

GT3585

N AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

N-CH BV_{DSS}	20V
$R_{DS(ON)}$	75m Ω
I_D	3.5A
P-CH BV_{DSS}	-20V
$R_{DS(ON)}$	160m Ω
I_D	-2.5A

Description

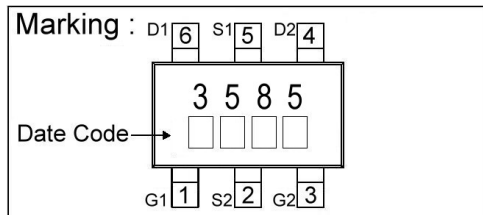
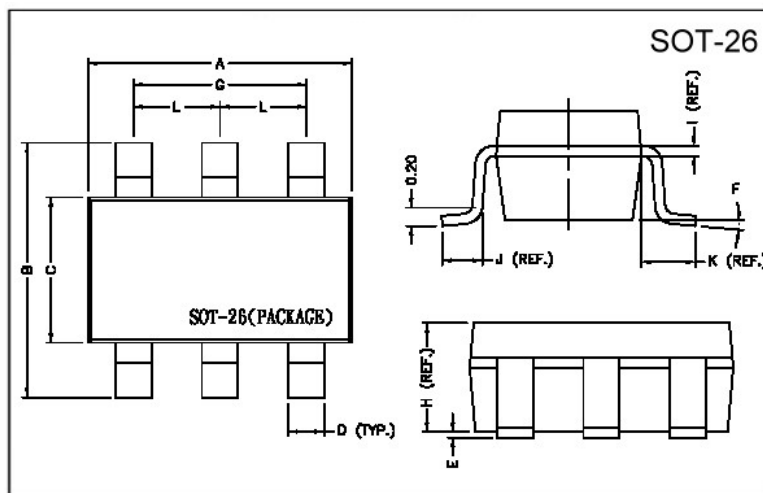
The GT3585 provide the designer with best combination of fast switching, low on-resistance and cost-effectiveness.

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}	20	-20	V
Gate-Source Voltage	V_{GS}	± 12	± 12	V
Continuous Drain Current ³	$I_D @ TA=25^\circ C$	3.5	-2.5	A
Continuous Drain Current ³	$I_D @ TA=70^\circ C$	2.8	-1.97	A
Pulsed Drain Current ¹	I_{DM}	10	-10	A
Total Power Dissipation	$P_D @ TA=25^\circ C$	1.14		W
Linear Derating Factor		0.01		W/ $^\circ C$
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150		$^\circ C$

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient ³ Max.	R_{thj-a}	110	$^\circ C/W$

N-Channel Electrical Characteristics (T_j = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	$V_{GS}=0, I_D=250\mu A$
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.02	-	V/°C	Reference to 25°C, $I_D=1mA$
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	1.2	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	g_{fs}	-	7	-	S	$V_{DS}=5V, I_D=3A$
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	$V_{GS}= \pm 12V$
Drain-Source Leakage Current(T _j =25°C)	I_{DSS}	-	-	1	uA	$V_{DS}=20V, V_{GS}=0$
Drain-Source Leakage Current(T _j =70°C)		-	-	10	uA	$V_{DS}=16V, V_{GS}=0$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	75	mΩ	$V_{GS}=4.5V, I_D=3.5A$
		-	-	125		$V_{GS}=2.5V, I_D=1.2A$
Total Gate Charge ²	Q_g	-	4	7	nC	$I_D=3A$ $V_{DS}=16V$ $V_{GS}=4.5V$
Gate-Source Charge	Q_{gs}	-	0.7	-		
Gate-Drain ("Miller") Charge	Q_{gd}	-	2	-		
Turn-on Delay Time ²	$T_{d(on)}$	-	6	-	ns	$V_{DS}=15V$ $I_D=1A$ $V_{GS}=5V$ $R_G=3.3\Omega$ $R_D=15\Omega$
Rise Time	T_r	-	8	-		
Turn-off Delay Time	$T_{d(off)}$	-	10	-		
Fall Time	T_f	-	3	-		
Input Capacitance	C_{iss}	-	230	370	pF	$V_{GS}=0V$ $V_{DS}=20V$ $f=1.0MHz$
Output Capacitance	C_{oss}	-	55	-		
Reverse Transfer Capacitance	C_{rss}	-	40	-		
Gate Resistance	R_g	-	1.1	1.7	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	T_{rr}	-	16	-	ns	$I_S=3A, V_{GS}=0V$ $di/dt=100A/\mu s$
Reverse Recovery Charge	Q_{rr}	-	8	-	nC	

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

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in² copper pad of FR4 board, t ≤ 5sec; 180°C/W when mounted on Min. copper pad.

P-Channel Electrical Characteristics (T_j = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV _{DSS}	-20	-	-	V	V _{GS} =0, I _D =-250uA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	-0.01	-	V/°C	Reference to 25°C, I _D =-1mA
Gate Threshold Voltage	V _{GS(th)}	-	-	-1.2	V	V _{DS} =V _{GS} , I _D =-250uA
Forward Transconductance	g _{fs}	-	4.0	-	S	V _{DS} =-5V, I _D =-2A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±12V
Drain-Source Leakage Current(T _j =25°C)	I _{DSS}	-	-	-1	uA	V _{DS} =-20V, V _{GS} =0
Drain-Source Leakage Current(T _j =70°C)		-	-	-25	uA	V _{DS} =-16V, V _{GS} =0
Static Drain-Source On-Resistance ²	R _{DS(ON)}	-	-	120	mΩ	V _{GS} =-10V, I _D =-2.8A
		-	-	160		V _{GS} =-4.5V, I _D =-2.5A
		-	-	300		V _{GS} =-2.5V, I _D =-2A
Total Gate Charge ²	Q _g	-	5	8	nC	I _D =-2A V _{DS} =-16V V _{GS} =-4.5V
Gate-Source Charge	Q _{gs}	-	1	-		
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} =-10V R _G =3.3Ω R _D =10Ω
Rise Time	T _r	-	17	-		
Turn-off Delay Time	T _{d(off)}	-	16	-		
Fall Time	T _f	-	5	-		
Input Capacitance	C _{iss}	-	270	430	pF	V _{GS} =0V V _{DS} =-20V f=1.0MHz
Output Capacitance	C _{oss}	-	70	-		
Reverse Transfer Capacitance	C _{rss}	-	55	-		

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}	-	20	-	ns	I _S =-2A, 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 in² copper pad of FR4 board, t ≤ 5sec; 180°C/W when mounted on Min. copper pad.

Characteristics Curve N-Channel

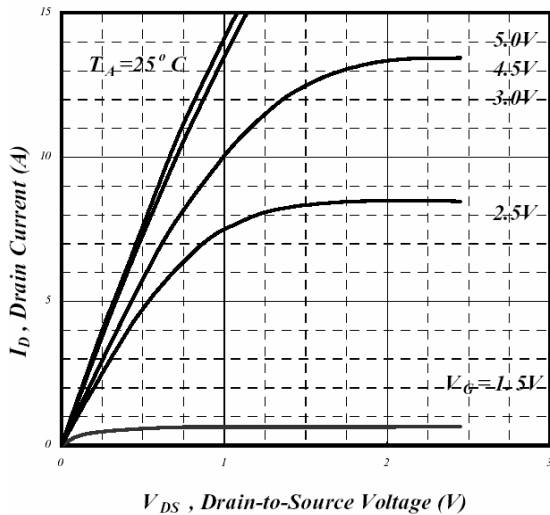


Fig 1. Typical Output Characteristics

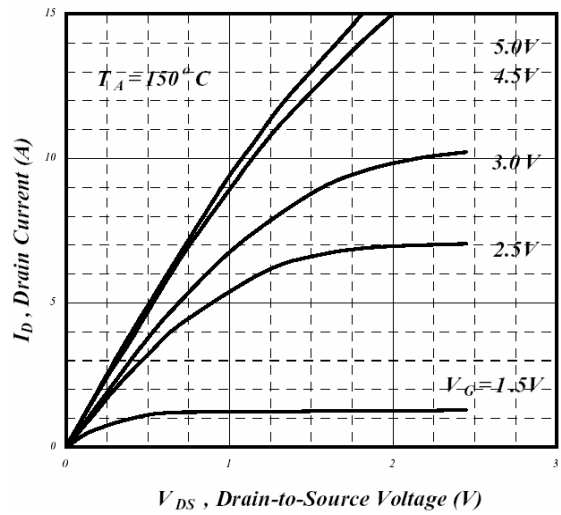


Fig 2. Typical Output Characteristics

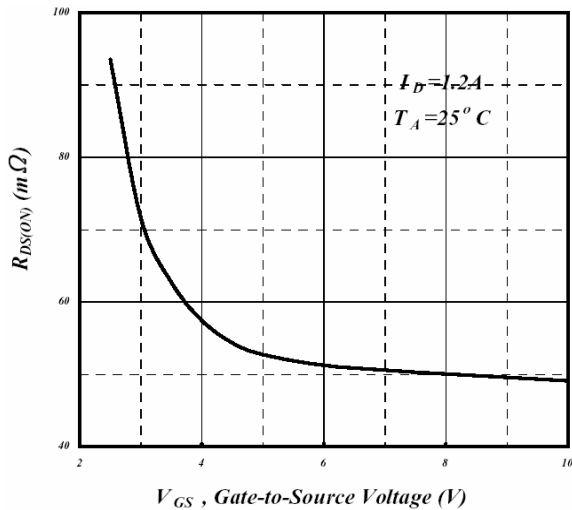


Fig 3. On-Resistance v.s. Gate Voltage

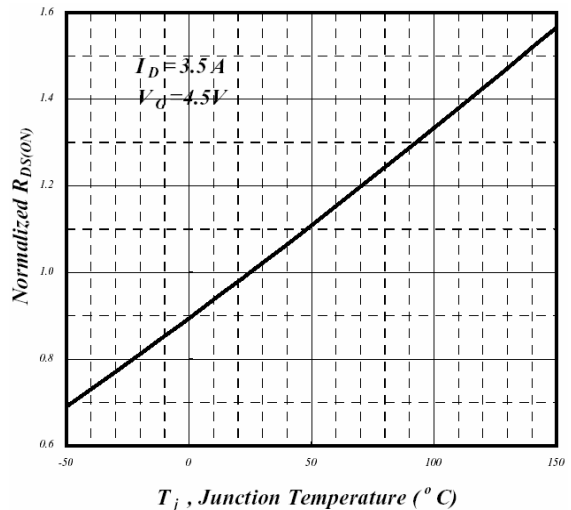


Fig 4. Normalized On-Resistance v.s. Junction Temperature

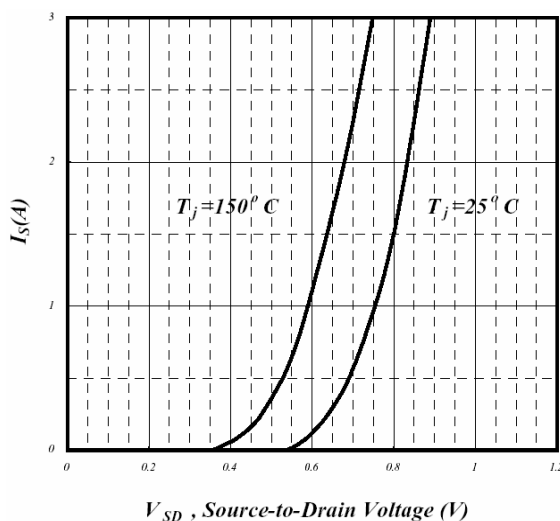


Fig 5. Forward Characteristics of Reverse Diode

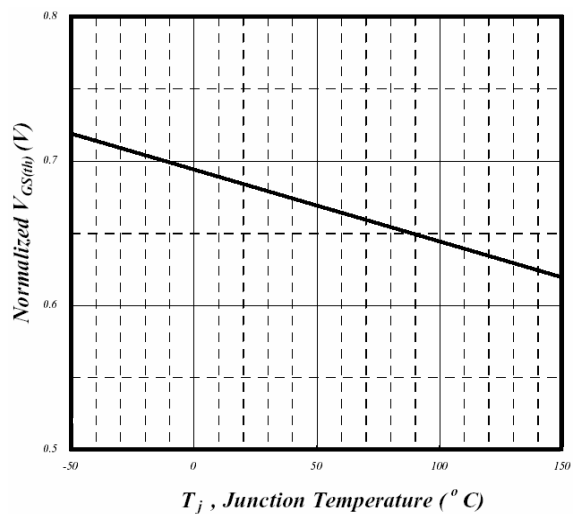


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-Channel

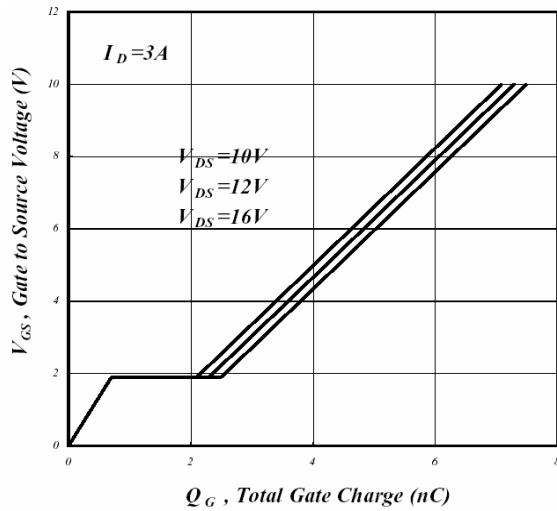


Fig 7. Gate Charge Characteristics

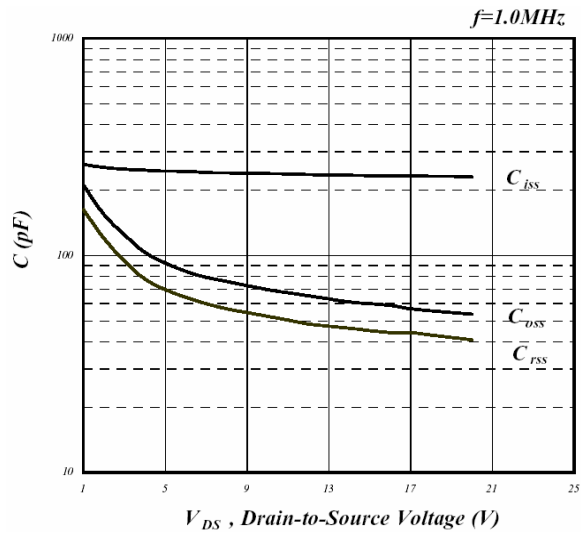


Fig 8. Typical Capacitance Characteristics

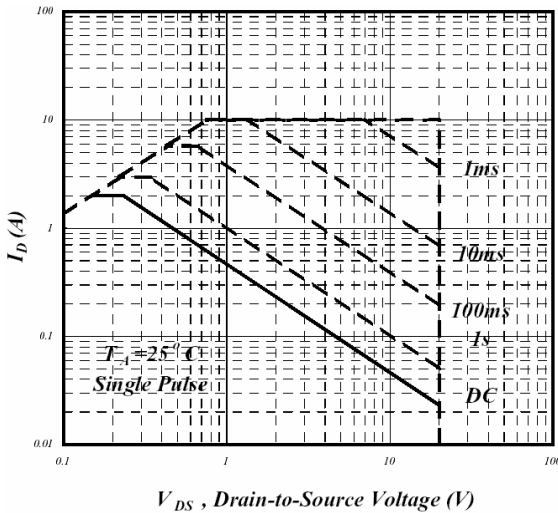


Fig 9. Maximum Safe Operating Area

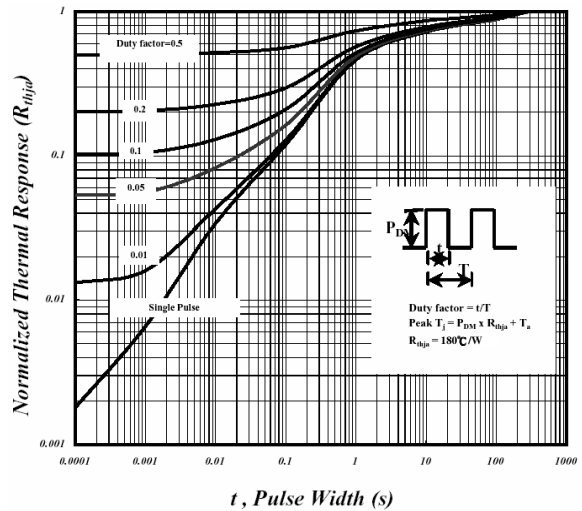


Fig 10. Effective Transient Thermal Impedance

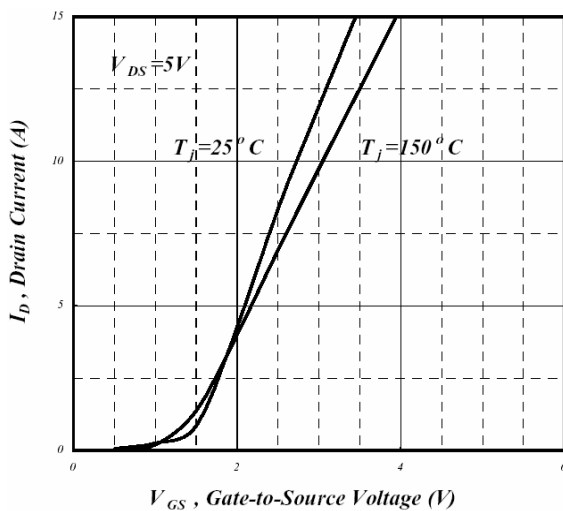


Fig 11. Transfer Characteristics

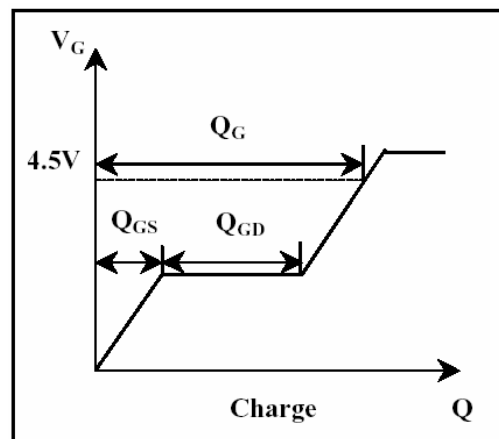


Fig 12. Gate Charge Waveform

P-Channel

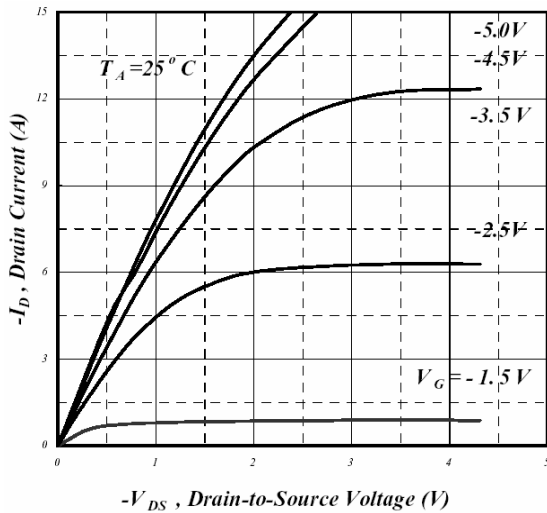


Fig 1. Typical Output Characteristics

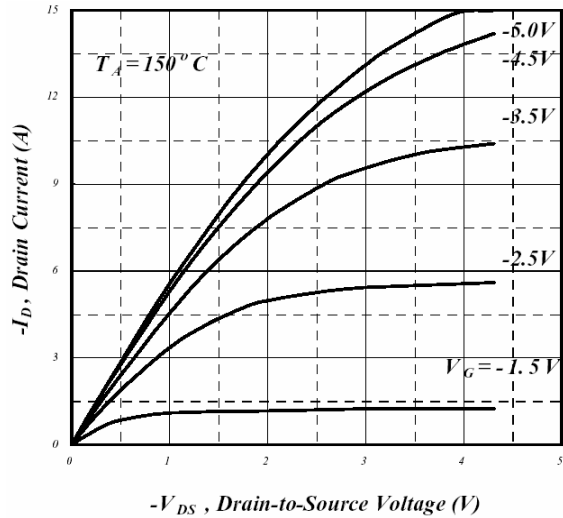


Fig 2. Typical Output Characteristics

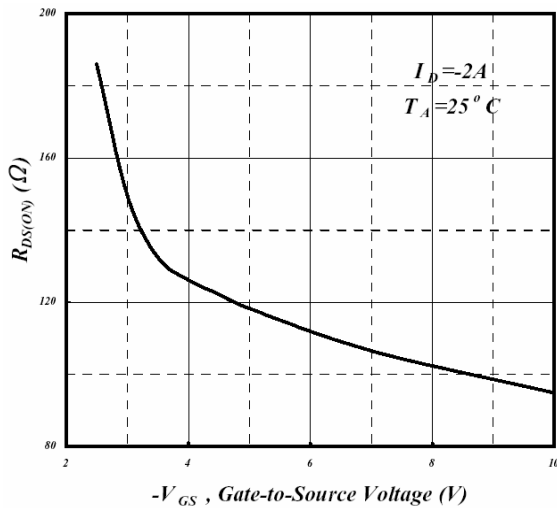


Fig 3. On-Resistance v.s. Gate Voltage

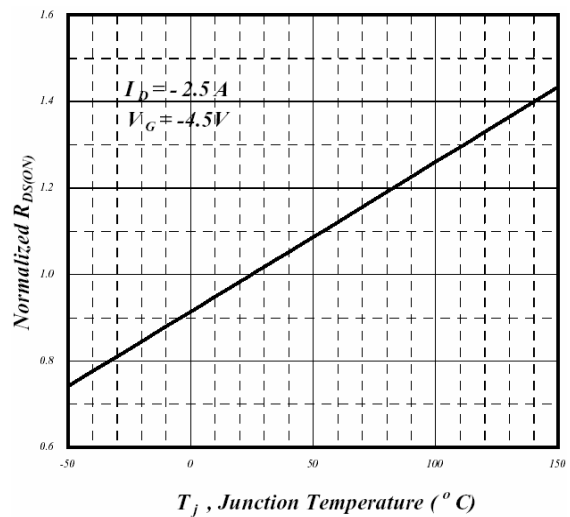


Fig 4. Normalized On-Resistance v.s. Junction Temperature

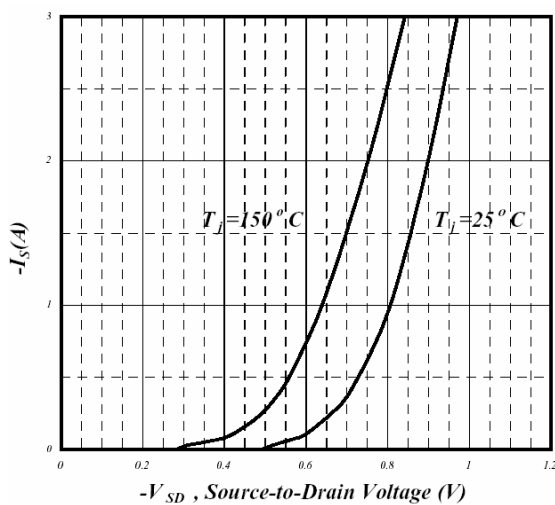


Fig 5. Forward Characteristics of Reverse Diode

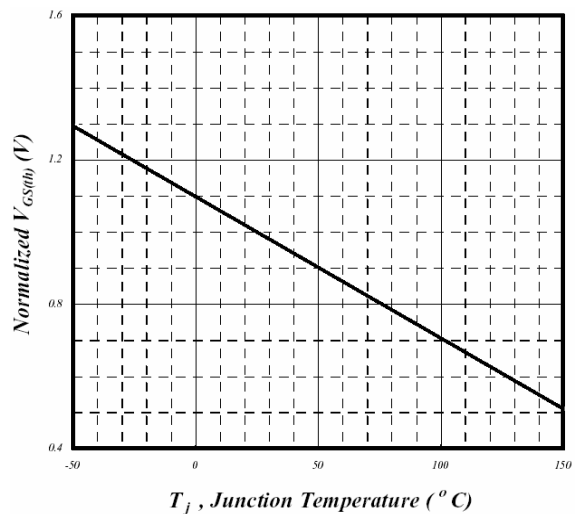


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

P-Channel

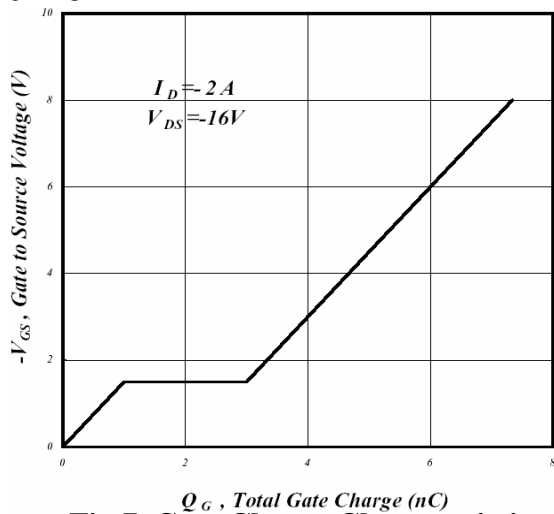


Fig 7. Gate Charge Characteristics

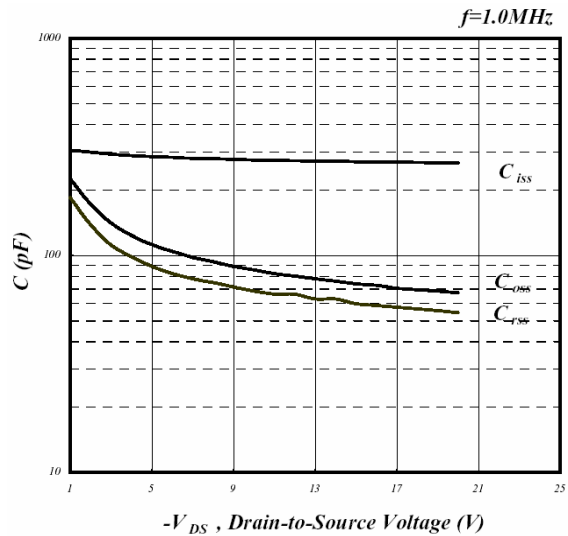


Fig 8. Typical Capacitance Characteristics

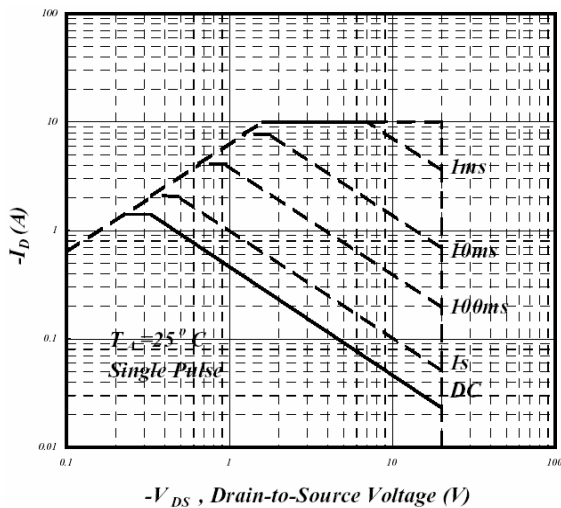


Fig 9. Maximum Safe Operating Area

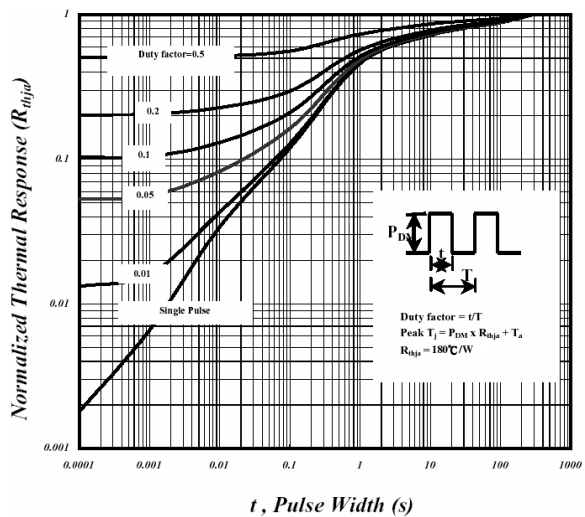


Fig 10. Effective Transient Thermal Impedance

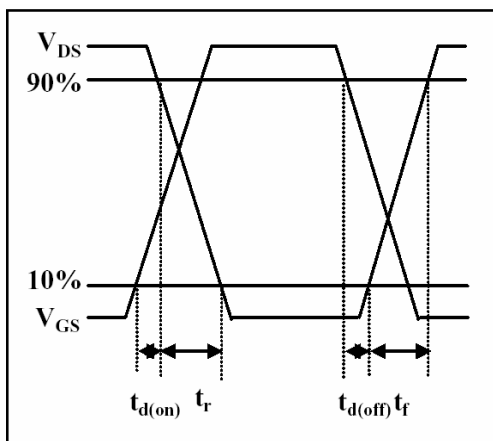


Fig 11. Switching Time Waveform

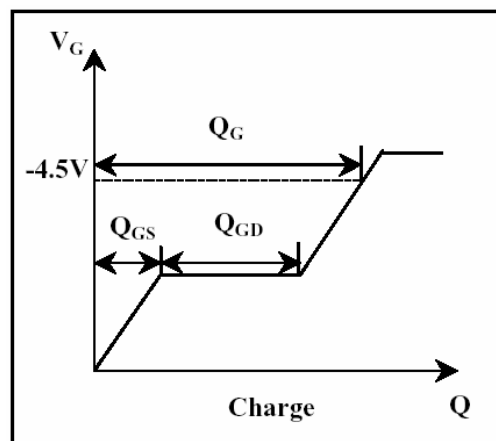


Fig 12. Gate Charge Waveform

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