GT2531

N AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

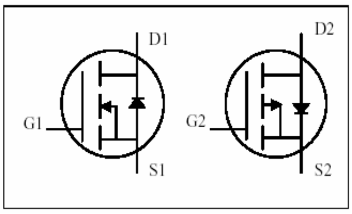
N-CH	BV_{DSS}	16V
	$R_{DS(ON)}$	58mΩ
	I_D	3.5A
P-CH	BV_{DSS}	-16V
	$R_{DS(ON)}$	125mΩ
	I_D	-2.5A

Description

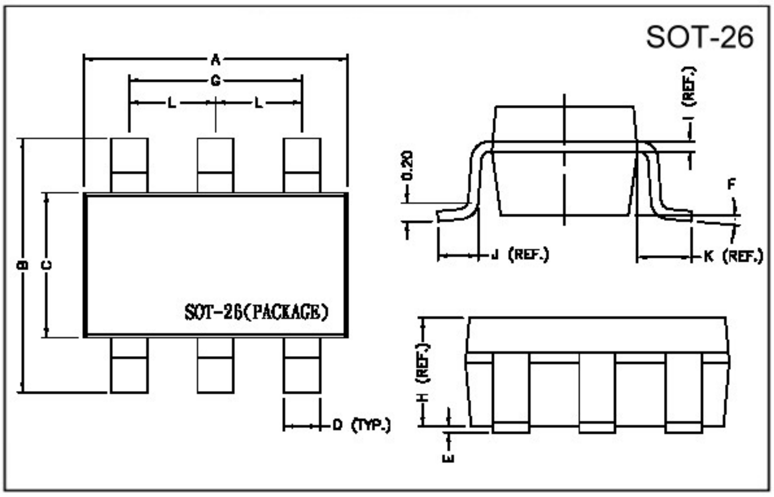
The GT2531 utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.
The SOT-26 package is universally used for all commercial-industrial surface mount applications.

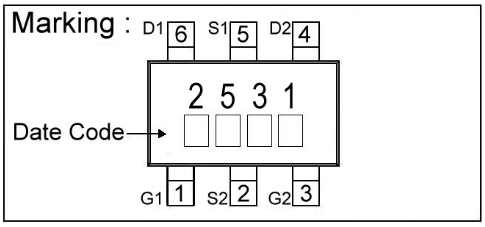
Features

*Low Gate Change
*Low On-resistance
*RoHS Compliant



Package Dimensions





REF.	Millimeter		REF.	Dimensions
	Min.	Max.		Millimeter
A	2.70	3.10	G	1.90 REF.
B	2.60	3.00	H	1.20 REF.
C	1.40	1.80	I	0.12 REF.
D	0.30	0.55	J	0.37 REF.
E	0	0.10	K	0.60 REF.
F	0°	10°	L	0.95 REF.

Absolute Maximum Ratings

Parameter	Symbol	Ratings		Unit
		N-channel	P-channel	
Drain-Source Voltage	V_{DS}	16	-16	V
Gate-Source Voltage	V_{GS}	± 8	± 8	V
Continuous Drain Current[3]	I_D @TA=25℃	3.5	-2.5	A
Continuous Drain Current[3]	I_D @TA=70℃	2.8	-2.0	A
Pulsed Drain Current[1]	I_{DM}	10	-10	A
Total Power Dissipation	P_D @TA=25℃	1.14		W
Linear Derating Factor		0.01		W/℃
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150		℃

Thermal Data

Parameter		Symbol	Value	Unit
Thermal Resistance Junction-ambient[3]	Max.	Rthj-a	110	℃/W

N-Channel Electrical Characteristics (Tj = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	16	-	-	V	V_{GS}=0, I_D=250uA
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle Tj$	-	0.01	-	V/℃	Reference to 25℃, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	0.2	-	1.0	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance	g_{fs}	-	9	-	S	V_{DS}=5V, I_D=3A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ± 8V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	1	uA	V_{DS}=16V, V_{GS}=0
Drain-Source Leakage Current(Tj=70℃)		-	-	25	Ua	V_{DS}=12V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	-	58	mΩ	V_{GS}=4.5V, I_D=3A
		-	-	70		V_{GS}=2.5V, I_D=2A
		-	-	85		V_{GS}=1.8V, I_D=1A
Total Gate Charge[2]	Q_g	-	7	12	nC	I_D=3A V_{DS}=10V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	0.6	-		
Gate-Drain ("Miller") Change	Q_{gd}	-	2	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	6	-	ns	V_{DS}=10V I_D=1A V_{GS}=5V R_G=3.3Ω R_D=10Ω
Rise Time	T_r	-	11	-		
Turn-off Delay Time	$T_{d(off)}$	-	17	-		
Fall Time	T_f	-	3	-		
Input Capacitance	C_{iss}	-	360	580	pF	V_{GS}=0V V_{DS}=15V f=1.0MHz
Output Capacitance	C_{oss}	-	50	-		
Reverse Transfer Capacitance	C_{rss}	-	40	-		
Gate Resistance	R_g	-	1.4	2.0	Ω	f=1.0MHz

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage[2]	V_{SD}	-	-	1.3	V	I_S=0.9A, V_{GS}=0V

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≦5sec; 180℃/W when mounted on Min. copper pad.

P-Channel Electrical Characteristics (Tj = 25℃ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	-16	-	-	V	V_{GS}=0, I_D=-250uA
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS} / \triangle Tj$	-	0.01	-	V/℃	Reference to 25℃, I_D=-1mA
Gate Threshold Voltage	$V_{GS(th)}$	-0.2	-	-1.0	V	V_{DS}=V_{GS}, I_D=-250uA
Forward Transconductance	g_{fs}	-	5	-	S	V_{DS}=-5V, I_D=-2A
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ± 8V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	-1	uA	V_{DS}=-16V, V_{GS}=0
Drain-Source Leakage Current(Tj=70℃)		-	-	-25	uA	V_{DS}=-12V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	-	125	mΩ	V_{GS}=-4.5V, I_D=-2A
		-	-	155		V_{GS}=-2.5V, I_D=-1.6A
		-	-	200		V_{GS}=-1.8V, I_D=-1A
Total Gate Charge[2]	Q_g	-	6	10	nC	I_D=-2A V_{DS}=-10V V_{GS}=-4.5V
Gate-Source Charge	Q_{gs}	-	0.8	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	2	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	7	-	ns	V_{DS}=-10V I_D=-1A V_{GS}=-5V R_G=3.3Ω R_D=10Ω
Rise Time	T_r	-	20	-		
Turn-off Delay Time	$T_{d(off)}$	-	23	-		
Fall Time	T_f	-	24	-		
Input Capacitance	C_{iss}	-	370	600	pF	V_{GS}=0V V_{DS}=-15V f=1.0MHz
Output Capacitance	C_{oss}	-	70	-		
Reverse Transfer Capacitance	C_{rss}	-	60	-		
Gate Resistance	R_g	-	8	12	Ω	f=1.0MHz

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage[2]	V_{SD}	-	-	-1.3	V	I_S=-0.9A, V_{GS}=0V

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≦5sec; 180℃/W when mounted on Min. copper pad.

Characteristics Curve N-Channel

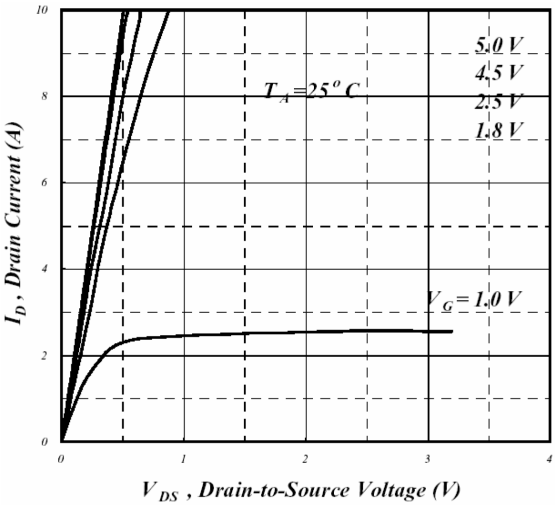


Fig 1. Typical Output Characteristics

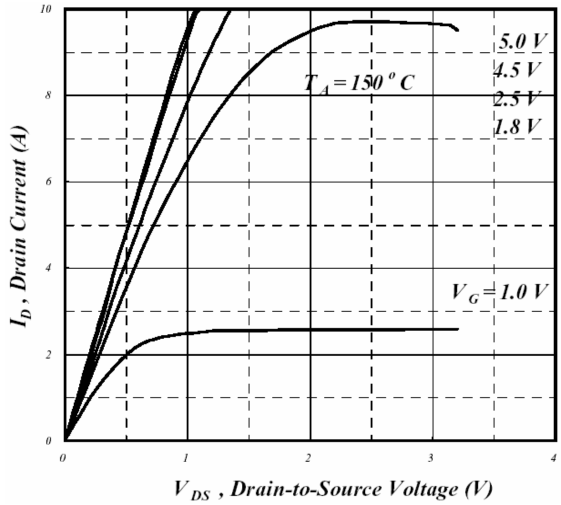


Fig 2. Typical Output Characteristics

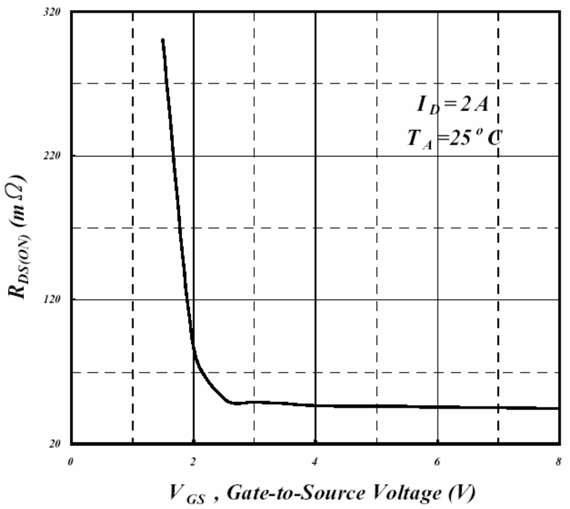


Fig 3. On-Resistance v.s. Gate Voltage

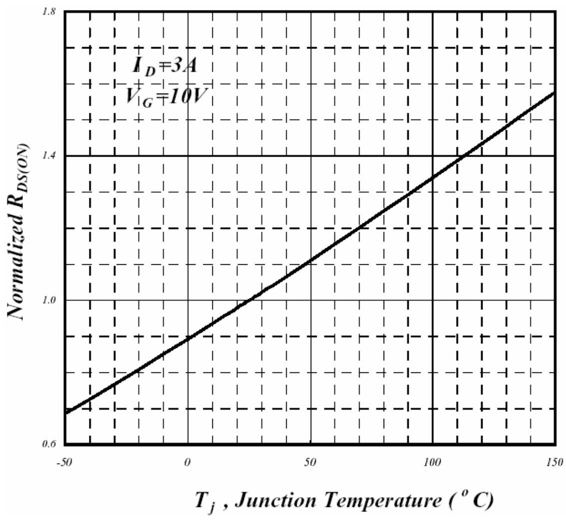


Fig 4. Normalized On-Resistance v.s. Junction Temperature

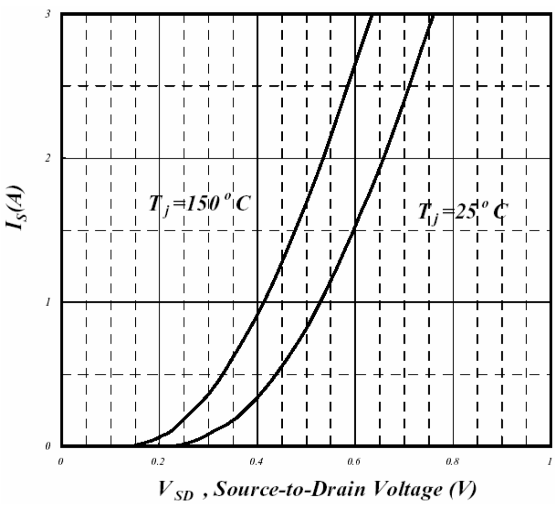


Fig 5. Forward Characteristics of Reverse Diode

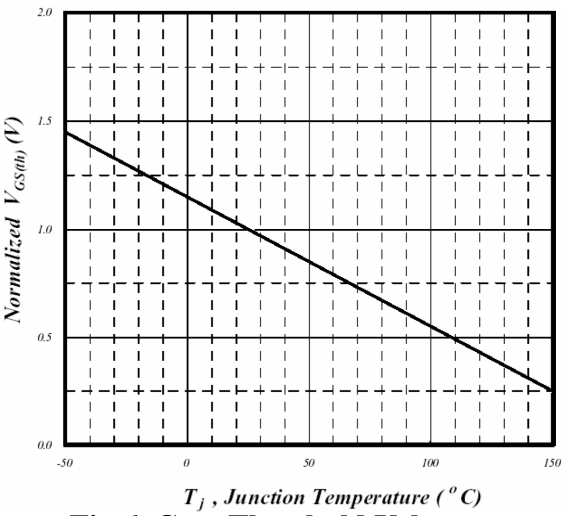


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-Channel

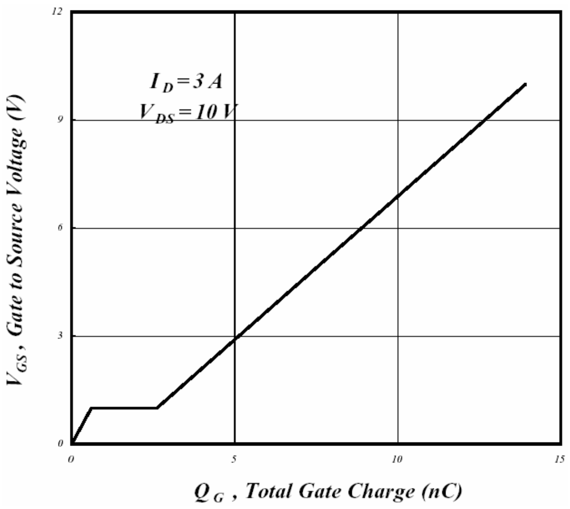


Fig 7. Gate Charge Characteristics

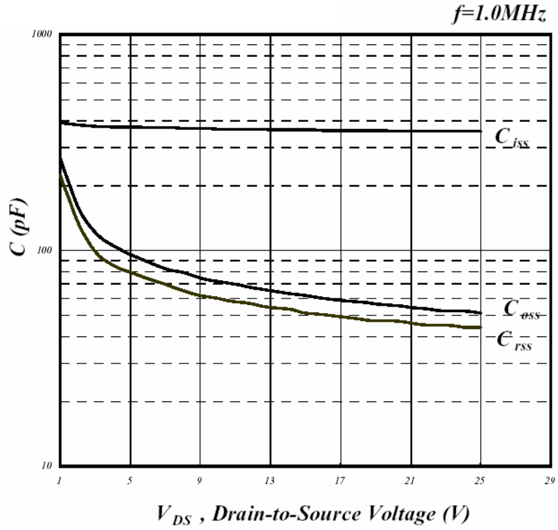


Fig 8. Typical Capacitance Characteristics

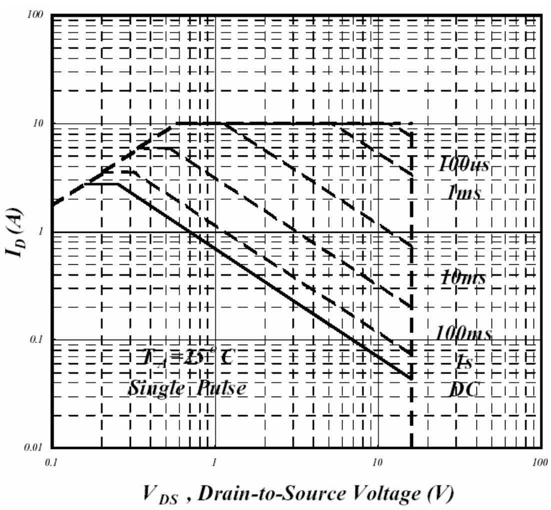


Fig 9. Maximum Safe Operating Area

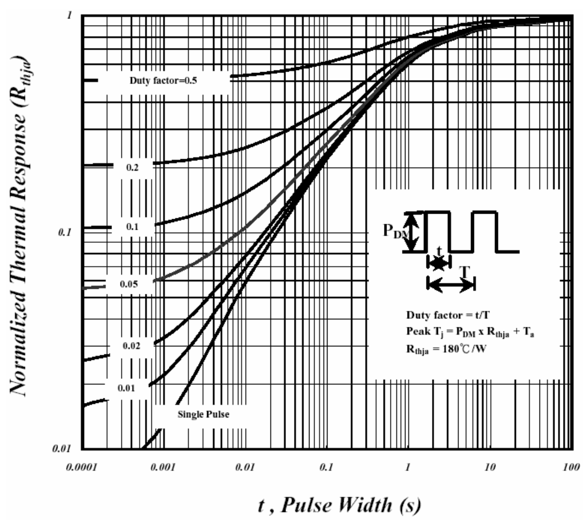


Fig 10. Effective Transient Thermal Impedance

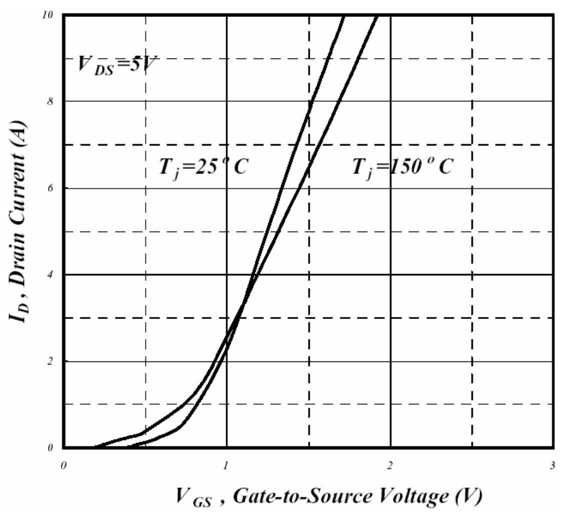


Fig 11. Transfer Characteristics

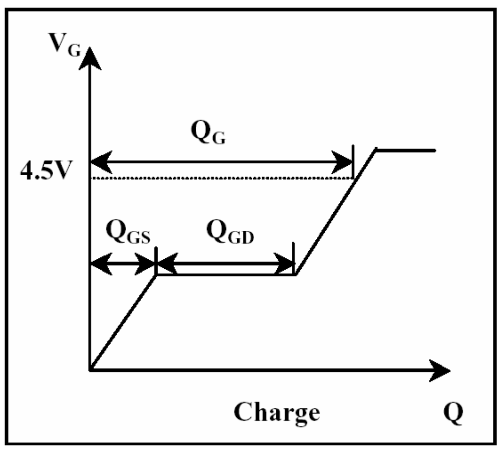


Fig 12. Gate Charge Waveform

P-Channel

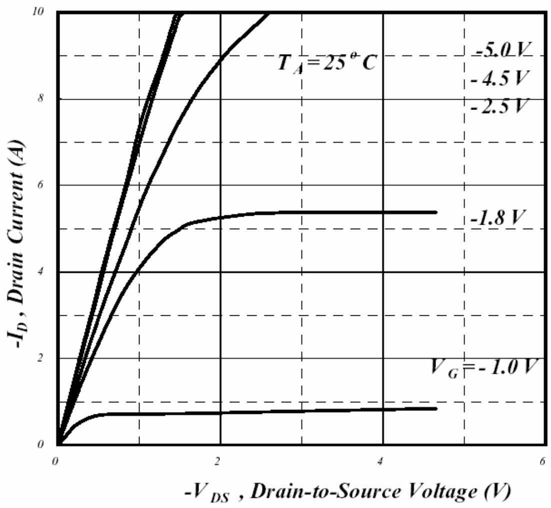


Fig 1. Typical Output Characteristics

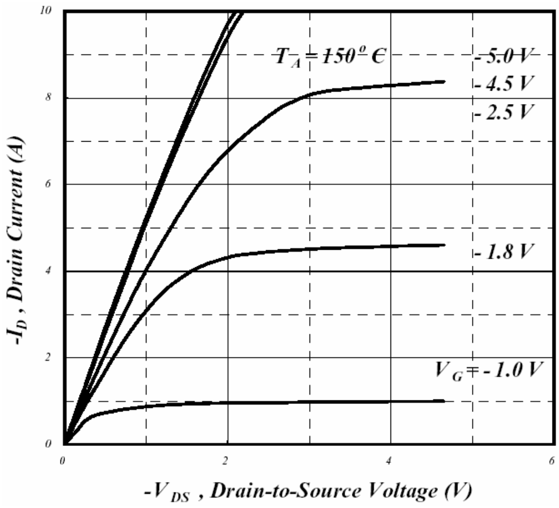


Fig 2. Typical Output Characteristics

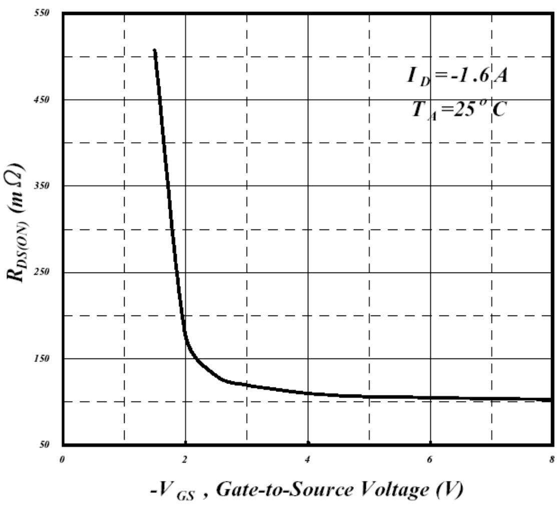


Fig 3. On-Resistance v.s. Gate Voltage

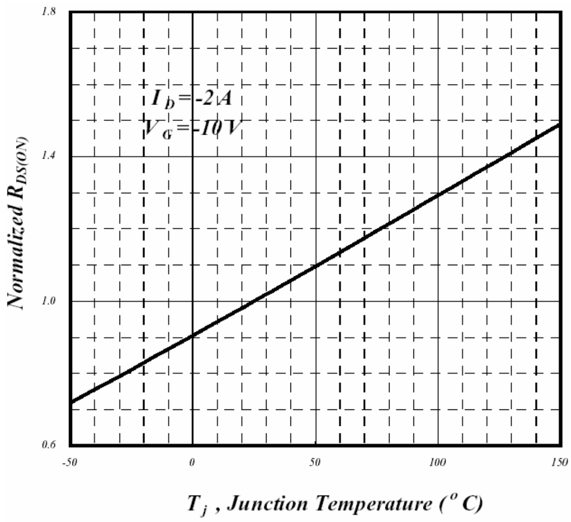


Fig 4. Normalized On-Resistance v.s. Junction Temperature

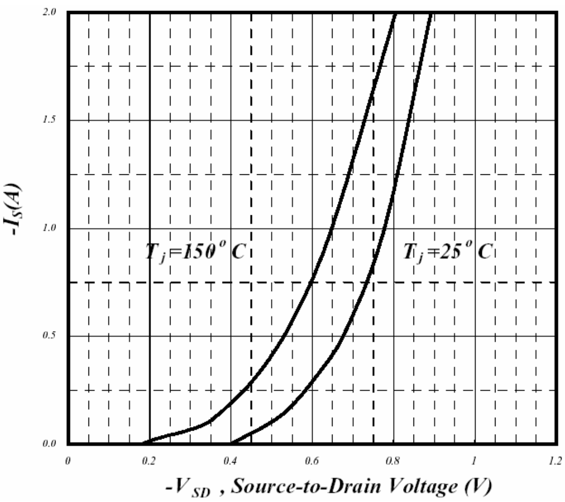


Fig 5. Forward Characteristics of Reverse Diode

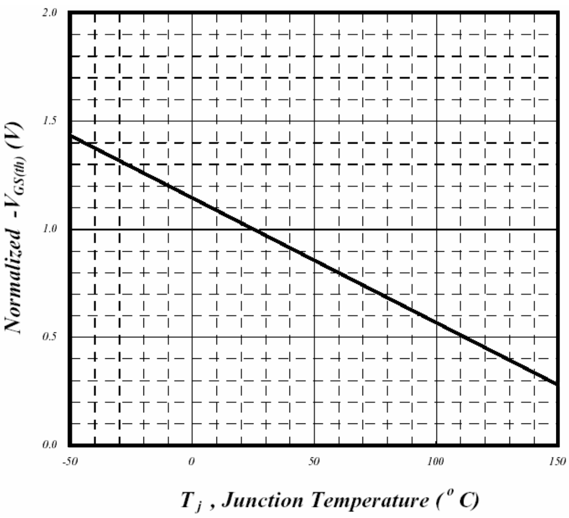


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

P-Channel

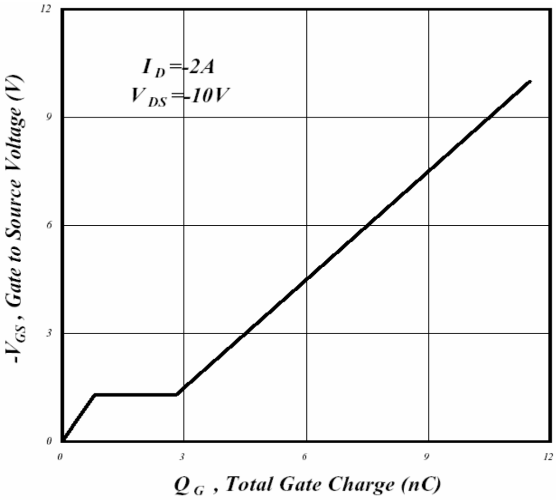


Fig 7. Gate Charge Characteristics

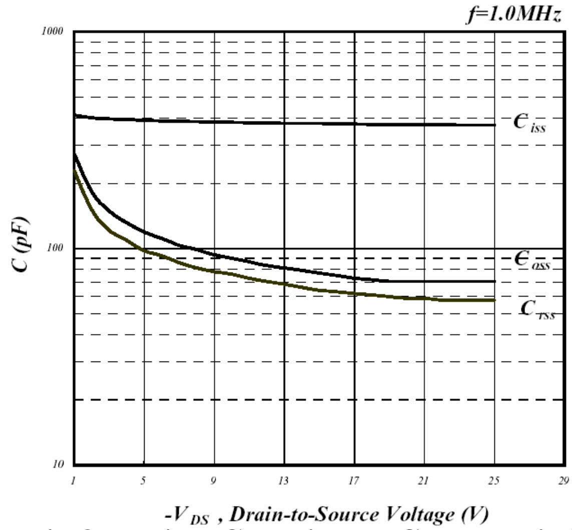
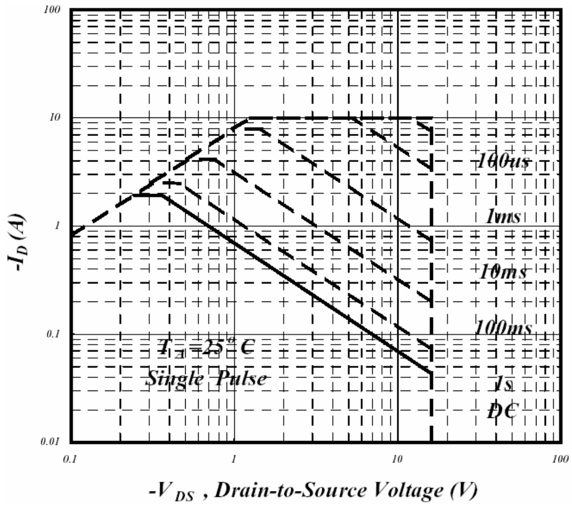


Fig 8. Typical Capacitance Characteristics



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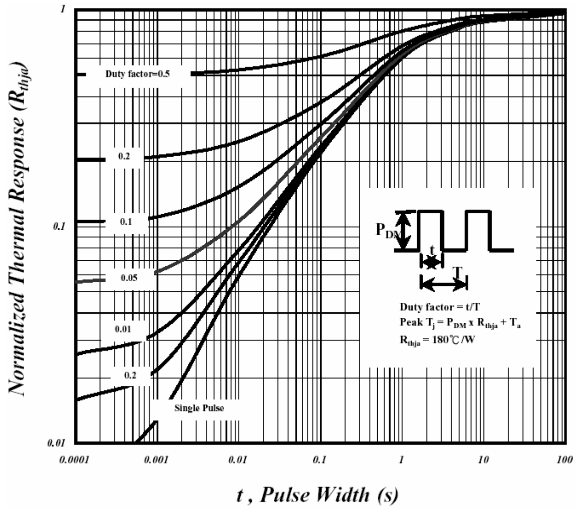

Fig 10. Effective Transient Thermal Impedance

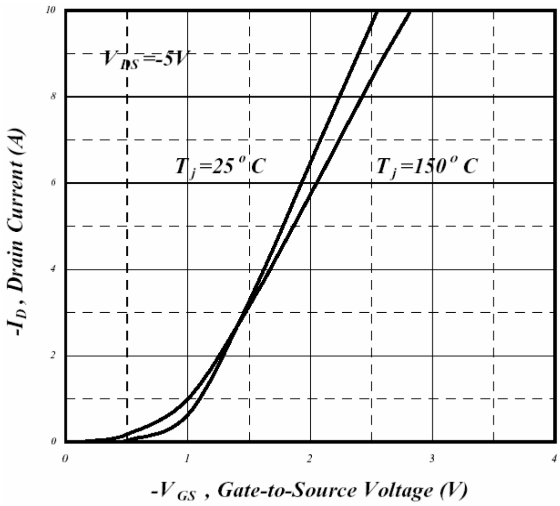

Fig 11. Transfer Characteristics

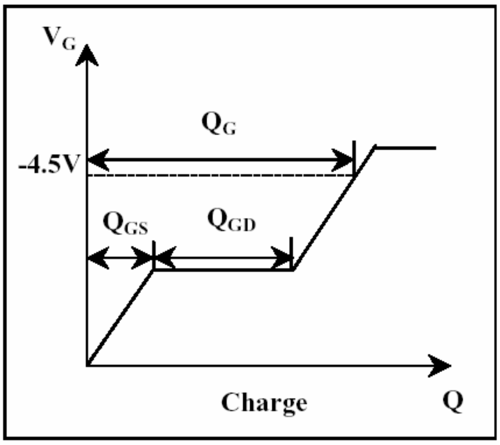

Fig 12. Gate Charge Waveform

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