GSS4816S

DUAL N-CHANNEL MOSFET WITH SCHOTTKY DIODE

CH1	BV_{DSS}	30V
	$R_{DS(ON)}$	22mΩ
	I_D	6.7A
CH2	BV_{DSS}	30V
	$R_{DS(ON)}$	13mΩ
	I_D	11.5A

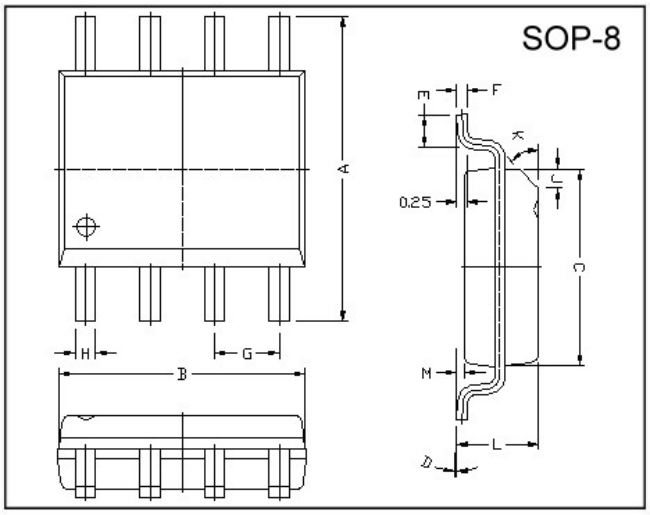
Description

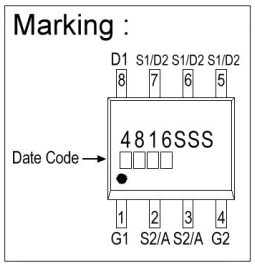
The GSS4816S provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.
The SOP-8 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

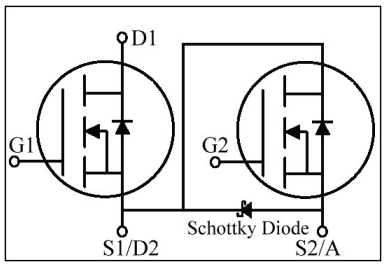
Features

*Simple Drive Requirement
*DC-DC Converter Suitable
*Fast Switching Performance

Package Dimensions







REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.49
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.375 REF.	
E	0.40	0.90	K	45°	
F	0.19	0.25	G	1.27 TYP.	

Absolute Maximum Ratings

Parameter	Symbol	Ratings		Unit
		CH-1	CH-2	
Drain-Source Voltage	V_{DS}	30	30	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current[3]	I_D @T_A=25℃	6.7	11.5	A
Continuous Drain Current[3]	I_D @T_A=70℃	5.3	9.2	A
Pulsed Drain Current[1]	I_{DM}	30	40	A
Total Power Dissipation	P_D @T_A=25℃	1.4	2.4	W
Linear Derating Factor		0.01	0.02	W/℃
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150		℃

Thermal Data

Parameter	Symbol	Value		Unit
		Typ.	Max.	
Thermal Resistance Junction-ambient[3]	Rthj-a(CH-1)	70	90	℃/W
Thermal Resistance Junction-ambient[3]	Rthj-a(CH-2)	42	53	℃/W
Thermal Resistance Junction-ambient[3]	Rthj-a(Schottky)	52	60	℃/W

CH-1 Electrical Characteristics (Tj = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250uA
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle Tj$	-	0.03	-	V/℃	Reference to 25℃, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	1.0	-	3.0	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance	g_{fs}	-	10	-	S	V_{DS}=10V, I_D=6A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	1	uA	V_{DS}=30V, V_{GS}=0
Drain-Source Leakage Current(Tj=70℃)		-	-	25	uA	V_{DS}=24V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	-	22	mΩ	V_{GS}=10V, I_D=6A
			-	30		V_{GS}=4.5V, I_D=5A
Total Gate Charge[2]	Q_g	-	11	18	nC	I_D=6A V_{DS}=24V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	3	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	7	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	9	-	ns	V_{DS}=15V I_D=1A V_{GS}=10 R_G=3.3Ω R_D=15Ω
Rise Time	T_r	-	7	-		
Turn-off Delay Time	$T_{d(off)}$	-	22	-		
Fall Time	T_f	-	7	-		
Input Capacitance	C_{iss}	-	780	1250	pF	V_{GS}=0V V_{DS}=25V f=1.0MHz
Output Capacitance	C_{oss}	-	180	-		
Reverse Transfer Capacitance	C_{rss}	-	140	-		
Gate Resistance	R_g	-	1.25	-	Ω	f=1.0MHz

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage[2]	V_{SD}	-	-	1.2	V	I_S=1.2A, V_{GS}=0V
Reverse Recovery Time[2]	T_{rr}	-	21	-	ns	I_S=6A, V_{GS}=0V dI/dt=100A/μs
Reverse Recovery Charge	Q_{rr}	-	15	-	nC	

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width≦300us, duty cycle≦2%.

3. Surface mounted on 1 in^2 copper pad of FR4 board, t≦10sec.

CH-2 Electrical Characteristics (Tj = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250uA
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle Tj$	-	0.03	-	V/℃	Reference to 25℃, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	1.0	-	3.0	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance	g_{fs}	-	15	-	S	V_{DS}=10V, I_D=11A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	100	uA	V_{DS}=30V, V_{GS}=0
Drain-Source Leakage Current(Tj=70℃)		-	-	1	mA	V_{DS}=24V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	-	13	mΩ	V_{GS}=10V, I_D=11A
			-	18.5		V_{GS}=4.5V, I_D=8A
Total Gate Charge[2]	Q_g	-	20	30	nC	I_D=8A V_{DS}=24V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	5	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	12	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	12	-	ns	V_{DS}=15V I_D=1A V_{GS}=10 R_G=3.3Ω R_D=15Ω
Rise Time	T_r	-	8	-		
Turn-off Delay Time	$T_{d(off)}$	-	31	-		
Fall Time	T_f	-	12	-		
Input Capacitance	C_{iss}	-	1450	2320	pF	V_{GS}=0V V_{DS}=25V f=1.0MHz
Output Capacitance	C_{oss}	-	320	-		
Reverse Transfer Capacitance	C_{rss}	-	230	-		
Gate Resistance	R_g	-	1.5	-	Ω	f=1.0MHz

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage[2]	V_{SD}	-	-	0.5	V	I_S=1.0A, V_{GS}=0V
Reverse Recovery Time[2]	T_{rr}	-	27	-	ns	I_S=8A, V_{GS}=0V dI/dt=100A/μs
Reverse Recovery Charge	Q_{rr}	-	18	-	nC	

Schottky Characteristics @ Tj=25℃(unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward Voltage Drop	V_F	-	0.47	0.5	V	I_F=1A
Max. Reverse Leakage Current	I_{RM}	-	0.004	0.2	mA	V_R=30V
		-	0.5	1	mA	V_R=30V, Tj=100℃
Junction Capacitance	C_T	-	66	-	pF	V_R=10V

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width≦300us, duty cycle≦2%.

3. Surface mounted on 1 in^2 copper pad of FR4 board, t≦10sec.

Characteristics Curve CH-1

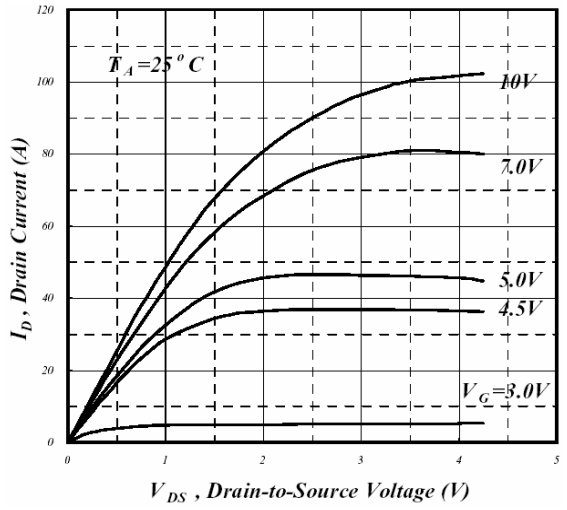


Fig 1. Typical Output Characteristics

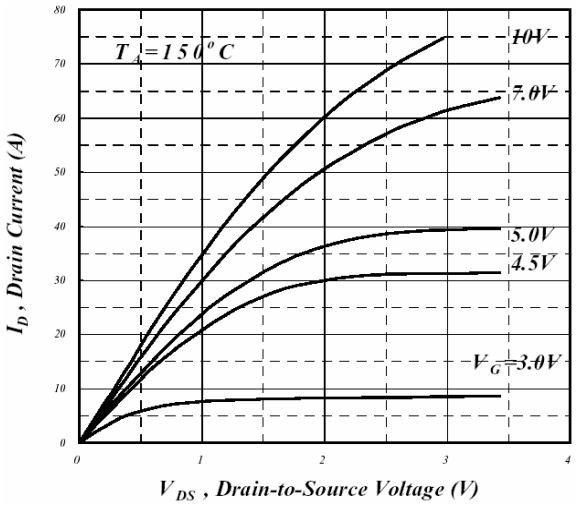


Fig 2. Typical Output Characteristics

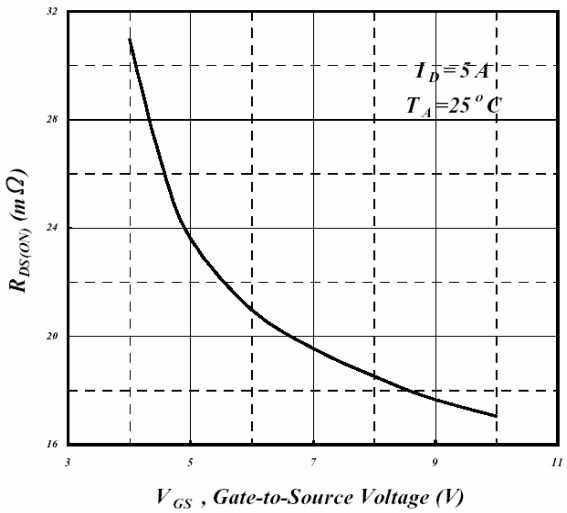


Fig 3. On-Resistance v.s. Gate Voltage

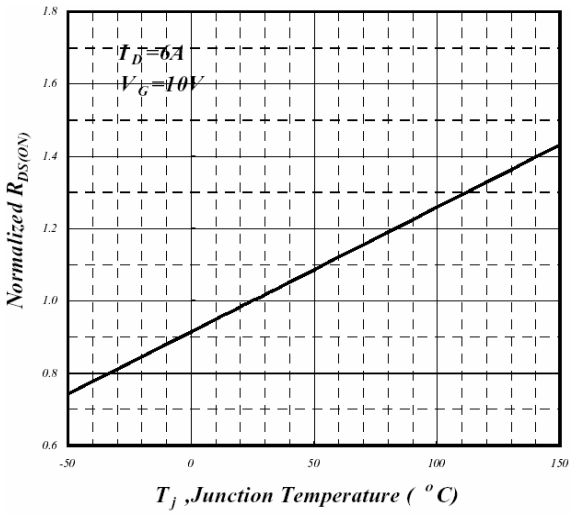


Fig 4. Normalized On-Resistance v.s. Junction Temperature

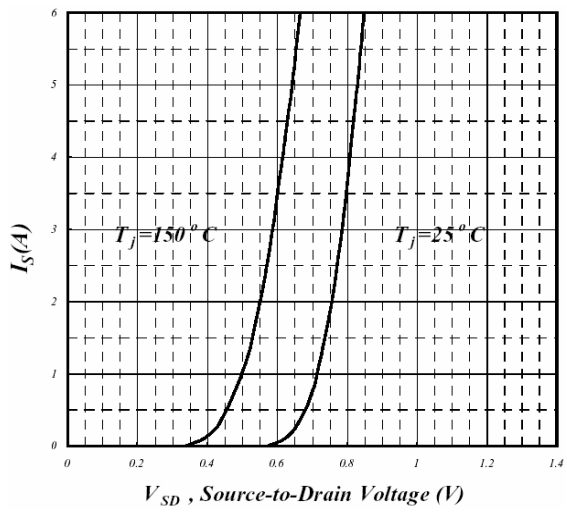


Fig 5. Forward Characteristics of Reverse Diode

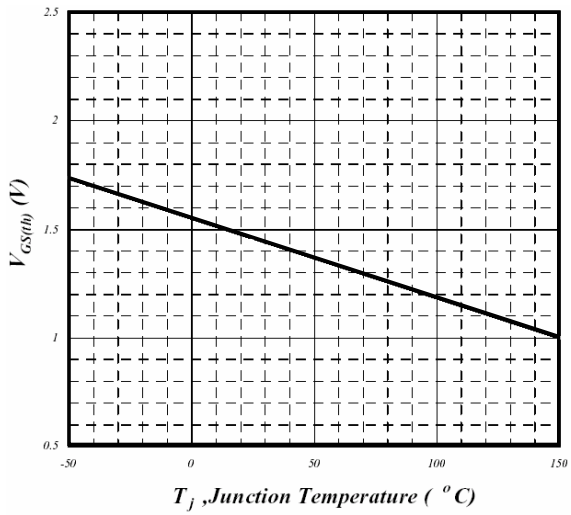


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

CH-1

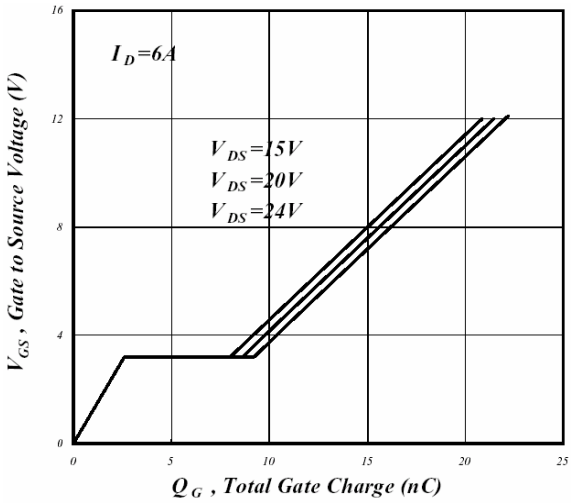


Fig 7. Gate Charge Characteristics

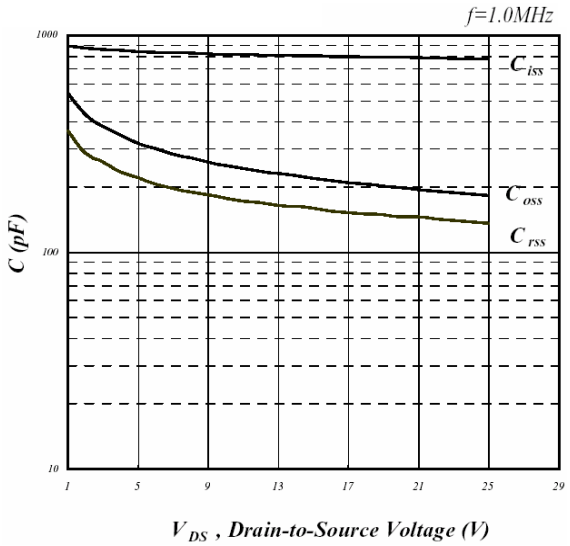


Fig 8. Typical Capacitance Characteristics

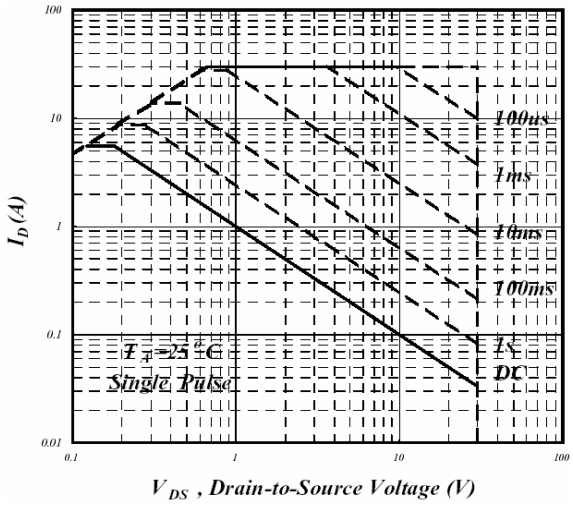


Fig 9. Maximum Safe Operating Area

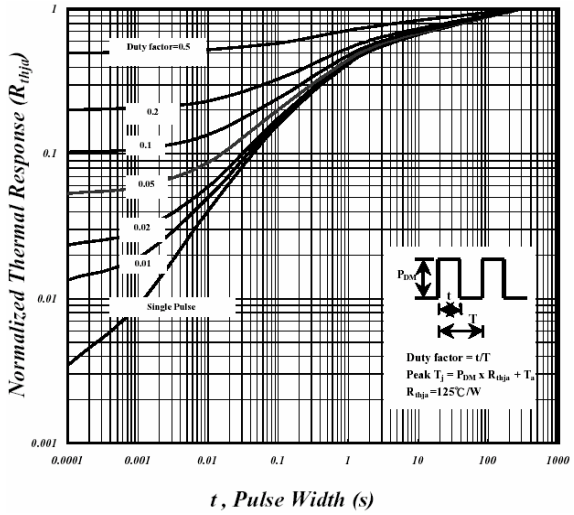


Fig 10. Effective Transient Thermal Impedance

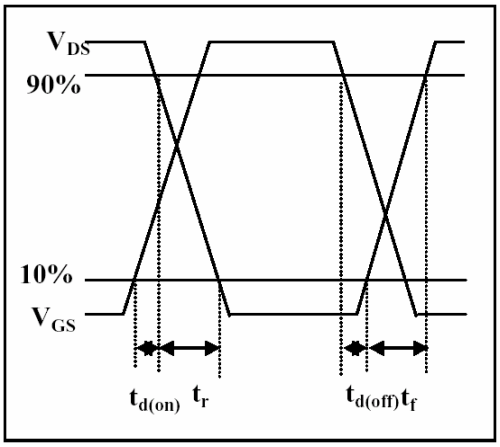


Fig 11. Switching Time Waveform

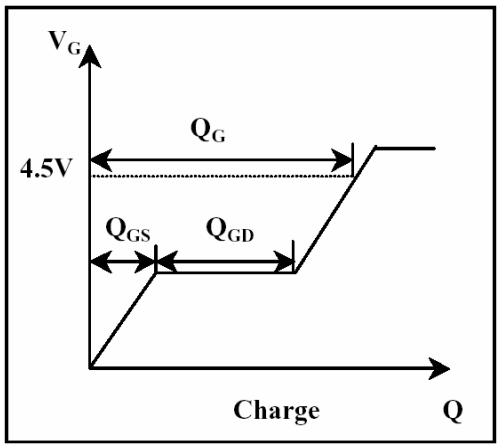


Fig 12. Gate Charge Waveform

CH-2

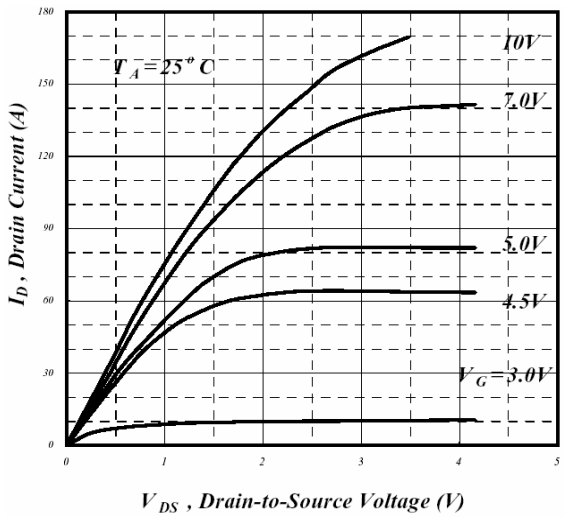


Fig 1. Typical Output Characteristics

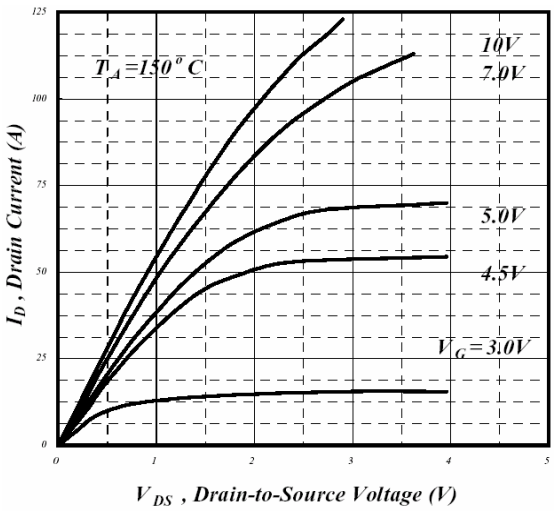


Fig 2. Typical Output Characteristics

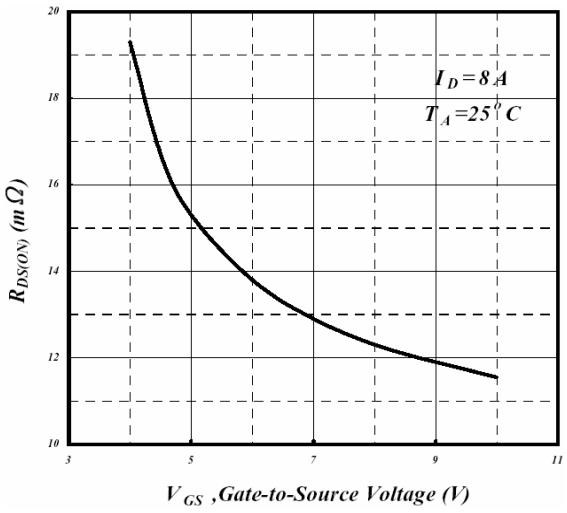


Fig 3. On-Resistance v.s. Gate Voltage

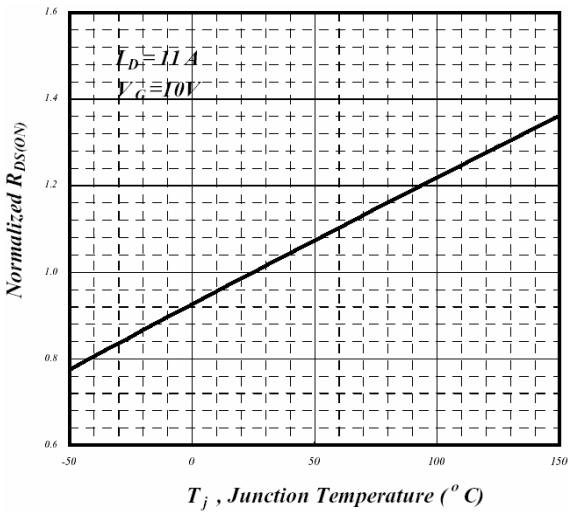


Fig 4. Normalized On-Resistance v.s. Junction Temperature

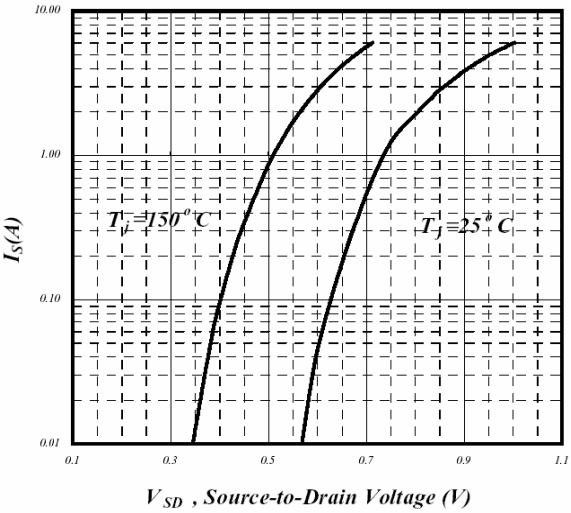


Fig 5. Forward Characteristics of Reverse Diode

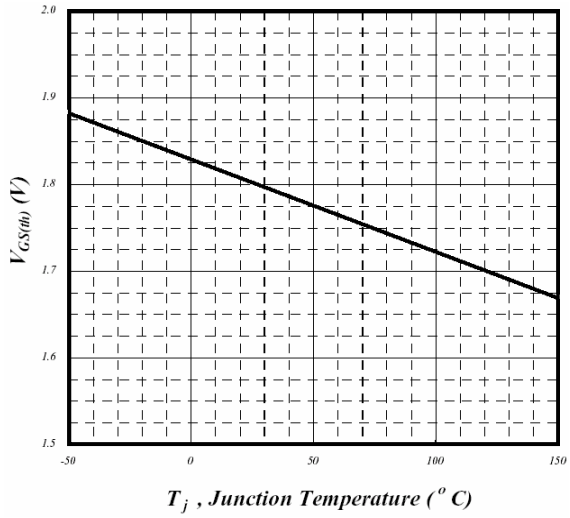


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

CH-2

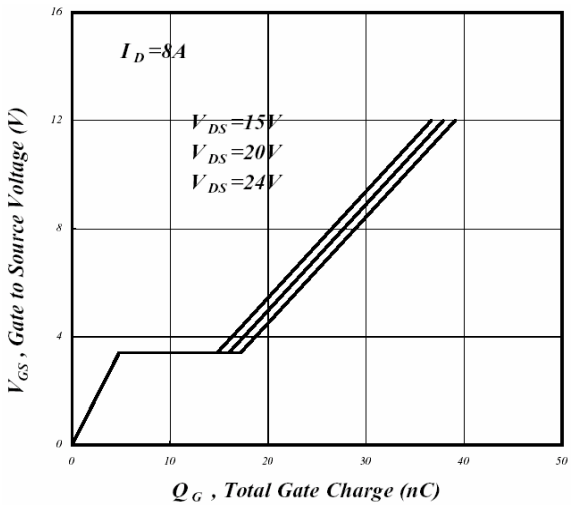


Fig 7. Gate Charge Characteristics

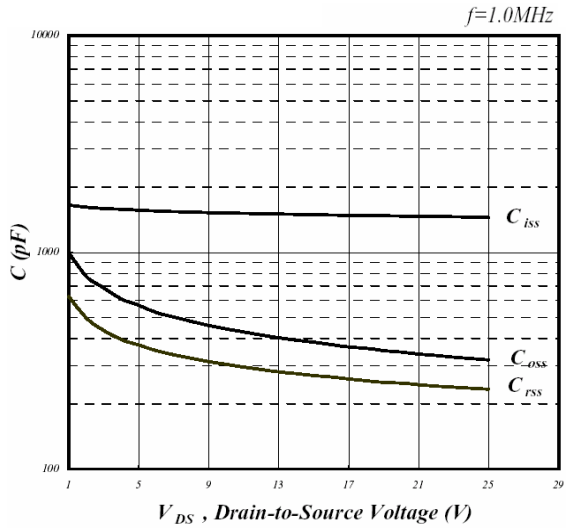


Fig 8. Typical Capacitance Characteristics

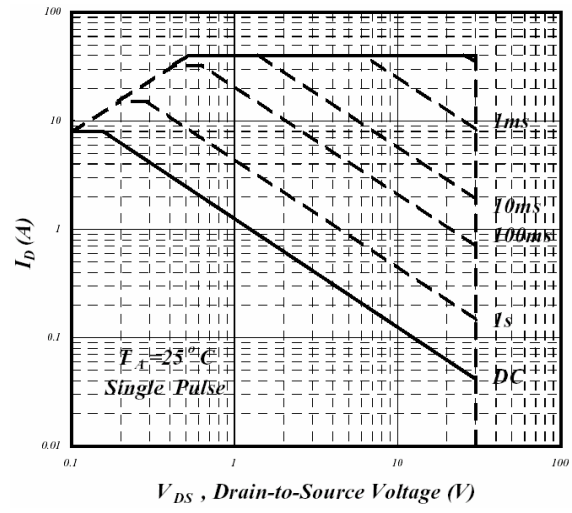


Fig 9. Maximum Safe Operating Area

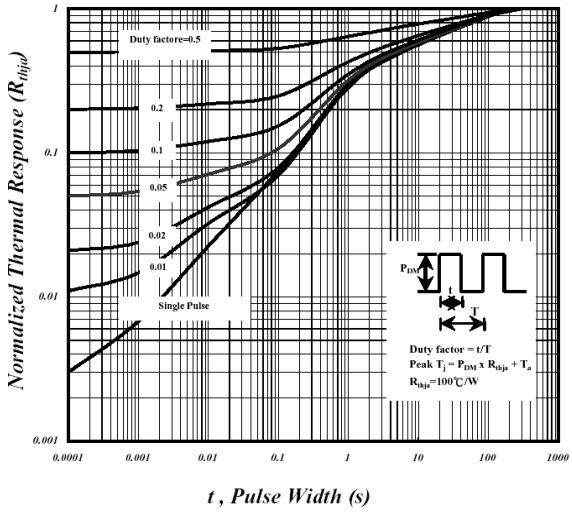


Fig 10. Effective Transient Thermal Impedance

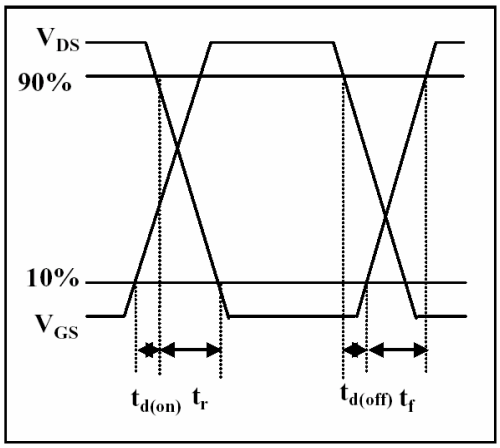


Fig 11. Switching Time Waveform

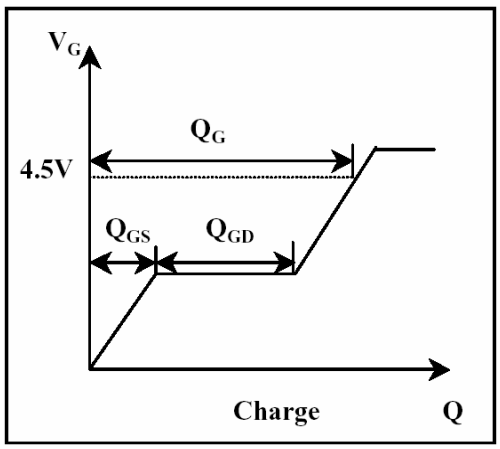


Fig 12. Gate Charge Waveform

Schottky

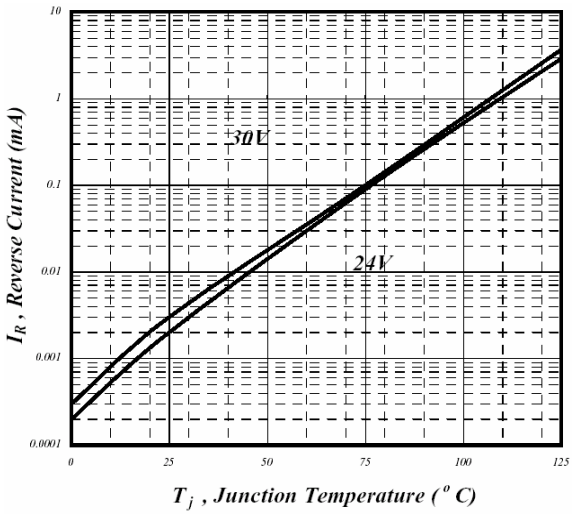


Fig 1. Reverse Current v.s. Junction Temperature

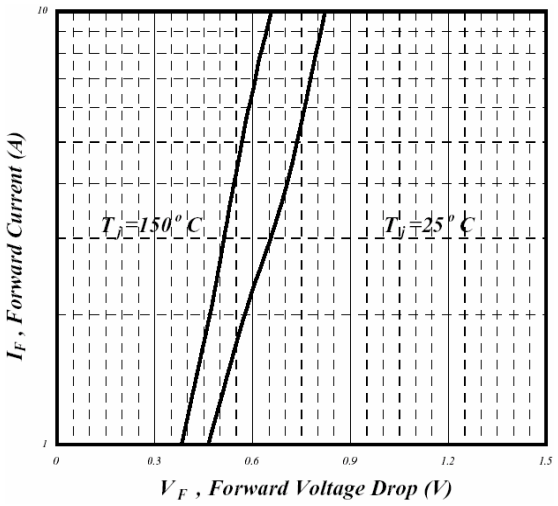


Fig 2. Typical Forward Characteristics

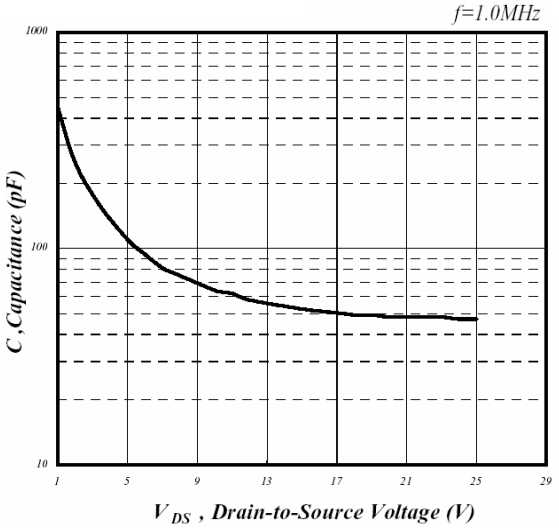


Fig 3. Typical Junction Capacitance

Head Office And Factory:
- **Taiwan**: No. 17-1 Tatung Rd. Fu Kou Hsin-Chu Industrial Park, Hsin-Chu, Taiwan, R. O. C.
  TEL : 886-3-597-7061 FAX : 886-3-597-9220, 597-0785
- **China**: (201203) No.255, Jang-Jiang Tsai-Lueng RD. , Pu-Dung-Hsin District, Shang-Hai City, China
  TEL : 86-21-5895-7671 ~ 4 FAX : 86-21-38950165