.012
θ	7° REF.		7° REF.	



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