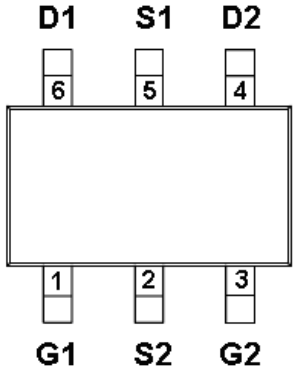
SPC6604
N & P Pair Enhancement Mode MOSFET

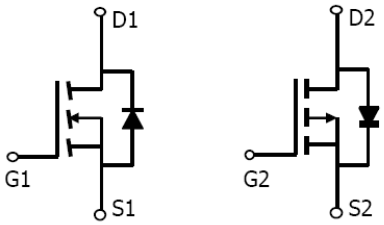
DESCRIPTION
The SPC6604 is the N- and P-Channel enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology. This high density process is especially tailored to minimize on-state resistance and provide superior switching performance. These devices are 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.

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

FEATURES
- N-Channel
  20V/4.0A,$R_{DS(ON)}$=50mΩ@V_{GS}=4.5V
  20V/3.4A,$R_{DS(ON)}$=60mΩ@V_{GS}=2.5V
  20V/2.8A,$R_{DS(ON)}$=75mΩ@V_{GS}=1.8V
- P-Channel
  -20V/-3.4A,$R_{DS(ON)}$= 85mΩ@V_{GS}=-4.5V
  -20V/-2.4A,$R_{DS(ON)}$=110mΩ@V_{GS}=-2.5V
  -20V/-1.7A,$R_{DS(ON)}$=130mΩ@V_{GS}=-1.8V
- Super high density cell design for extremely low RDS (ON)
- Exceptional on-resistance and maximum DC current capability
- TSOT–23- 6P package design

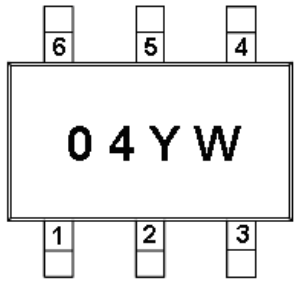
PIN CONFIGURATION(TSOT-23– 6P)





n-channel p-channel

PART MARKING



Y : Year Code
W : Week Code

SPC6604
N & P Pair Enhancement Mode MOSFET

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
SPC6604TS26RGB	TSOT-23- 6P	04YW

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

※ SPC6604TS26RGB : Tape Reel ; Pb – Free ; Halogen -Free

ABSOULTE MAXIMUM RATINGS

(T_A=25℃ 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℃)	T_A=25℃	ID	3.4	-2.8	A
	T_A=70℃		2.4	-2.1	
Pulsed Drain Current		I_{DM}	10	-8	A
Continuous Source Current(Diode Conduction)		I_S	1.6	-1.4	A
Power Dissipation	T_A=25℃	P_D	1.15		W
	T_A=70℃		0.75		
Operating Junction Temperature		T_J	-55/150		℃
Storage Temperature Range		T_{STG}	-55/150		℃
Thermal Resistance-Junction to Ambient	T ≤ 10sec	$R_{\theta JA}$	50	52	℃/W
	Steady State		90	90	
Thermal Resistance-Junction to Lead	Steady State	$R_{\theta JL}$	42	44	

ELECTRICAL CHARACTERISTICS

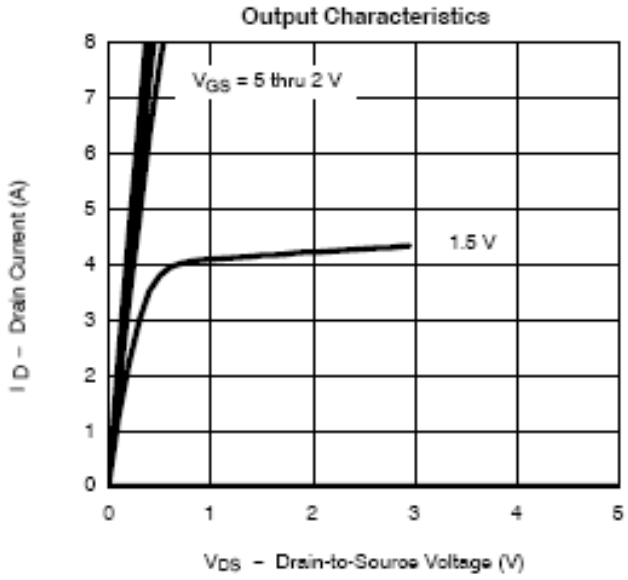
(T_A=25℃ Unless otherwise noted)

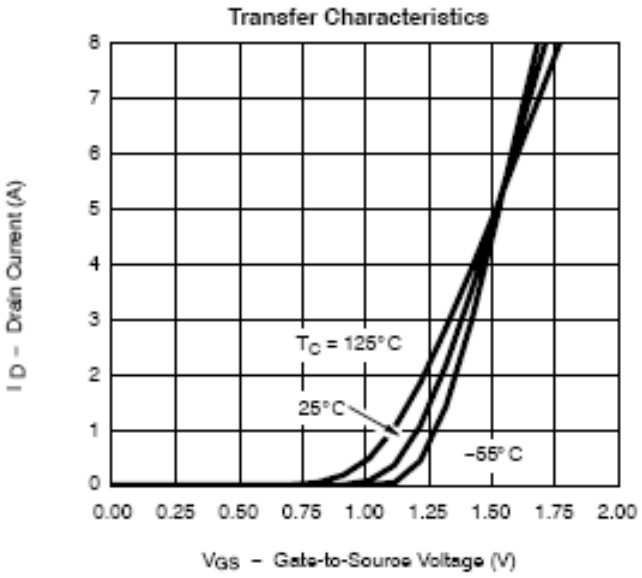
Parameter	Symbol	Conditions		Min.	Typ	Max.	Unit
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D= 250uA	N-Ch	20			V
		V_{GS}=0V,I_D=-250uA	P-Ch	-20			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	N-Ch	0.4		1.0	
		V_{DS}=V_{GS},I_D=-250uA	P-Ch	-0.35		-0.8	
Gate Leakage 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}= 16V,V_{GS}=0V	N-Ch			1	uA
		V_{DS}=-16V,V_{GS}=0V	P-Ch			-1	
		V_{DS}= 16V,V_{GS}=0V T_J=55℃	N-Ch			10	
		V_{DS}=-16V,V_{GS}=0V T_J=55℃	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	
Forward Transconductance	gfs	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	

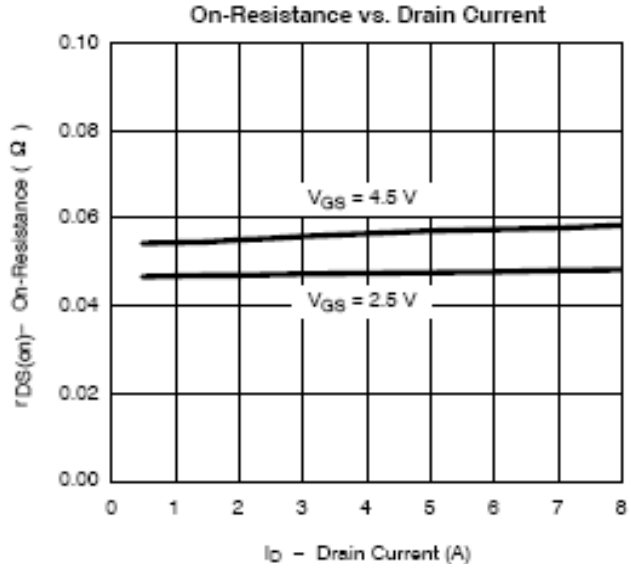
Dynamic

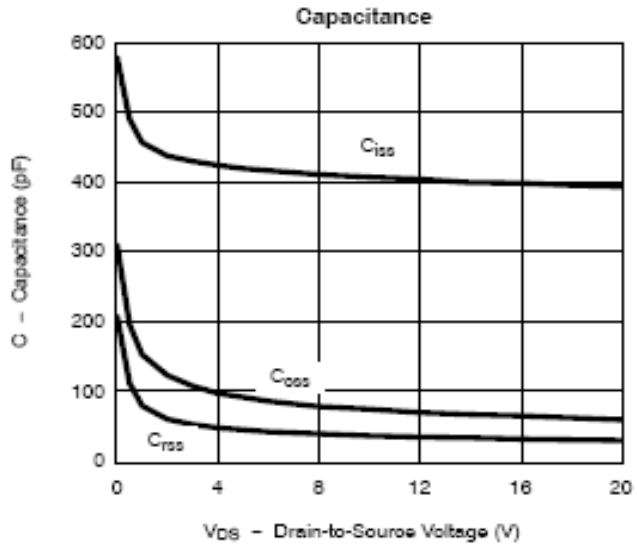
Total Gate Charge	Q_g	N-Channel V_{DS}=6V,V_{GS}=4.5V, I_D≡2.8A P-Channel V_{DS}=-6V,V_{GS}=-4.5V ,I_D≡-2.8A	N-Ch		3.9		nC
			P-Ch		8.3		
Gate-Source Charge	Q_{gs}		N-Ch		1.4		
			P-Ch		1.0		
Gate-Drain Charge	Q_{gd}		N-Ch		1.6		
			P-Ch		2.0		
Input Capacitance	Ciss	N-Channel V_{DS}=10V, V_{GS}=0V, f=1MHz P-Channel V_{DS}=-10V, V_{GS}=0V, f=1MHz	N-Ch	208	263	323	pF
			P-Ch		480		
Output Capacitance	Coss		N-Ch	35	50	65	
			P-Ch		82		
Reverse Transfer Capacitance	Crss		N-Ch	18	29	40	
			P-Ch		72		
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		23	28	
			P-Ch		18	25	
	t_f		N-Ch		12	16	
			P-Ch		15	20	

TYPICAL CHARACTERISTICS (N-Channel)









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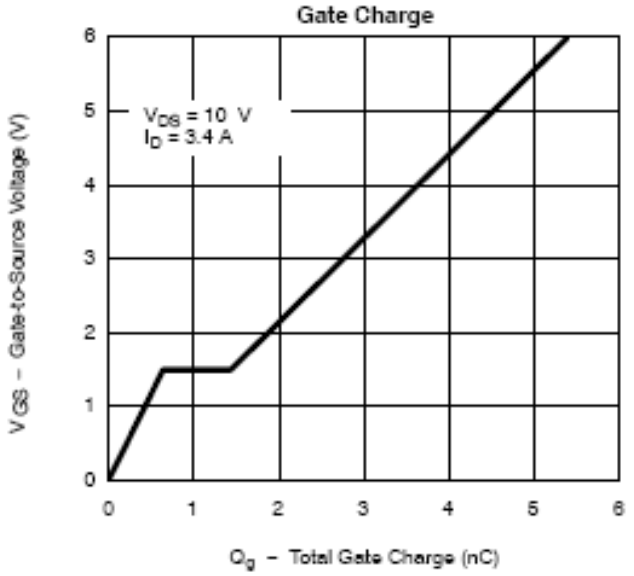
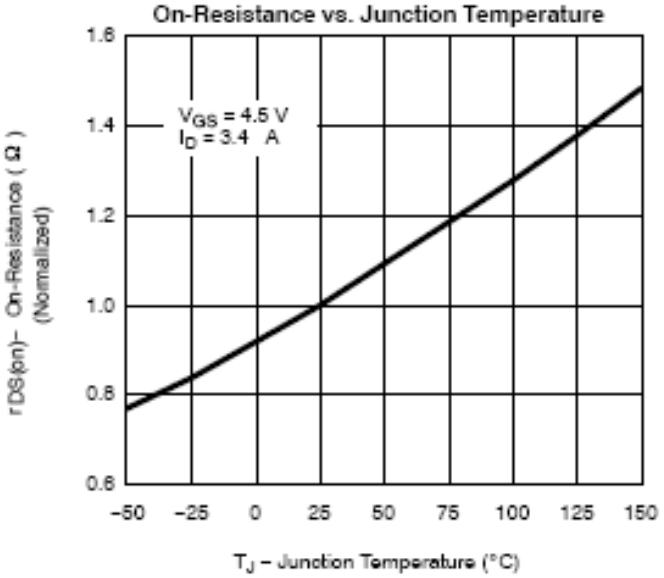
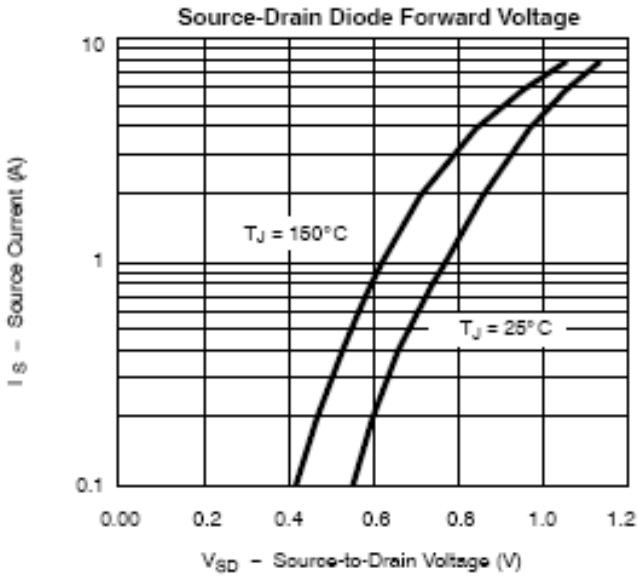
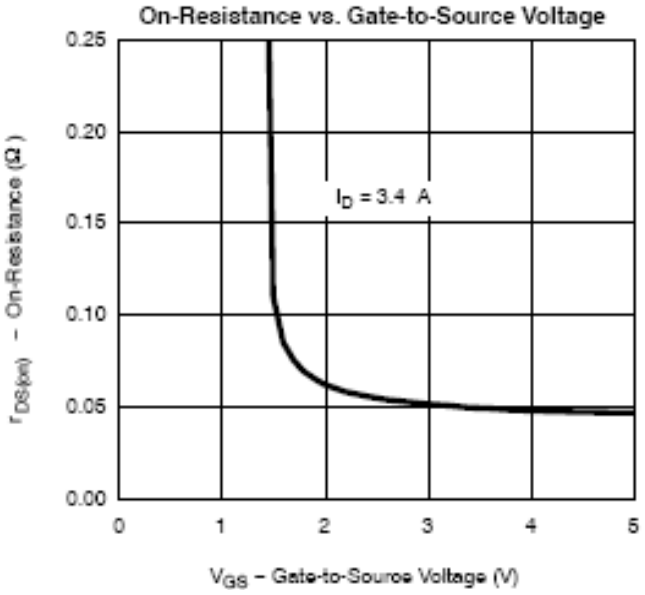
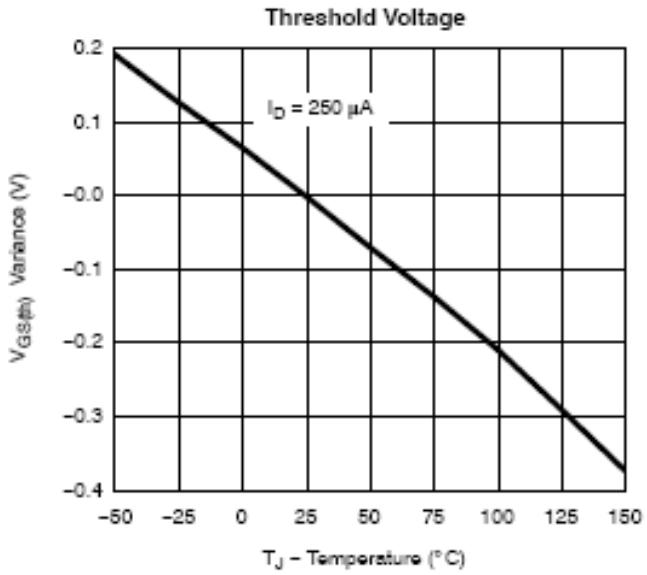


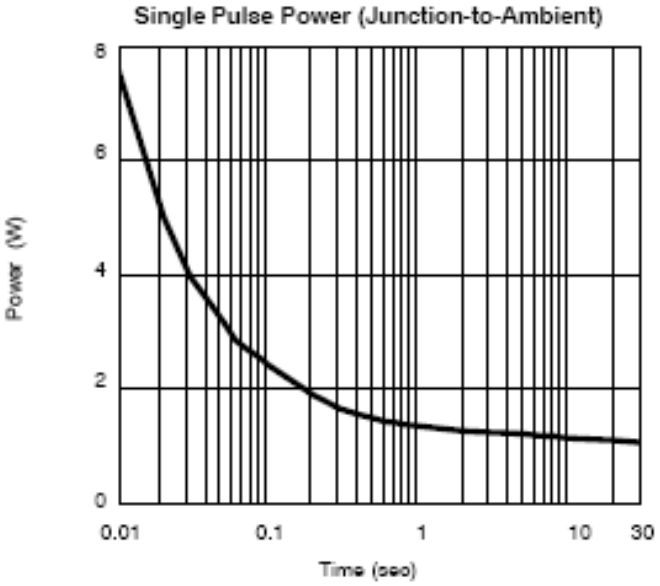


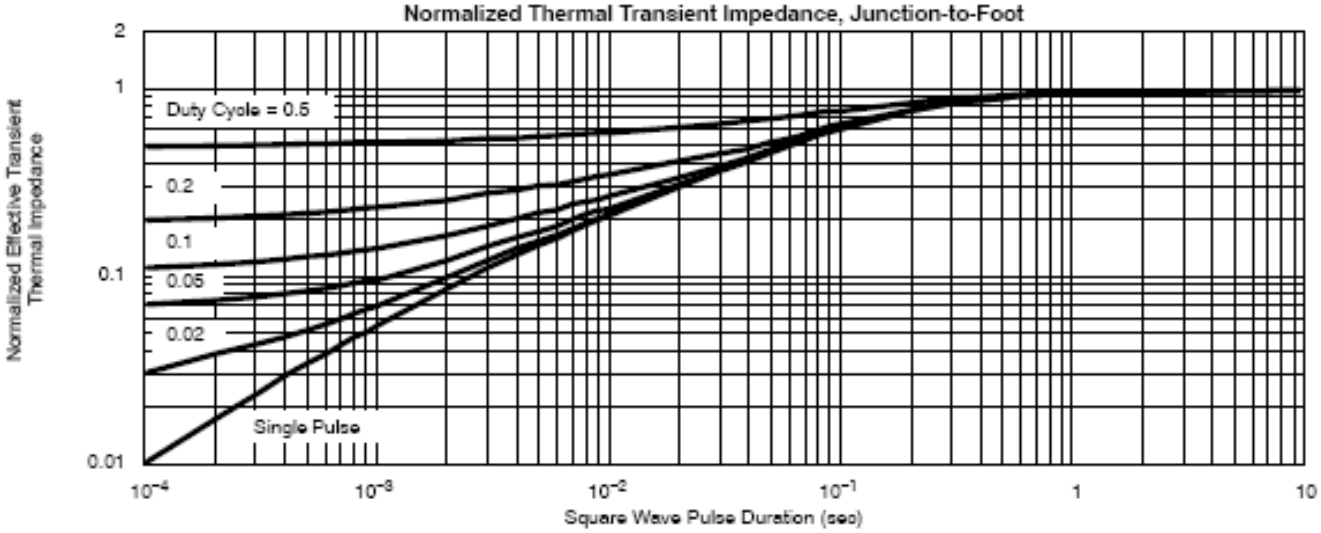




TYPICAL CHARACTERISTICS (N-Channel)

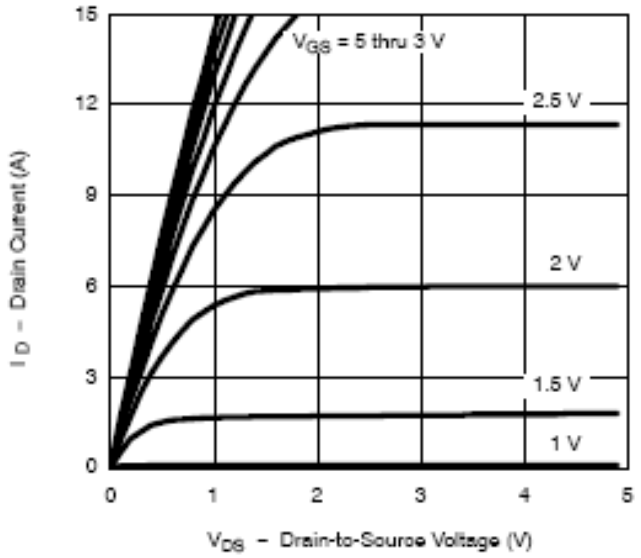




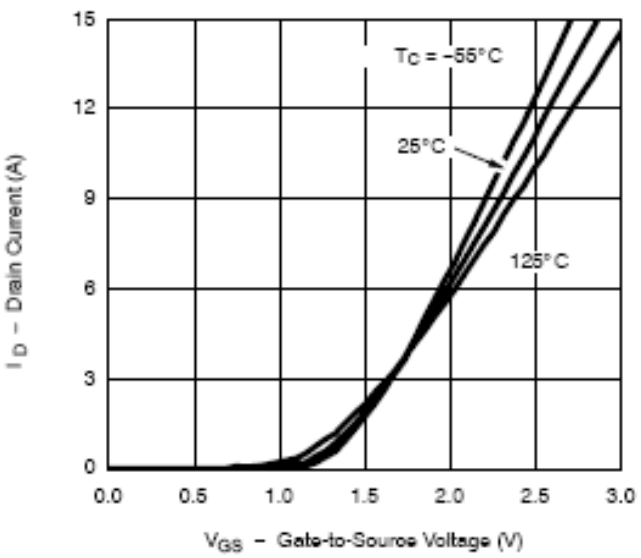


TYPICAL CHARACTERISTICS (P-Channel)

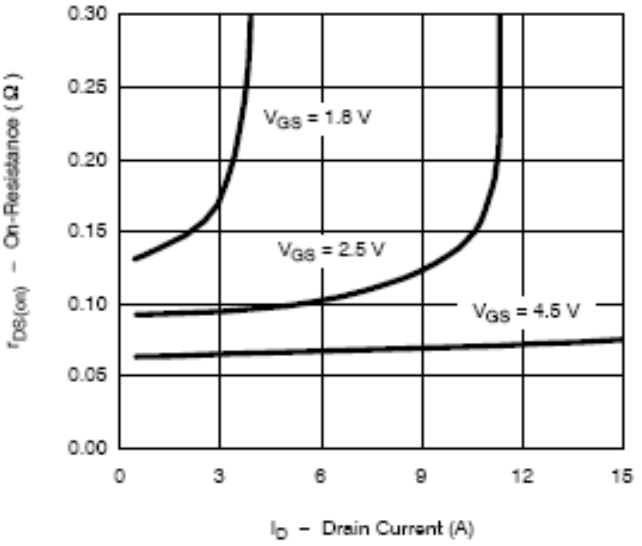
Output Characteristics



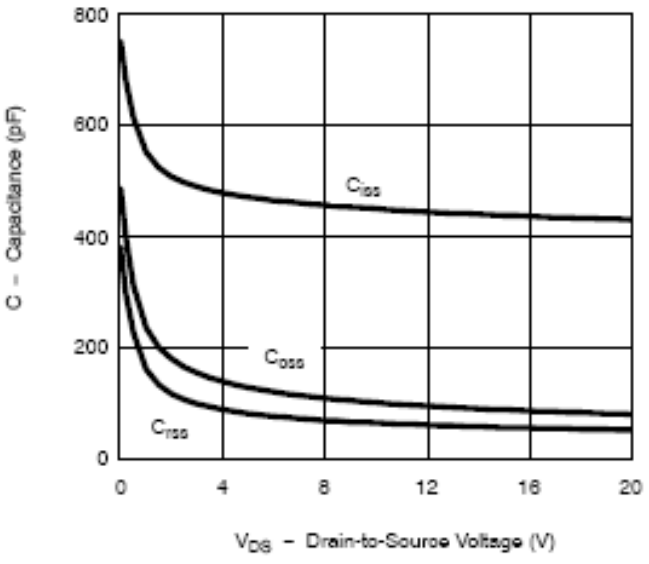
Transfer Characteristics



On-Resistance vs. Drain Current

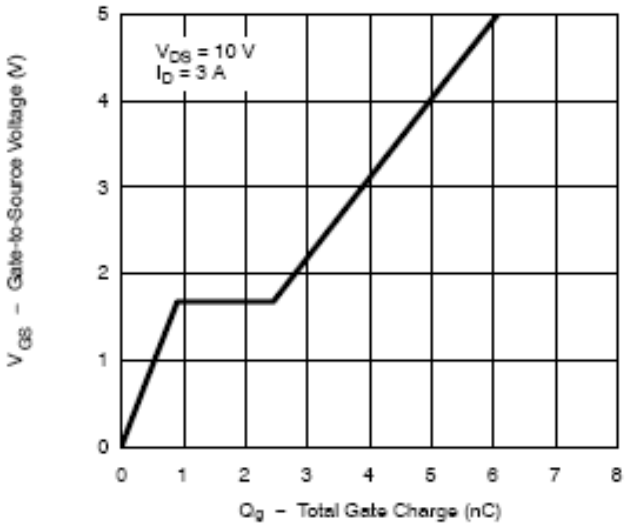


Capacitance

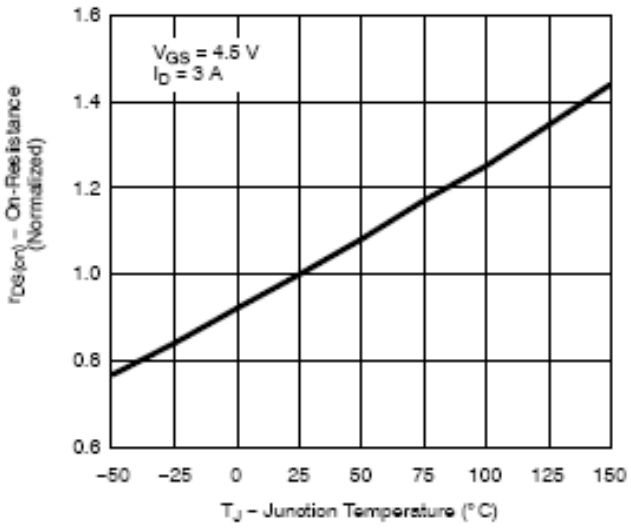


TYPICAL CHARACTERISTICS (P-Channel)

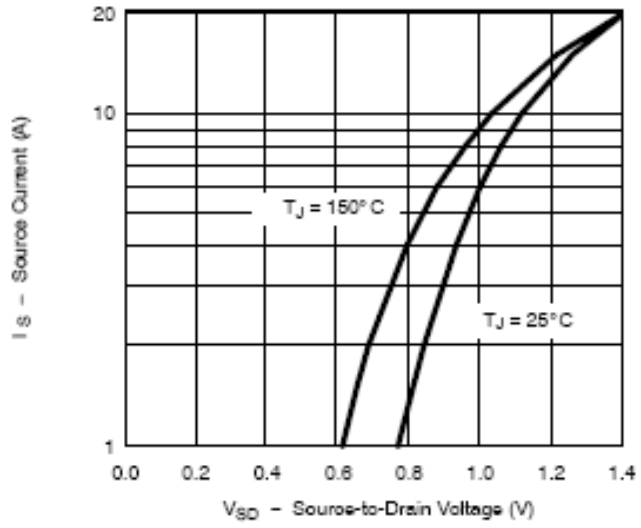
Gate Charge



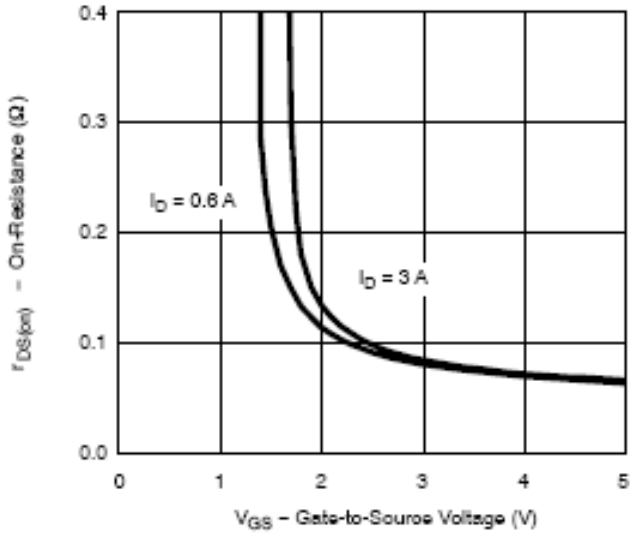
On-Resistance vs. Junction Temperature



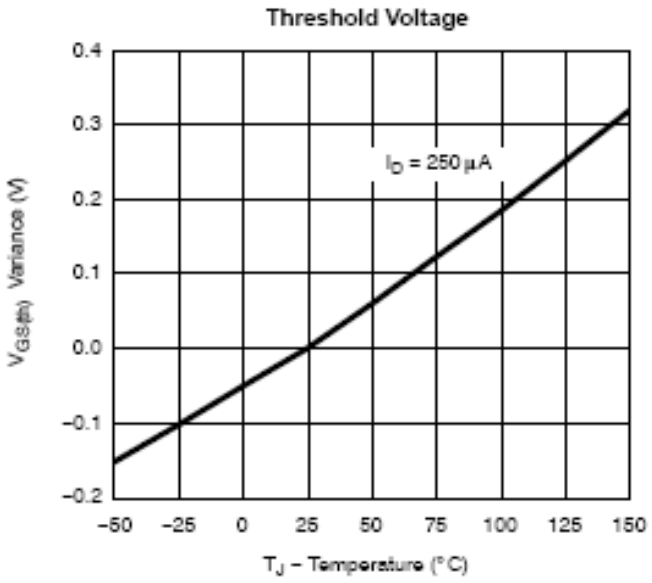
Source-Drain Diode Forward Voltage

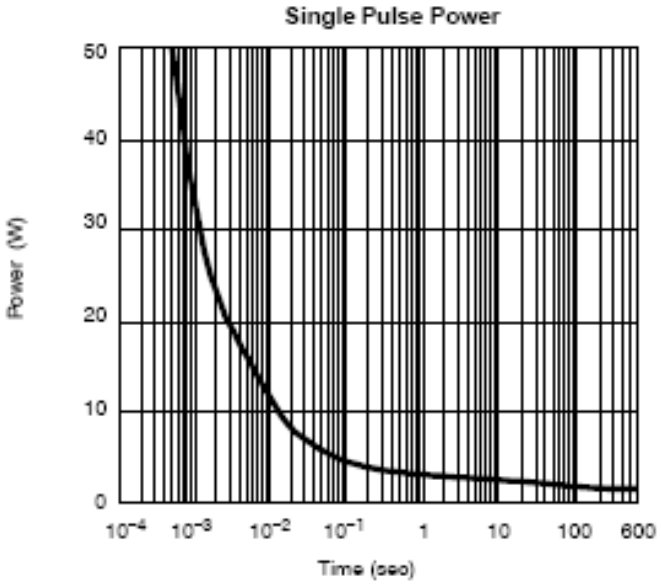


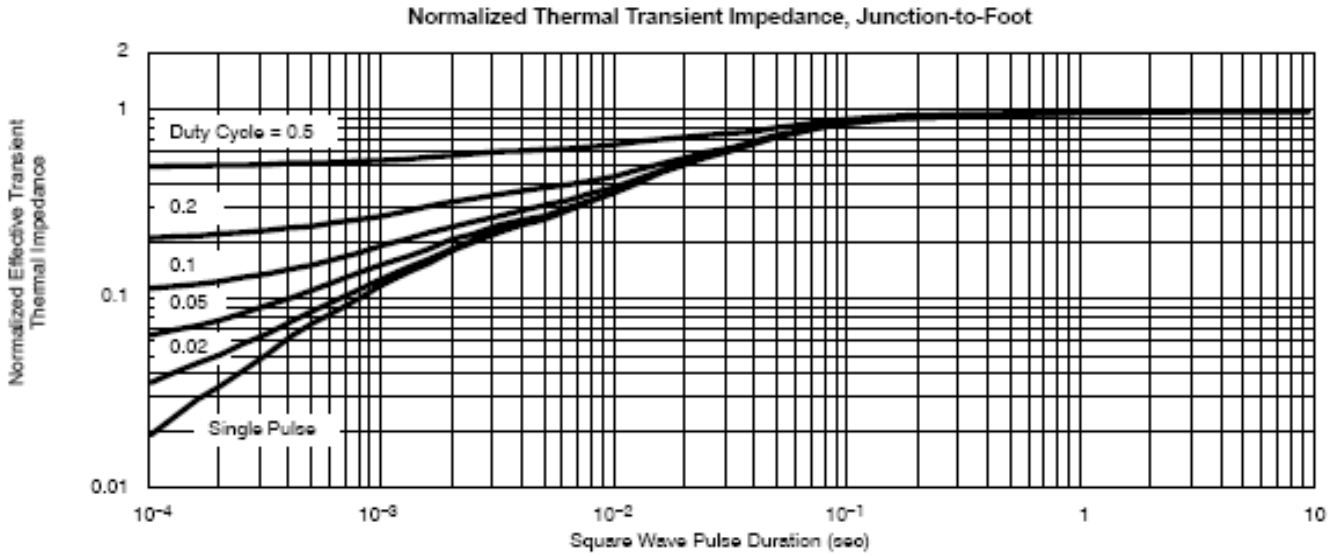
On-Resistance vs. Gate-to-Source Voltage



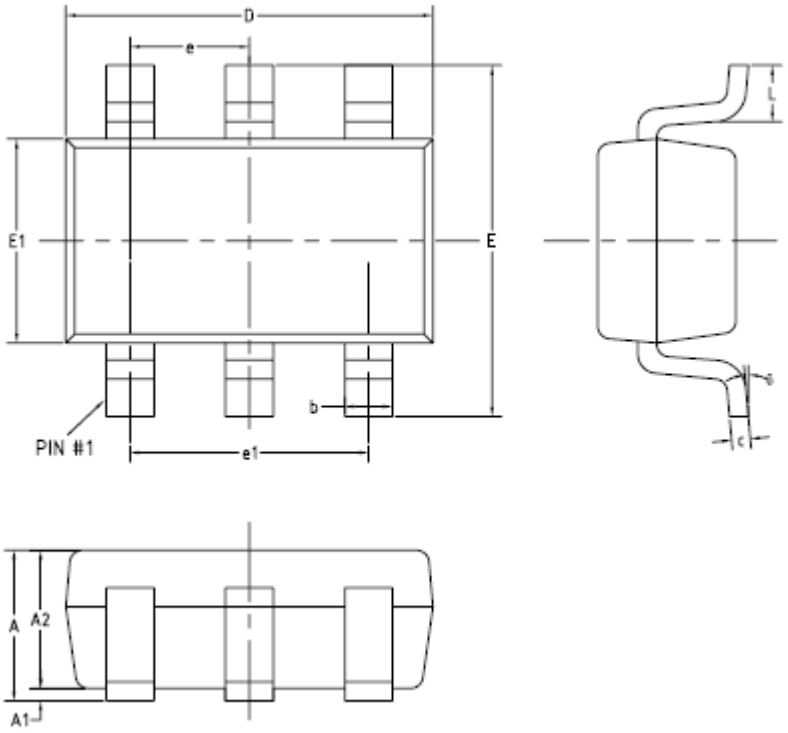
TYPICAL CHARACTERISTICS (P-Channel)







TSOP- 6P PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	–	0.90
A1	0	–	0.10
A2	0.70	0.75	0.80
b	0.35	–	0.50
c	0.08	–	0.20
D	2.82	2.92	3.02
E	2.65	2.80	2.95
E1	1.60	1.65	1.70
e	0.95(BSC)		
e1	1.90(BSC)		
L	0.30	0.40	0.60
L1	0.59REF		
L2	0.25BSC		
θ	0°	–	8°

SYNC Power Corporation
7F-2, No.3-1, Park Street
NanKang District (NKSP), Taipei, Taiwan 115
Phone: 886-2-2655-8178
Fax: 886-2-2655-8468
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