



SPC6605

N & P Pair Enhancement Mode MOSFET

DESCRIPTION

The SPC6605 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.

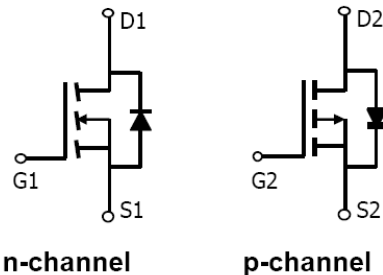
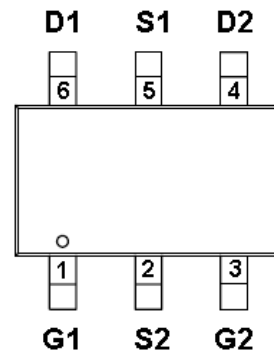
FEATURES

- ◆ N-Channel
20V/3.6A, $R_{DS(ON)}=97m\Omega@V_{GS}=4.5V$
20V/3.1A, $R_{DS(ON)}=113m\Omega@V_{GS}=2.5V$
- ◆ P-Channel
-20V/-2.4A, $R_{DS(ON)}=128m\Omega@V_{GS}=-4.5V$
-20V/-2.0A, $R_{DS(ON)}=188m\Omega@V_{GS}=-2.5V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ TSOP- 6P package design

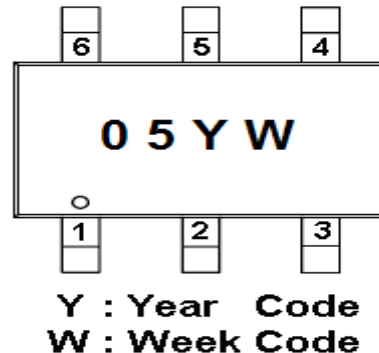
APPLICATIONS

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

PIN CONFIGURATION(TSOP- 6P)



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
SPC6605ST6RG	TSOP- 6P	05YW
SPC6605ST6RGB	TSOP- 6P	05YW

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

※ SPC6605ST6RG : Tape Reel ; Pb – Free

※ SPC6605ST6RGB : Tape Reel ; Pb – Free ; Halogen -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}	± 12	± 12	V	
Continuous Drain Current($T_J=150^{\circ}\text{C}$)	ID	$T_A=25^{\circ}\text{C}$	3.2	-2.4	A
		$T_A=70^{\circ}\text{C}$	2.6	-1.8	
Pulsed Drain Current	I_{DM}	10	-8	A	
Continuous Source Current(Diode Conduction)	I_S	1.6	-1.4	A	
Power Dissipation	Pd	$T_A=25^{\circ}\text{C}$	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	$R_{\theta JA}$	$T \leq 10\text{sec}$	50	52	$^{\circ}\text{C}/\text{W}$
		Steady State	90	95	



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ELECTRICAL CHARACTERISTICS

(TA=25°C 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	0.45	1.2		
		V _{DS} =V _{GS} , I _D =-250uA	P-Ch	-0.45	-1.2		
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} = 4.5V	N-Ch	6		A	
		V _{DS} ≤ -4.5V, V _{GS} =-4.5V	P-Ch	-6			
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =3.6A	N-Ch		0.085	0.097	Ω
		V _{GS} =-4.5V, I _D =-2.4A	P-Ch		0.115	0.128	
		V _{GS} =2.5V, I _D =3.1A	N-Ch		0.100	0.113	
		V _{GS} =-2.5V, I _D =-2.0A	P-Ch		0.165	0.188	
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =-3.4A	N-Ch		10	S	
		V _{DS} =-5V, I _D =-2.4A	P-Ch		6.5		
Diode Forward Voltage	V _{SD}	I _S =1.6A, V _{GS} =0V	N-Ch		0.85	1.2	V
		I _S =-1.6A, V _{GS} =0V	P-Ch		-0.8	-1.2	
Dynamic							
Total Gate Charge	Q _g	N-Channel V _{DS} =10V, V _{GS} =4.5V, I _D =3.6A P-Channel V _{DS} =-16V, V _{GS} =-4.5V, I _D =-2.A	N-Ch		4.4	nC	
Gate-Source Charge	Q _{gs}		P-Ch		7.5		
			N-Ch		0.6		
Gate-Drain Charge	Q _{gd}		P-Ch		1		
			N-Ch		1.9		
Input Capacitance	C _{iss}		P-Ch		3		
		N-Ch		145			
Output Capacitance	C _{oss}	P-Ch		7.5	pF		
		N-Ch		100			
Reverse Transfer Capacitance	C _{rss}	P-Ch		550			
		N-Ch		50			
Turn-On Time	t _{d(on)}	P-Ch		55		nS	
		N-Ch		5.2			
Turn-On Time	t _r	P-Ch		8.5			
		N-Ch		37			
Turn-Off Time	t _{d(off)}	P-Ch		18			
		N-Ch		15			
Turn-Off Time	t _f	P-Ch		22			
		N-Ch		5.7			
			P-Ch		10		



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TYPICAL CHARACTERISTICS (P-Channel)

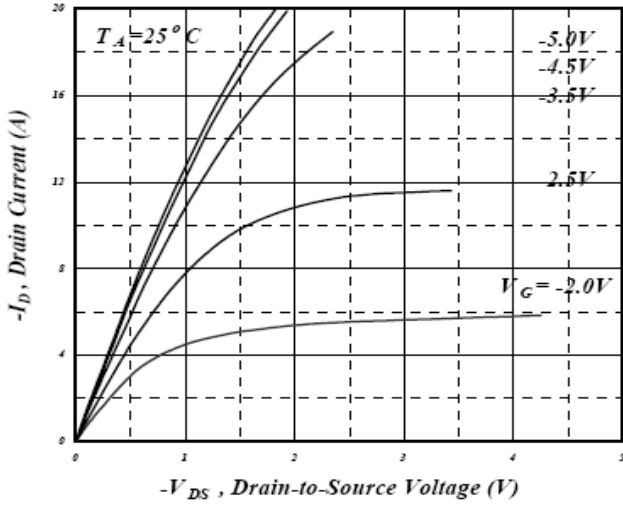


Fig 1. Typical Output Characteristics

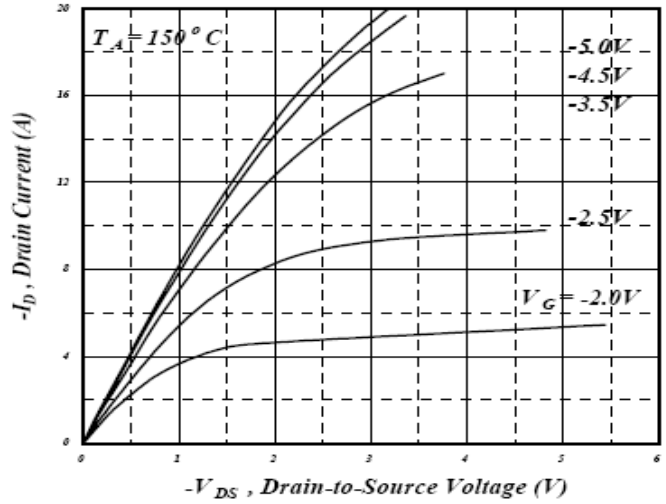


Fig 2. Typical Output Characteristics

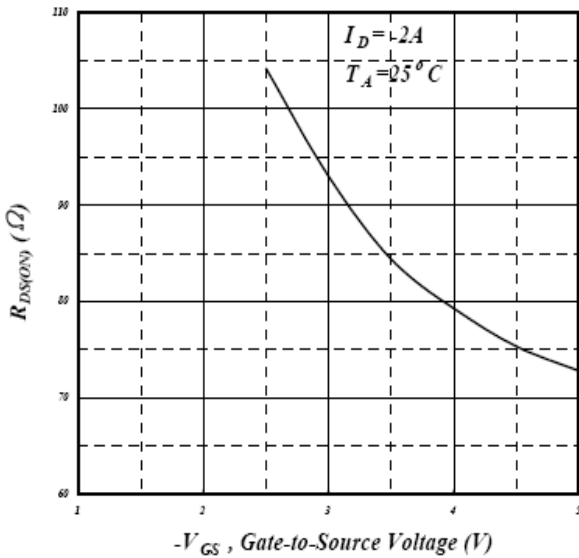


Fig 3. On-Resistance v.s. Gate Voltage

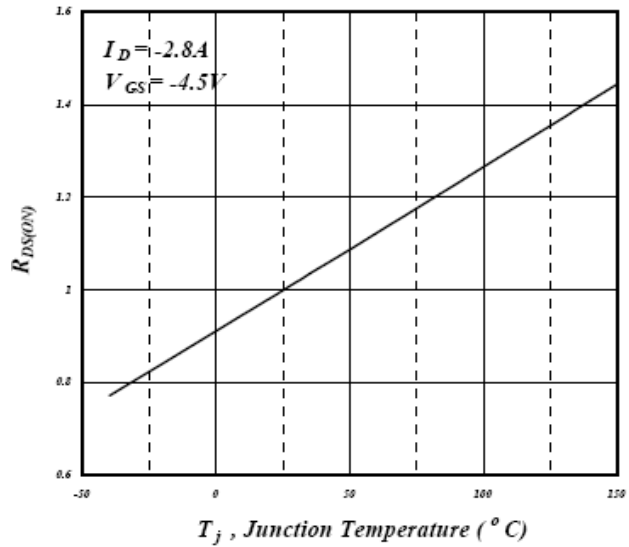


Fig 4. Normalized On-Resistance v.s. Junction Temperature



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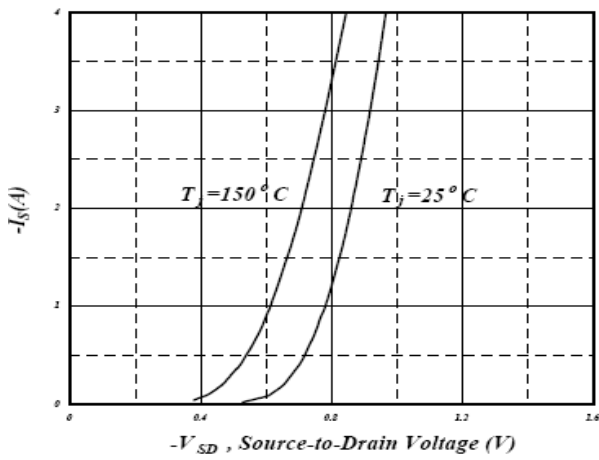


Fig 5. Forward Characteristic of Reverse Diode

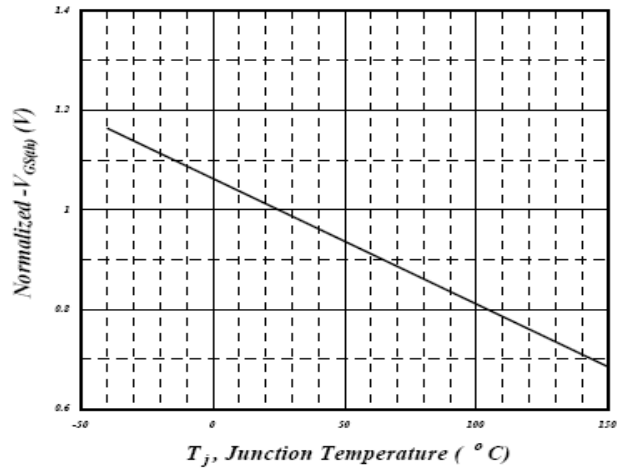


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

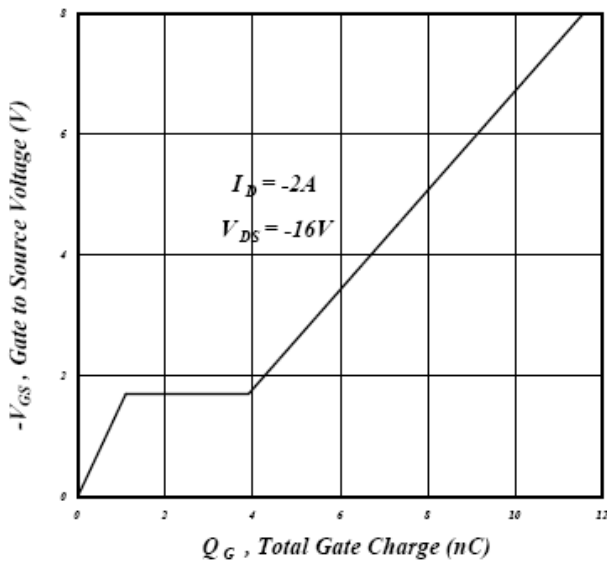


Fig 7. Gate Charge Characteristics

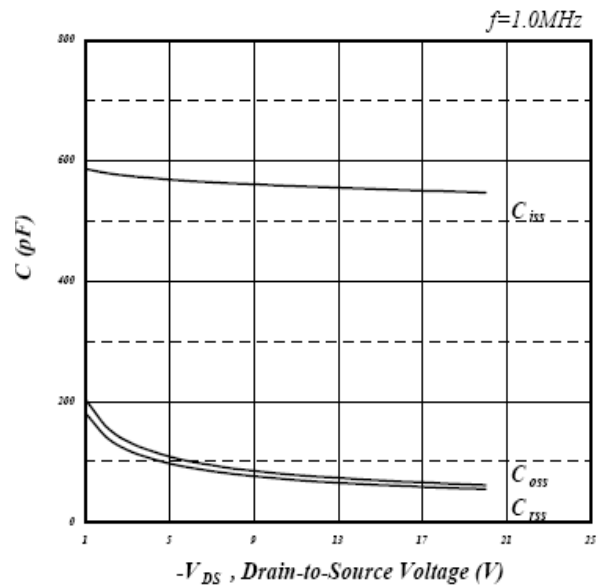


Fig 8. Typical Capacitance Characteristics



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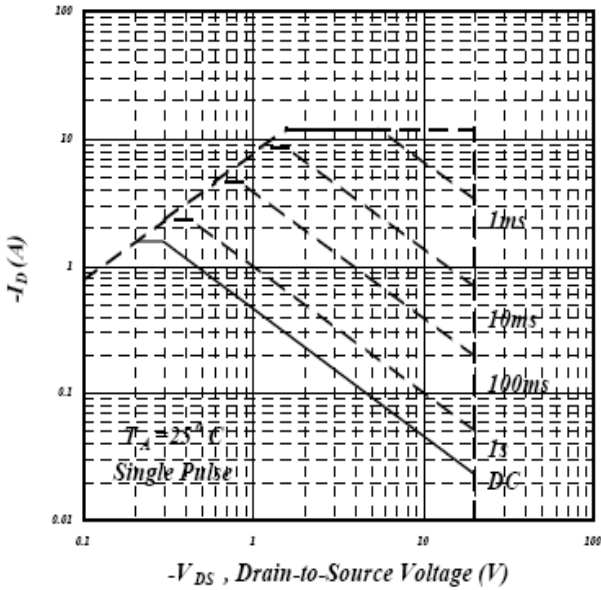


Fig 9. Maximum Safe Operating Area

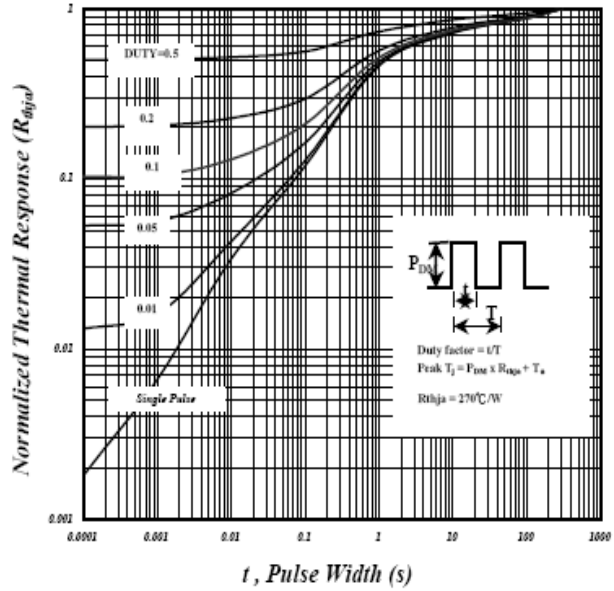


Fig 10. Effective Transient Thermal Impedance

TYPICAL CHARACTERISTICS (N-Channel)

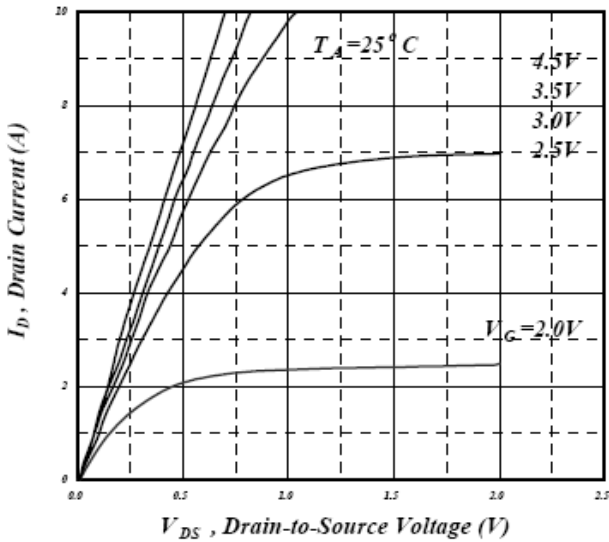


Fig 1. Typical Output Characteristics

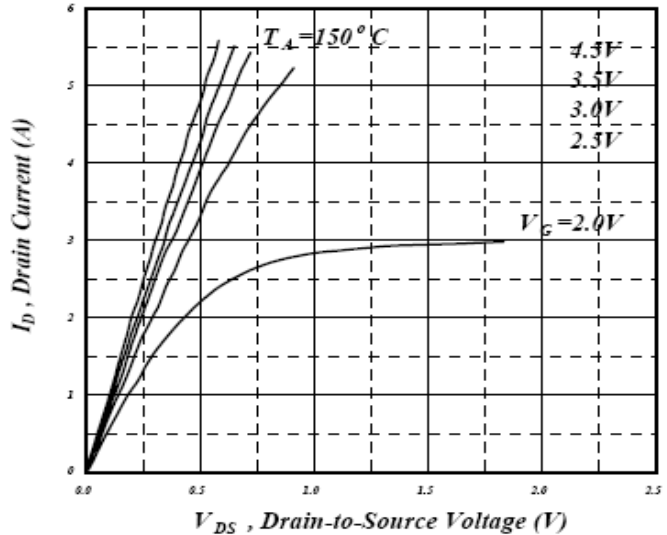


Fig 2. Typical Output Characteristics



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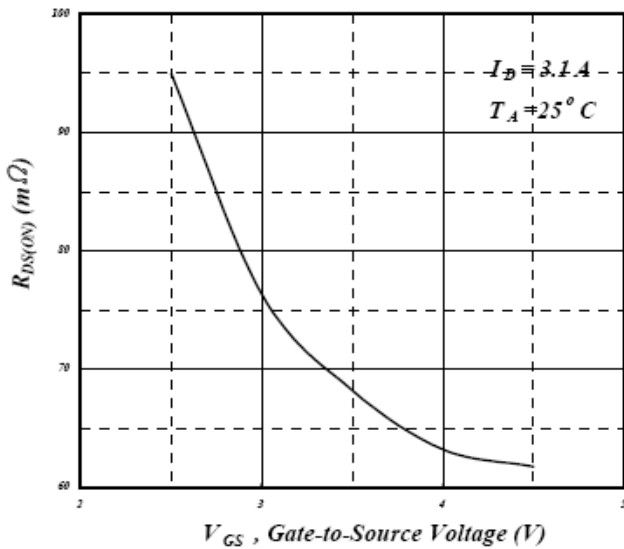


Fig 3. On-Resistance v.s. Gate Voltage

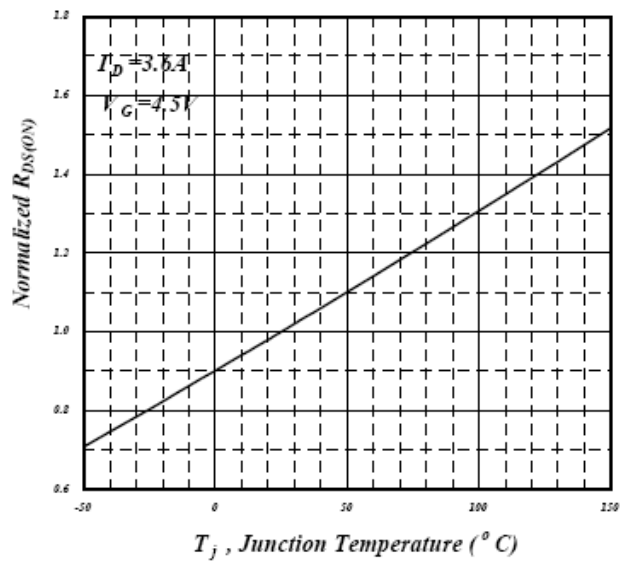


Fig 4. Normalized On-Resistance

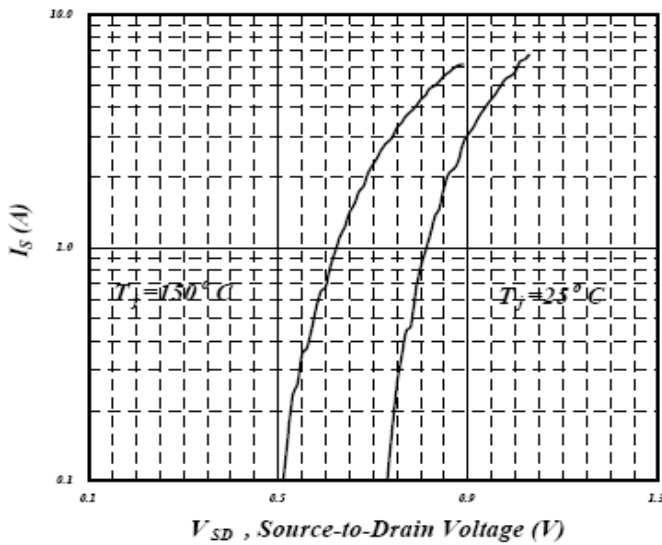


Fig 5. Forward Characteristic of Reverse Diode

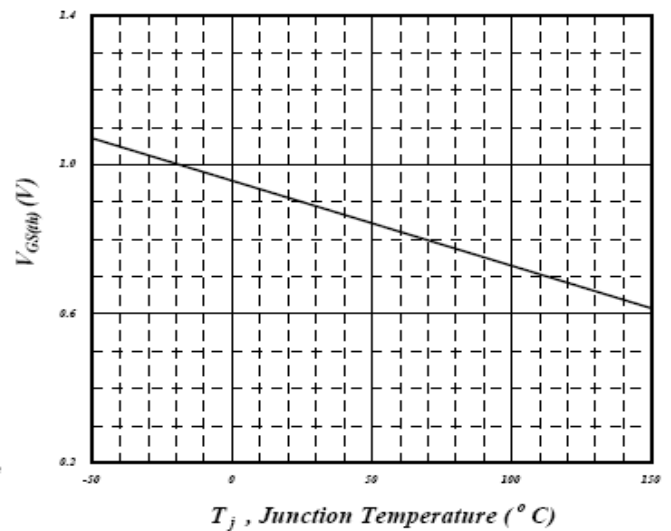


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



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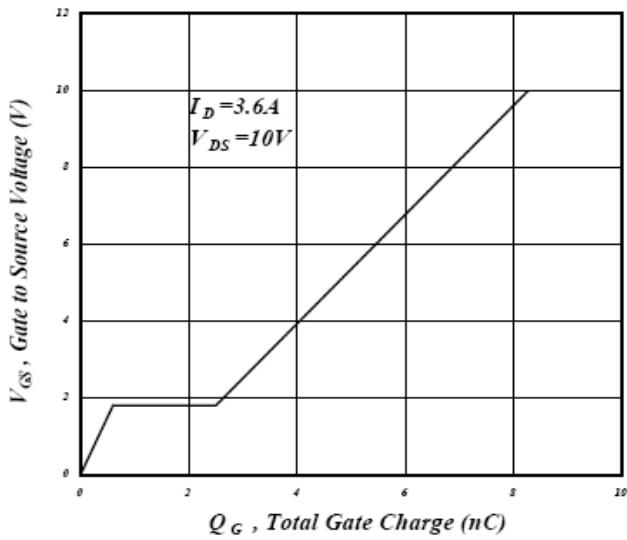


Fig 7. Gate Charge Characteristics

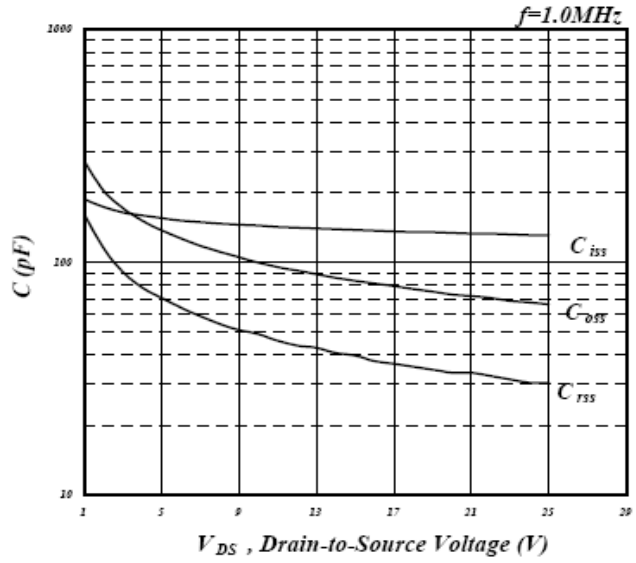


Fig 8. Typical Capacitance Characteristics

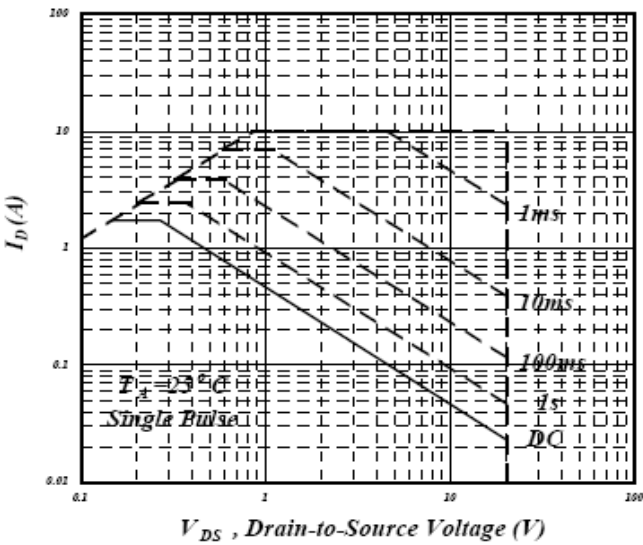


Fig 9. Maximum Safe Operating Area

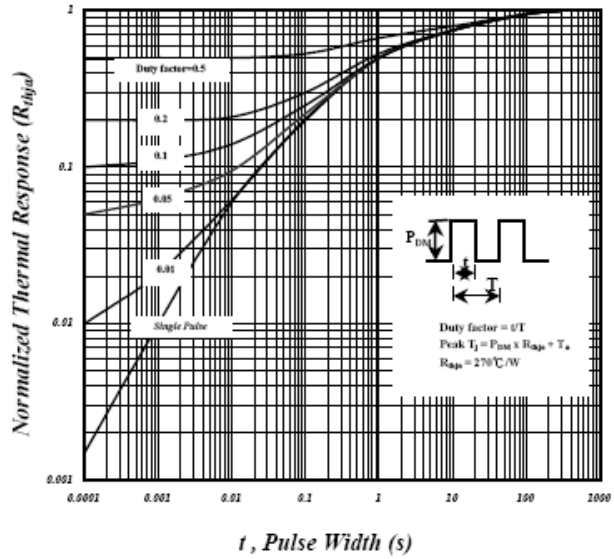


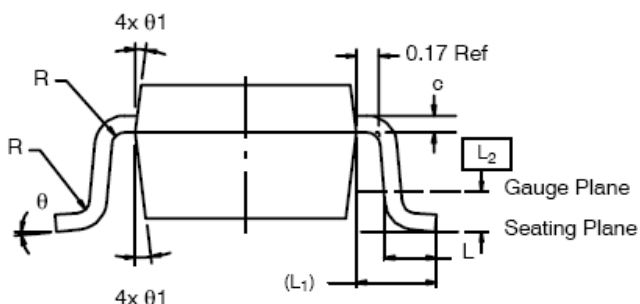
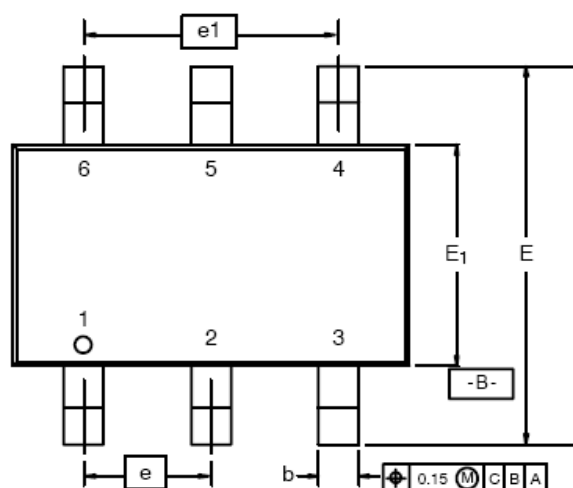
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TSOP- 6P PACKAGE OUTLINE



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	-	1.10	0.036	-	0.043
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		



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