Elektronische Bauelemente

SSG4575

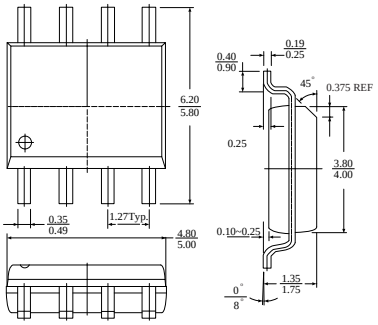
N Channel 6A, 60V, $R_{DS(ON)}$ 36mΩ

P Channel -4.2A, -60V, $R_{DS(ON)}$ 72mΩ

Enhancement Mode Power Mos.FET

RoHS Compliant Product

SOP-8



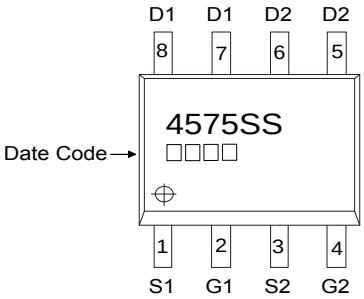
Dimensions in millimeters

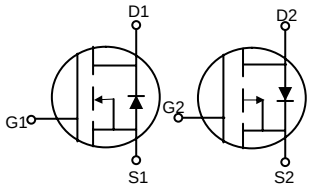
Description

The SSG4575 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 application and suited for low voltage applications such as DC/DC converters.

Features

* Simple Drive Requirement
* Lower On-resistance
* Fast Switching Performance





Absolute Maximum Ratings

Parameter	Symbol	Ratings		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	60	-60	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current [3]	I_D@T_A=25°C	6	-4.2	A
Continuous Drain Current [3]	I_D@T_A=70°C	4.7	-3.3	A
Pulsed Drain Current [1]	I_{DM}	30	-30	A
Total Power Dissipation	P_D@T_A=25°C	2		W
Linear Derating Factor		0.016		W/°C
Operating Junction and Storage Temperature Range	Tj, Tstg	-55~+150		°C

Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient [3]	Rthj-a	62.5	°C/W

Electrical Characteristics N Channel(Tj=25°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV_{DSS}	60	–	–	V	V_{GS}=0V, I_D=250uA
Breakdown Voltage Temp. Coefficient	$\triangle BV_{DS}/\triangle Tj$	–	0.04	–	V/°C	Reference to 25°C, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	1.0	–	3.0	V	V_{DS}=V_{GS}, I_D=250uA
Gate-Source Leakage Current	I_{GSS}	–	–	±100	nA	V_{GS}=±20V
Drain-Source Leakage Current (Tj=25℃)	I_{DSS}	–	–	1	uA	V_{DS}=60V,V_{GS}=0
Drain-Source Leakage Current (Tj=70℃)		–	–	25	uA	V_{DS}=48V,V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	–	–	36	mΩ	V_{GS}=10V, I_D=5A
		–	–	42		V_{GS}=4.5V, I_D=3A
Total Gate Charge[2]	Qg	–	18	29	nC	I_D=5A V_{DS}=48V V_{GS}=4.5V
Gate-Source Charge	Qgs	–	5	–		
Gate-Drain ("Miller") Charge	Qgd	–	10	–		
Turn-on Delay Time[2]	$Td_{(ON)}$	–	10	–	nS	V_{DD}=30V I_D=1A V_{GS}=10V R_G=3.3Ω R_D=30 Ω
Rise Time	Tr	–	6	–		
Turn-off Delay Time	$Td_{(Off)}$	–	32	–		
Fall Time	T_f	–	10	–		
Input Capacitance	Ciss	–	1670	2670	pF	V_{GS}=0V V_{DS}=25V f=1.0MHz
Output Capacitance	Coss	–	160	–		
Reverse Transfer Capacitance	Crss	–	117	–		
Forward Transconductance	Gfs	–	8	–	S	V_{DS}=10V, I_D=4A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage[2]	V_{DS}	–	–	1.2	V	I_S=1.7A, V_{GS}=0V.
Reverse Recovery Time[2]	Trr	–	34	–	nS	Is= 5A, V_{GS}=0V dl/dt=100A/uS
Reverse Recovery Charge	Qrr	–	48	–	nC	

Notes: 1.Pulse width limited by Max. junction temperature.
2.Pulse width≦300us, dutycycle≦2%.
3.Surface mounted on 1 in² copper pad of FR4 board; 135°C/W when mounted on Min. copper pad.

Electrical Characteristics P-Channel(Tj=25°C Unless otherwise specified)

Parameter	Symbo	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV_{DSS}	-60	–	–	V	V_{GS}=0V, I_D=-250uA
Breakdown Voltage Temp. Coefficient	$\triangle BV_{DS}/\triangle Tj$	–	-0.04	–	V/°C	Reference to 25°C, I_D=-1mA
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	–	-3.0	V	V_{DS}=V_{GS}, I_D=-250uA
Gate-Source Leakage Current	I_{GSS}	–	–	±100	nA	V_{GS}=±20V
Drain-Source Leakage Current (Tj=25°C)	I_{DSS}	–	–	-1	uA	V_{DS}=-60V,V_{GS}=0
Drain-Source Leakage Current (Tj=70°C)		–	–	-25	uA	V_{DS}=-48V,V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	–	–	72	mΩ	V_{GS}=-10V, I_D=-4A
		–	–	88		V_{GS}=-4.5V, I_D=-3A
Total Gate Charge[2]	Qg	–	21	34	nC	I_D=-4A V_{DS}=-48V V_{GS}=-4.5V
Gate-Source Charge	Qgs	–	5	–		
Gate-Drain ("Miller") Charge	Qgd	–	9	–		
Turn-on Delay Time[2]	$Td_{(ON)}$	–	12	–	nS	V_{DS}=-30V I_D=-1A V_{GS}=-10V R_G=3.3Ω R_D=30Ω
Rise Time	Tr	–	6	–		
Turn-off Delay Time	$Td_{(Off)}$	–	82	–		
Fall Time	T_f	–	36	–		
Input Capacitance	Ciss	–	1780	2850	pF	V_{GS}=0V V_{DS}=-25V f=1.0MHz
Output Capacitance	Coss	–	157	–		
Reverse Transfer Capacitance	Crss	–	130	–		
Forward Transconductance	Gfs	–	6	–	S	V_{DS}=-10V, I_D=-4A

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage[2]	V_{DS}	–	–	-1.2	V	I_S=-1.7A, V_{GS}=0V.
Reverse Recovery Time[2]	Trr	–	43	–	nS	Is=-4A, V_{GS}=0V dI/dt=100A/uS
Reverse Recovery Charge	Qrr	–	87	–	nC	

Notes: 1.Pulse width limited by Max. junction temperature.
2.Pulse width≦300us, dutycycle≦2%.
3.Surface mounted on 1 in² copper pad of FR4 board; 135°C/W when mounted on Min. copper pad.

Characteristics Curve N-Channel

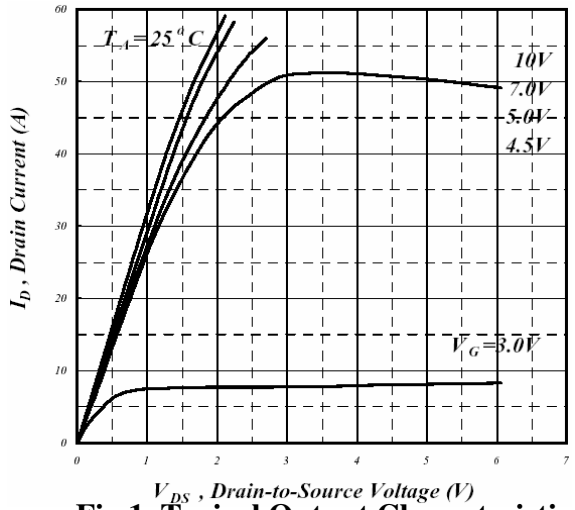


Fig 1. Typical Output Characteristics

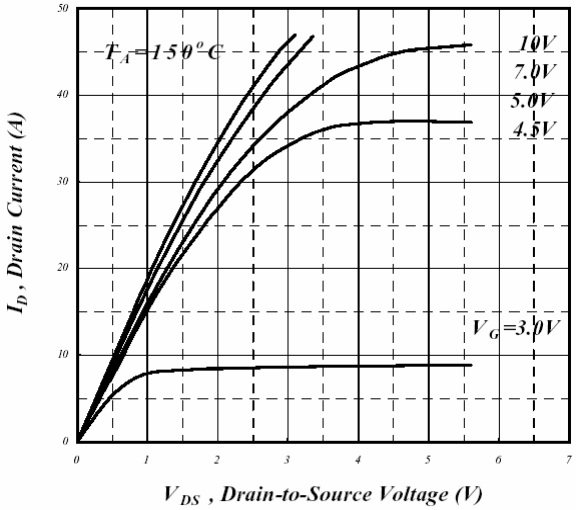


Fig 2. Typical Output Characteristics

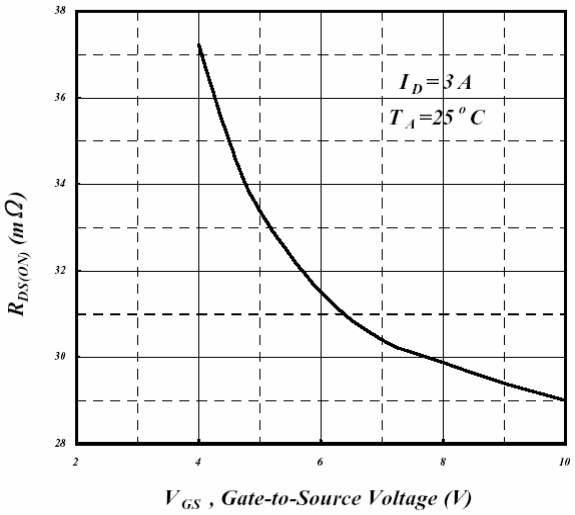


Fig 3. On-Resistance v.s. Gate Voltage

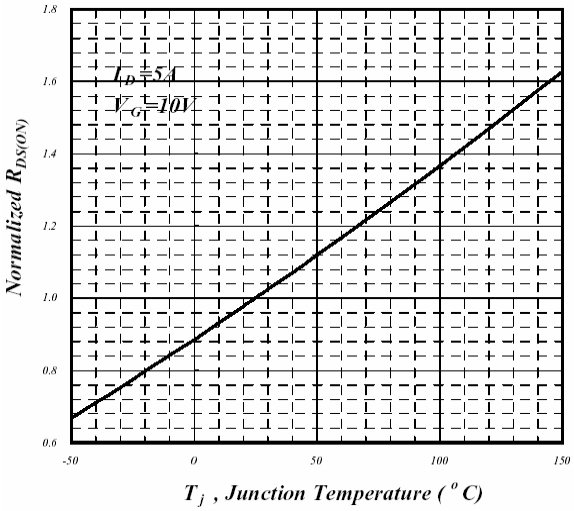


Fig 4. Normalized On-Resistance v.s. Junction Temperature

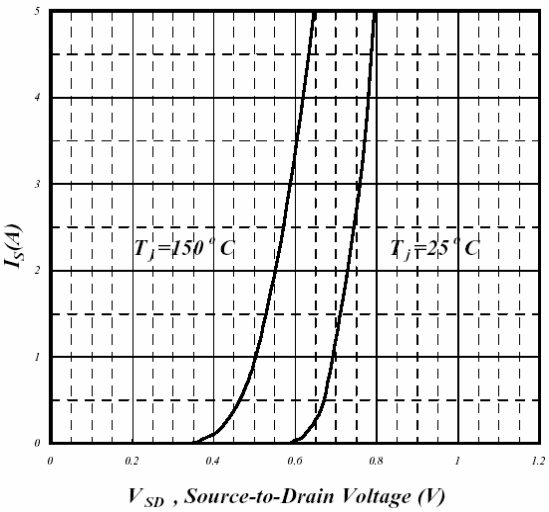


Fig 5. Forward Characteristics of Reverse Diode

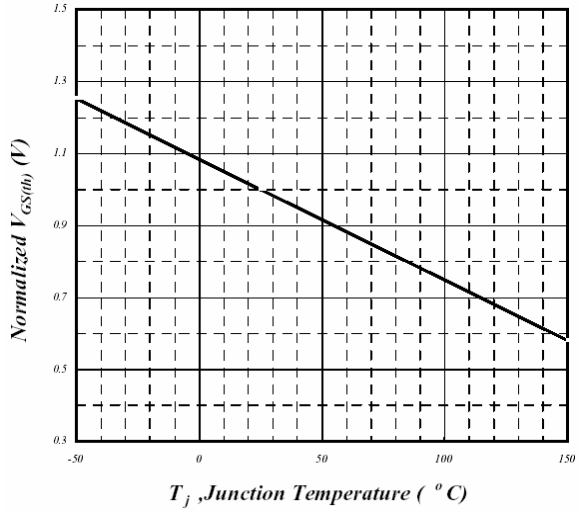


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

N-Channel

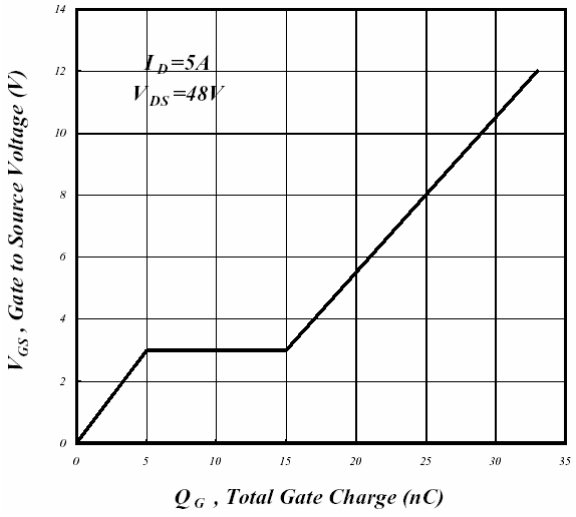


Fig 7. Gate Charge Characteristics

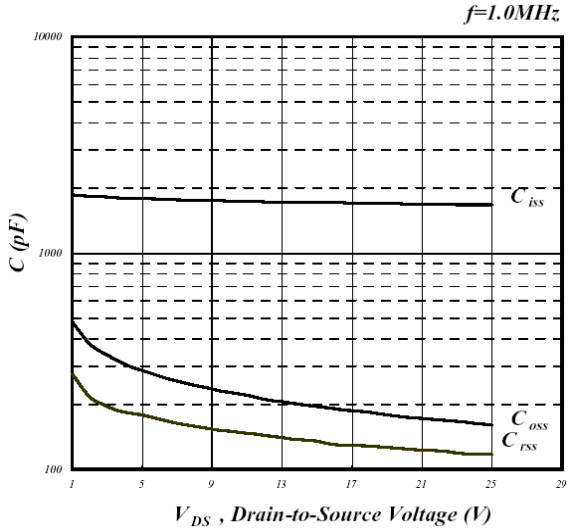


Fig 8. Typical Capacitance Characteristics

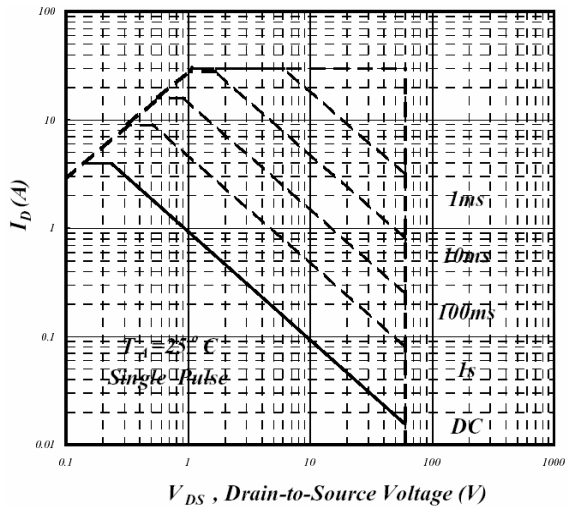


Fig 9. Maximum Safe Operating Area

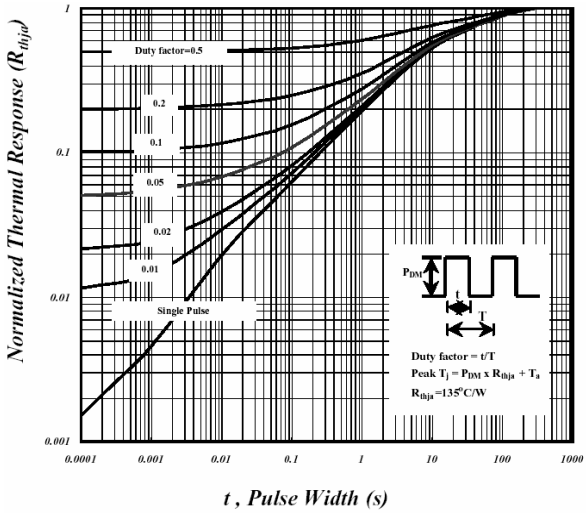


Fig 10. Effective Transient Thermal Impedance

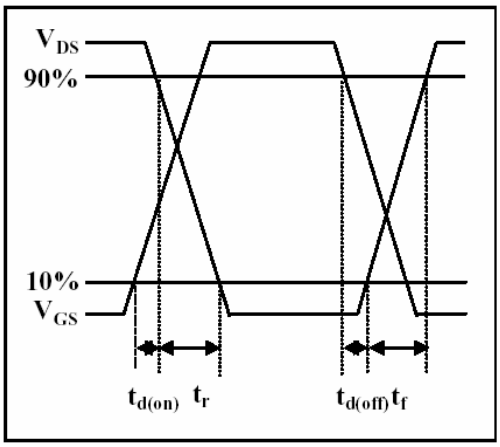


Fig 11. Switching Time Waveform

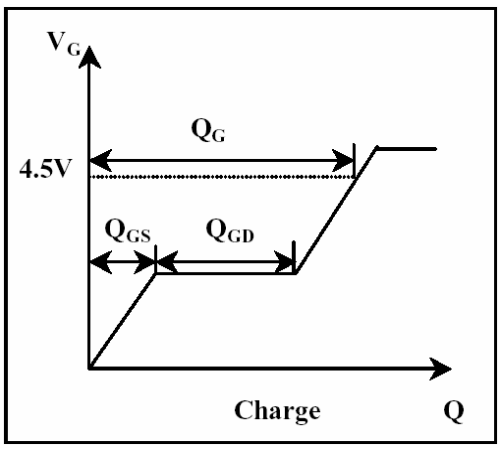


Fig 12. Gate Charge Waveform

P-Channel

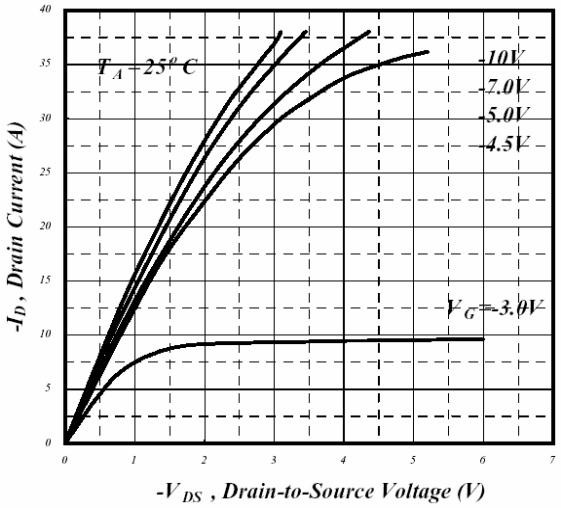


Fig 1. Typical Output Characteristics

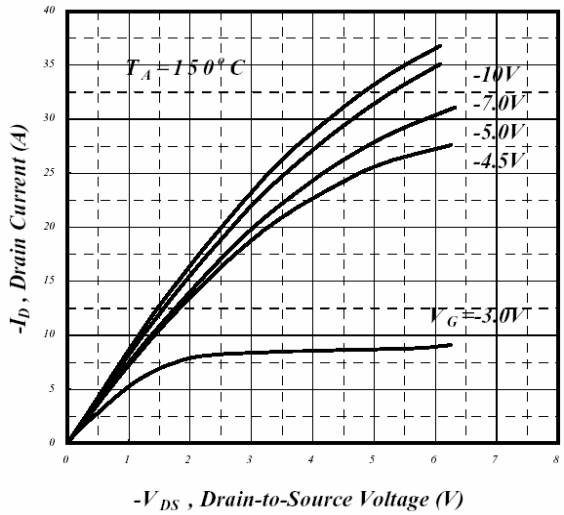


Fig 2. Typical Output Characteristics

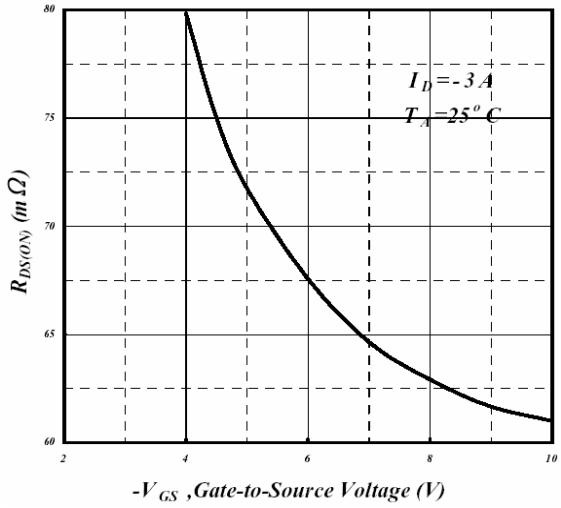


Fig 3. On-Resistance v.s. Gate Voltage

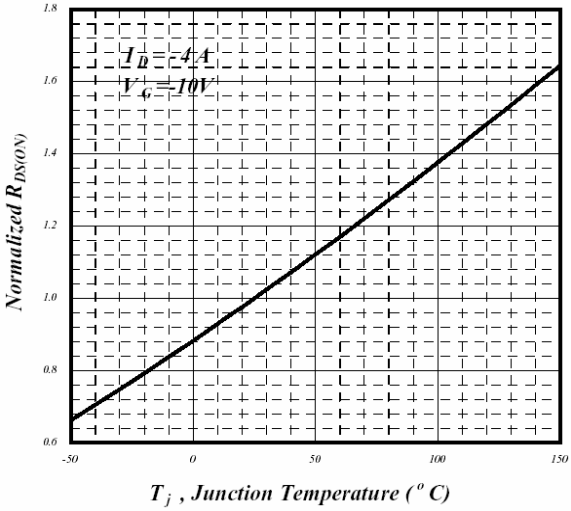


Fig 4. Normalized On-Resistance v.s. Junction Temperature

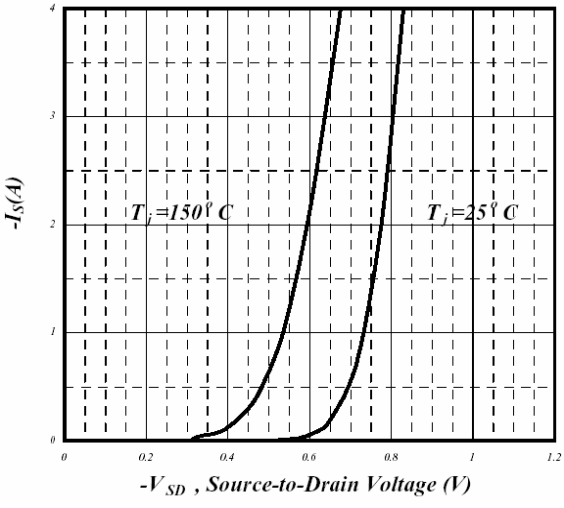


Fig 5. Forward Characteristics of Reverse Diode

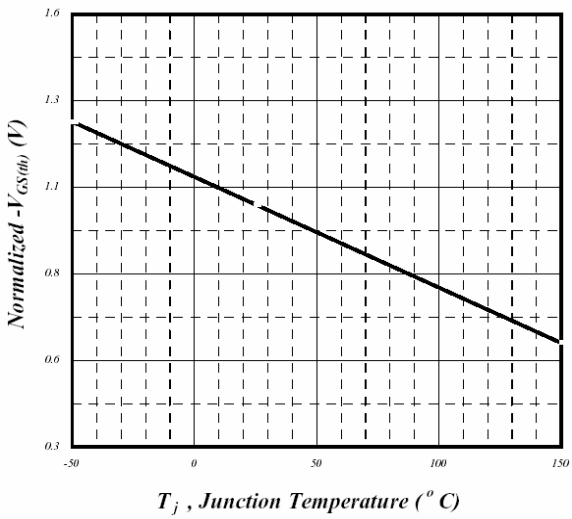


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

P-Channel

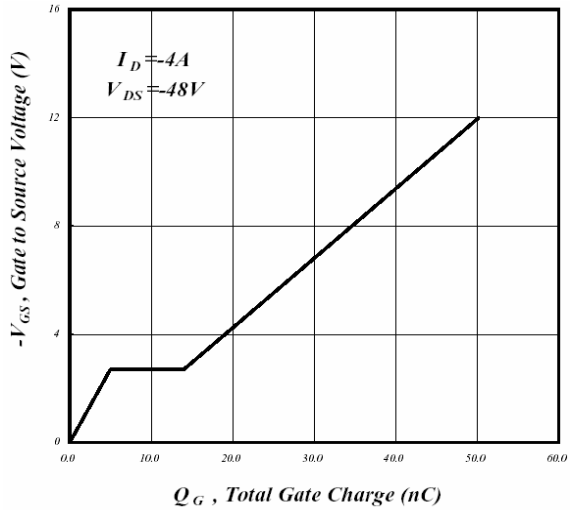


Fig 7. Gate Charge Characteristics

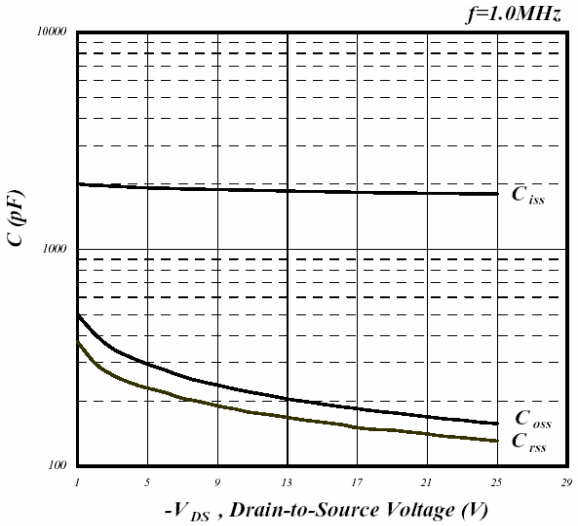
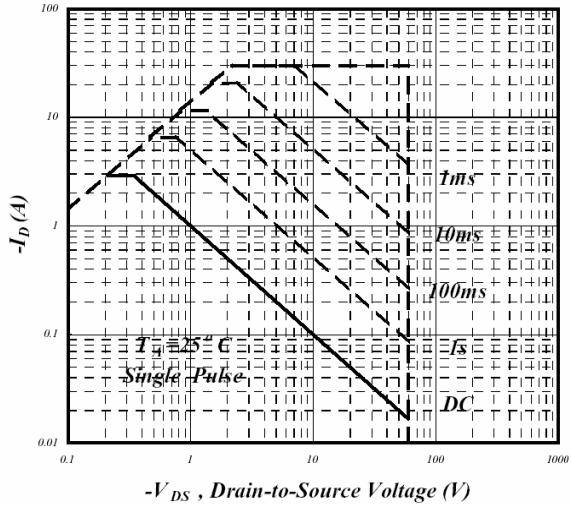


Fig 8. Typical Capacitance Characteristics



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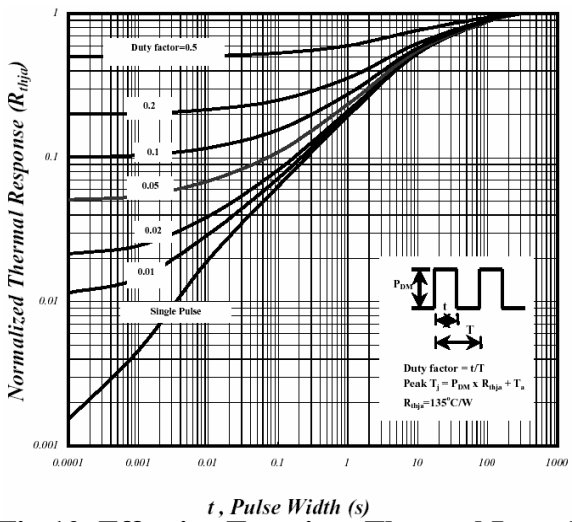

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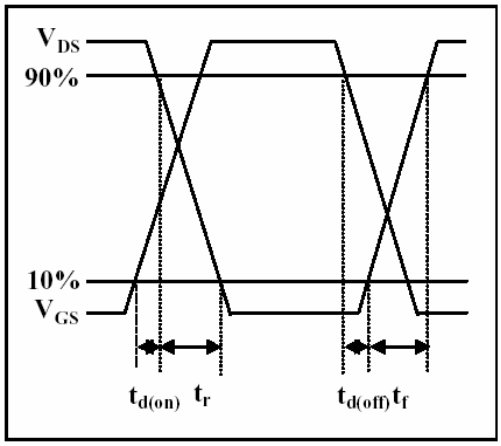

Fig 11. Switching Time Waveform

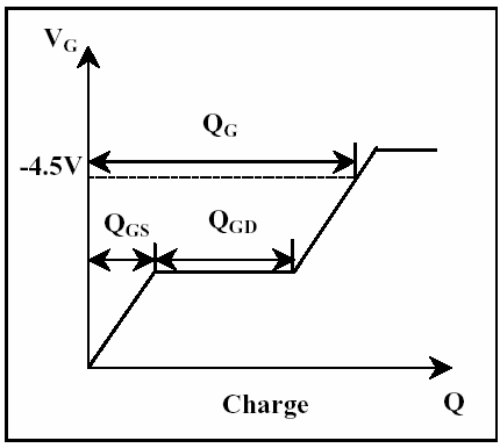

Fig 12. Gate Charge Waveform