

General Description

The MY3G02C uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

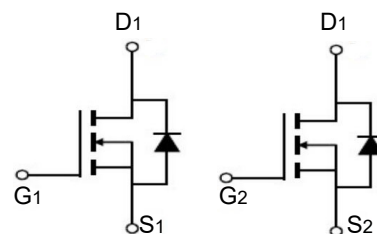
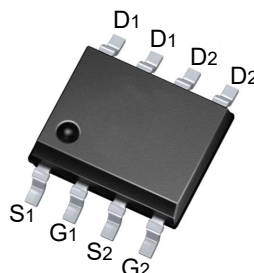


Features

V_{DSS}	20 -20	V
I_D	3 -3	A
$R_{DS(ON)}(at V_{GS}=10V)$	<32	m Ω
$R_{DS(ON)}(at V_{GS}=-10V)$	<75	m Ω

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY3G02C	SOP-8	3G02C	3000

Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
V_{DS}	Drain-Source Voltage	20	-20	V
V_{GS}	Gate-Source Voltage	± 12	± 12	V
$I_D@T_C=25^{\circ}\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	5.8	-3.5	A
$I_D@T_C=100^{\circ}\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	4.9	-2.8	A
I_{DM}	Pulsed Drain Current ²	20	-15	A
$P_D@T_C=25^{\circ}\text{C}$	Total Power Dissipation ⁴	1	1	W
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	$^{\circ}\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	125	125	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	85	95	$^{\circ}\text{C/W}$

N-Channel Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.029	---	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=5.8A$	---	---	27	$m\Omega$
		$V_{GS}=4.5V$, $I_D=5A$	---	---	32	
		$V_{GS}=2.5V$, $I_D=4A$	---	---	40	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.5	---	1.2	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-2.82	---	$mV/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=24V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=5A$	---	25	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1MHz$	---	1.5	---	
Q_g	Total Gate Charge (4.5V)	$V_{DS}=15V$, $V_{GS}=4.5V$, $I_D=5.8A$	---	11.5	---	nC
Q_{gs}	Gate-Source Charge		---	1.6	---	
Q_{gd}	Gate-Drain Charge		---	2.9	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V$, $V_{GS}=10V$, $R_G=3\Omega$ $I_D=5A$	---	5	---	ns
T_r	Rise Time		---	47.	---	
$T_{d(off)}$	Turn-Off Delay Time		---	26	---	
T_f	Fall Time		---	8	---	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $f=1MHz$	---	860	---	pF
C_{oss}	Output Capacitance		---	84	---	
C_{rss}	Reverse Transfer Capacitance		---	70	---	

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, dut
- 3.The power dissipation is limited by 150°C junction temperature
- 4 .The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

P-Channel Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-20	---	---	V
△BVDSS/△T _J	BVDSS Temperature Coefficient	Reference to 25 °C, I _D =-1mA	---	-0.01	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =-4.5V, I _D =-3A	---	60	75	mΩ
		V _{GS} =-2.5V, I _D =-2A	---	85	105	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.5	-0.7	-1.2	V
△VGS(th)	VGS(th) Temperature Coefficient		---	2.98	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =-16V, V _{GS} =0V, T _J =25 °C	---	---	-1	uA
		V _{DS} =-16V, V _{GS} =0V, T _J =55 °C	---	---	-5	
IGSS	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =-5V, I _D =-3A	---	9	---	S
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-5V, V _{GS} =-4.5V, I _D =-3A	---	9.7	13.6	nC
Q _{gs}	Gate-Source Charge		---	2.05	2.9	
Q _{gd}	Gate-Drain Charge		---	2.43	3.4	
Td(on)	Turn-On Delay Time	V _{DD} =-10V, V _{GS} =-4.5V, R _G =3.3 I _D =-3A	---	4.8	9.6	ns
T _r	Rise Time		---	9.6	17.3	
Td(off)	Turn-Off Delay Time		---	52	104	
T _f	Fall Time		---	8.4	16.8	
Ciss	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	686	960	pF
Coss	Output Capacitance		---	90.8	127	
Crss	Reverse Transfer Capacitance		---	80.4	113	
IS	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	-3.1	A
ISM	Pulsed Source Current ^{2,4}		---	---	-15.5	A
VSD	Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25 °C	---	---	-1	V
trr	Reverse Recovery Time	IF=-3A, dI/dt=100A/μs, T _J =25 °C	---	8.4	---	nS
Q _{rr}	Reverse Recovery Charge		---	3.3	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150 °C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

N-Channel Typical Characteristics

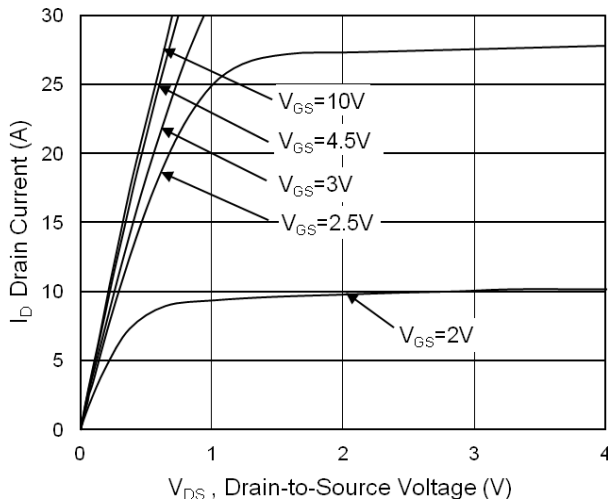


Fig.1 Typical Output Characteristics

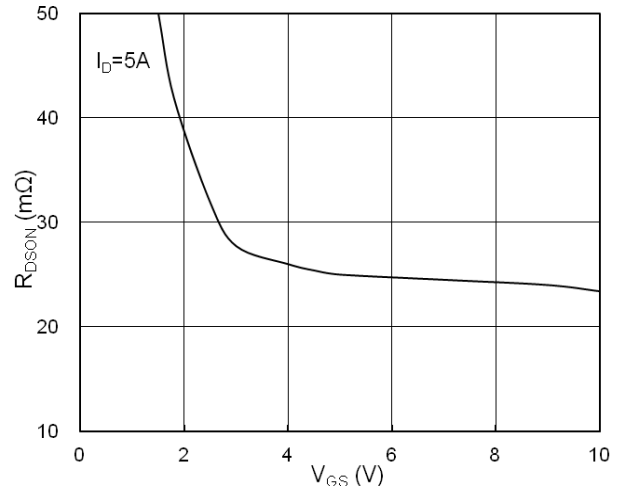


Fig.2 On-Resistance vs. Gate-Source

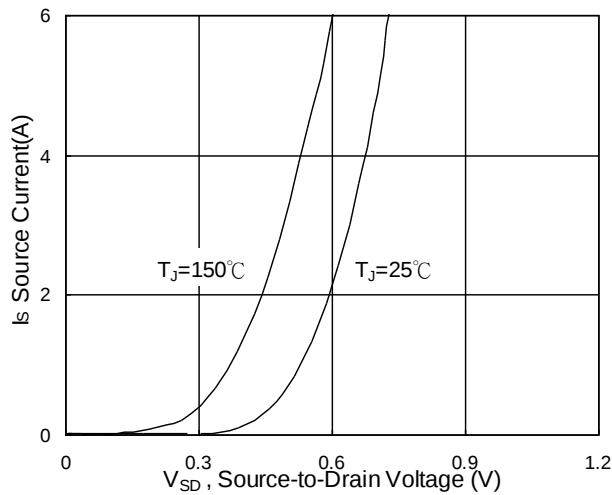


Fig.3 Forward Characteristics Of Reverse

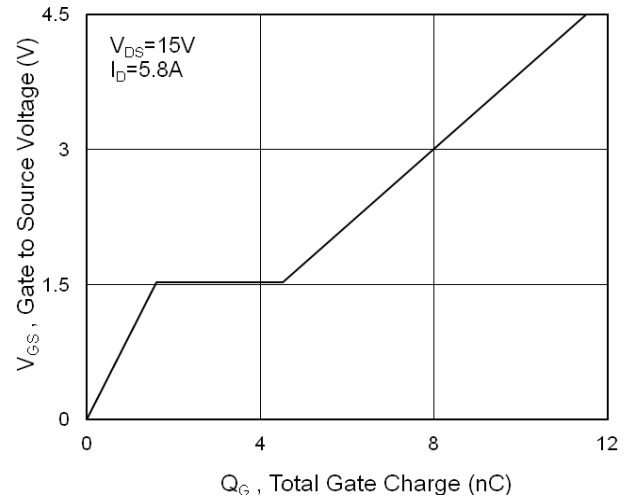


Fig.4 Gate-Charge Characteristics

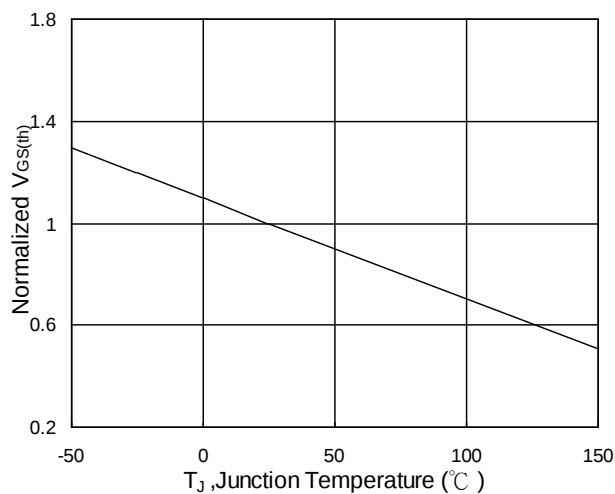


Fig.5 Normalized $V_{GS(th)}$ vs T_J

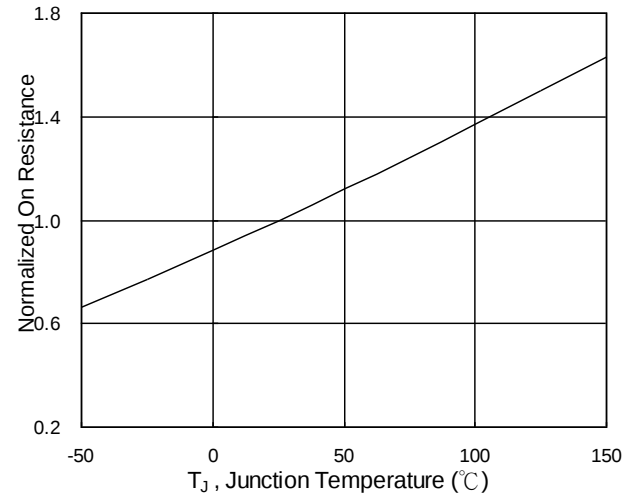


Fig.6 Normalized $R_{DS(on)}$ vs T_J

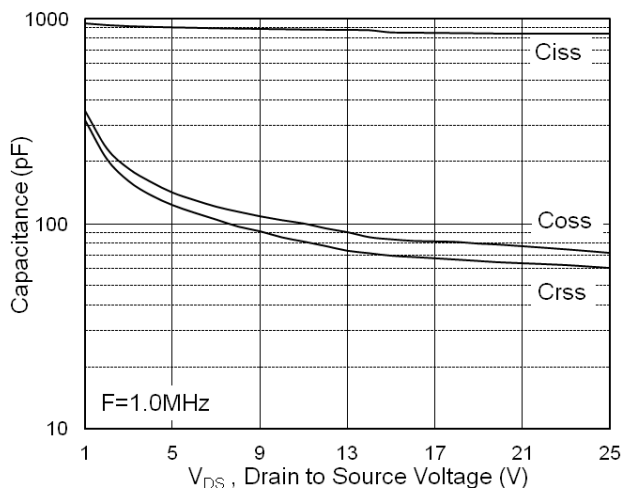


Fig.7 Capacitance

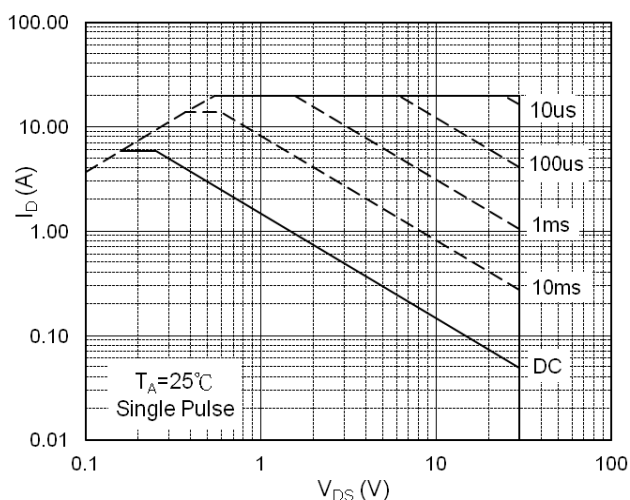


Fig.8 Safe Operating Area

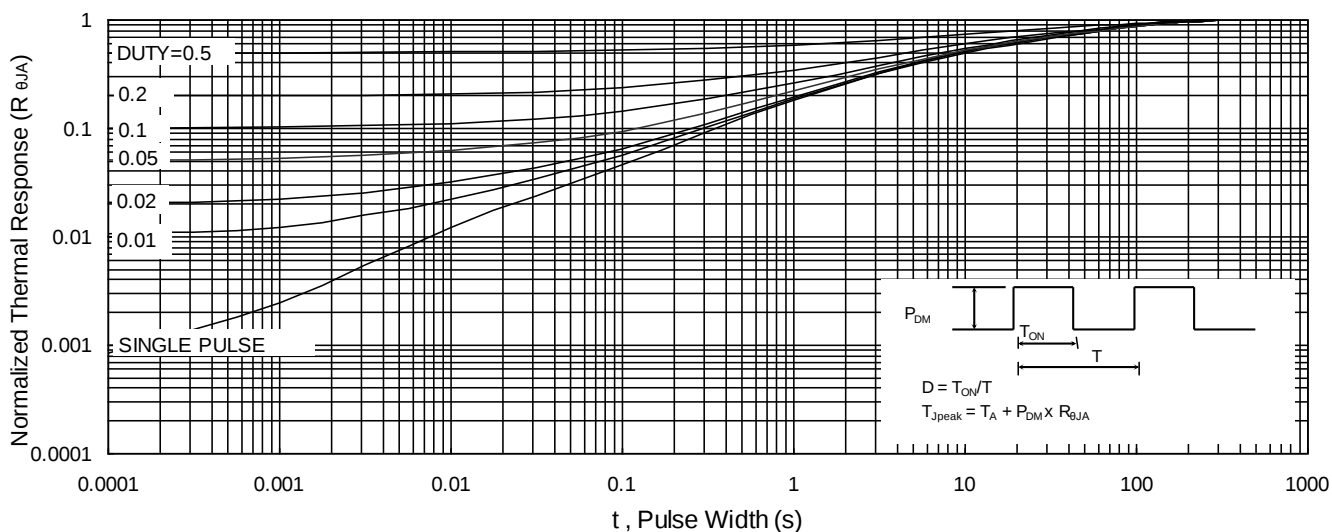


Fig.9 Normalized Maximum Transient Thermal Impedance

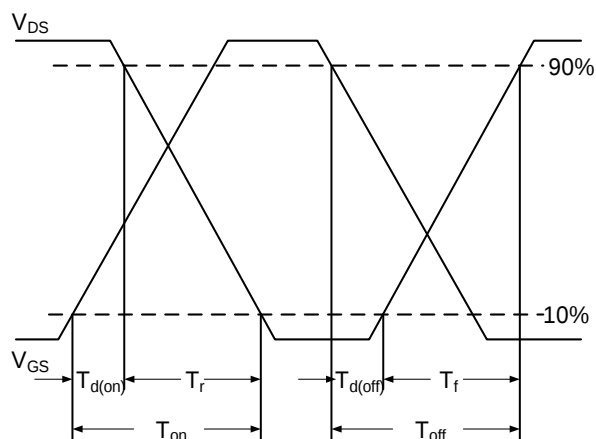


Fig.10 Switching Time Waveform

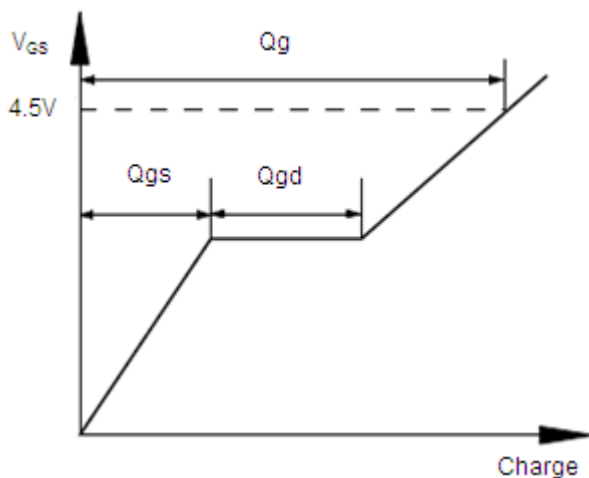


Fig.11 Gate Charge Waveform

P-Channel Typical Characteristics

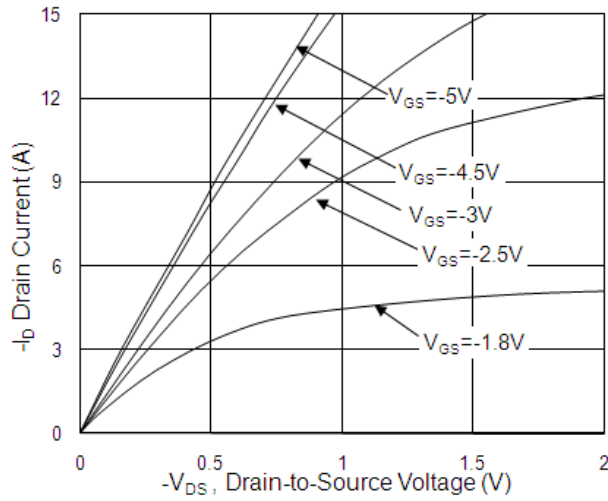


Fig.1 Typical Output Characteristics

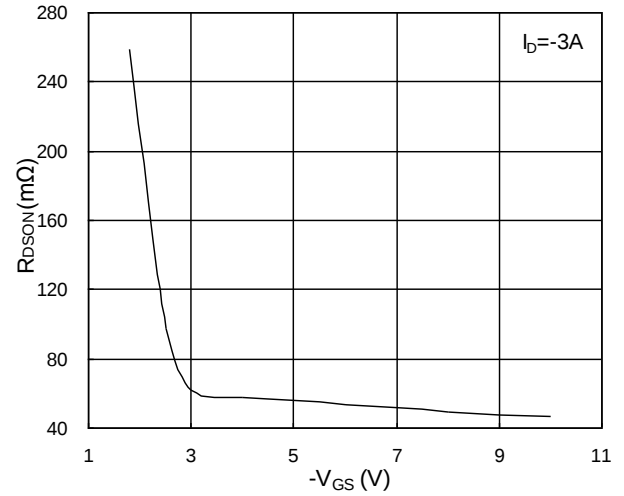


Fig.2 On-Resistance vs. Gate-Source

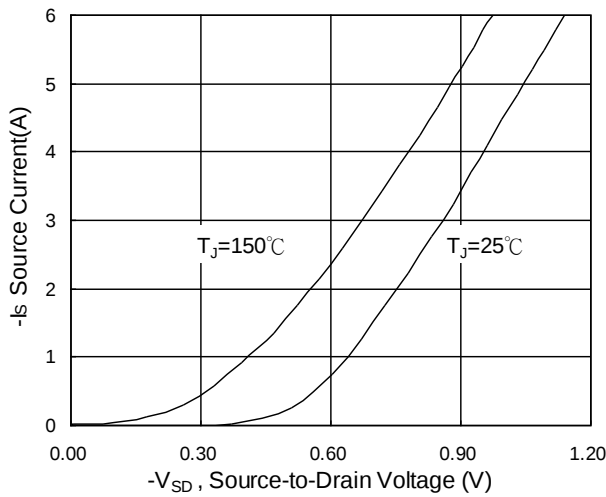


Fig.3 Forward Characteristics Of Reverse

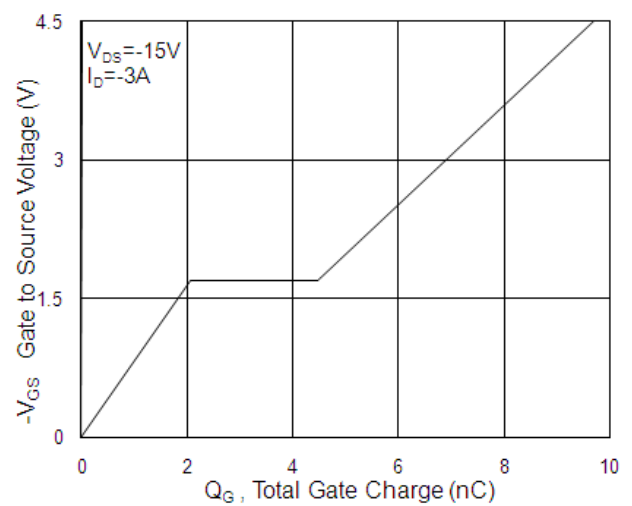


Fig.4 Gate-Charge Characteristics

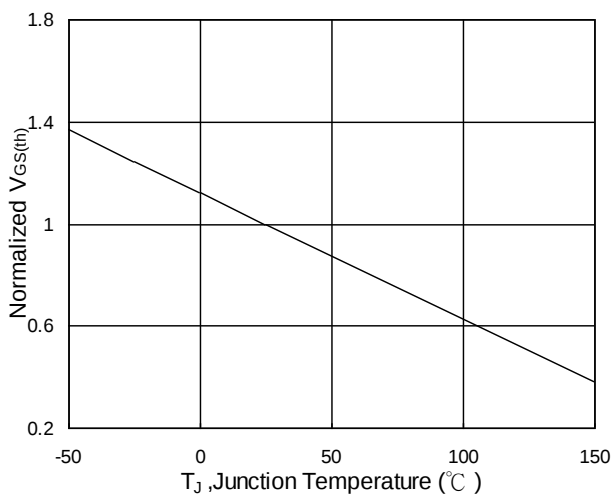


Fig.5 Normalized $V_{GS(th)}$ vs T_J

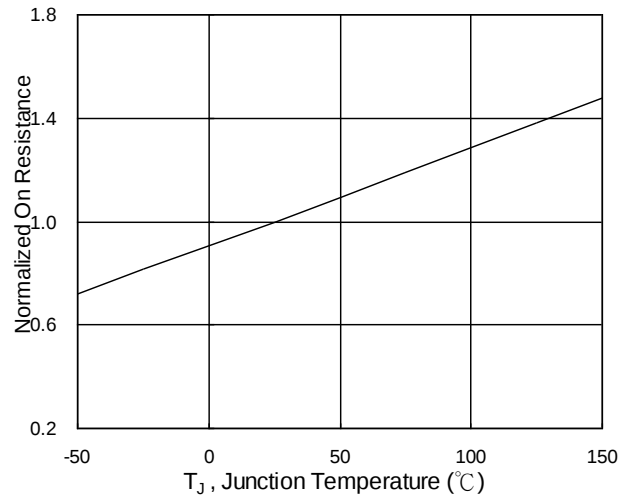


Fig.6 Normalized $R_{DS(on)}$ vs T_J

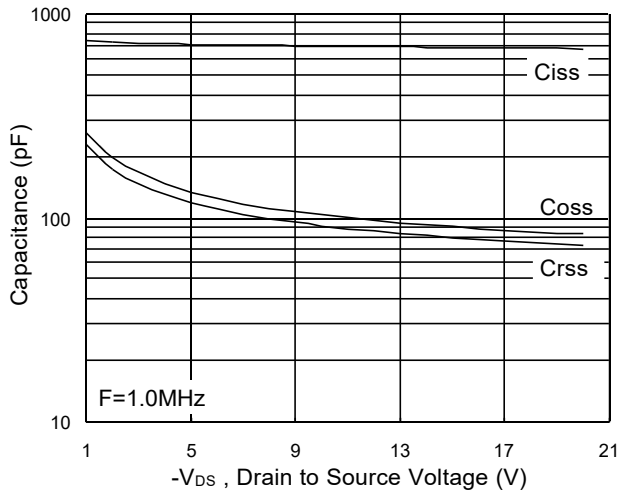


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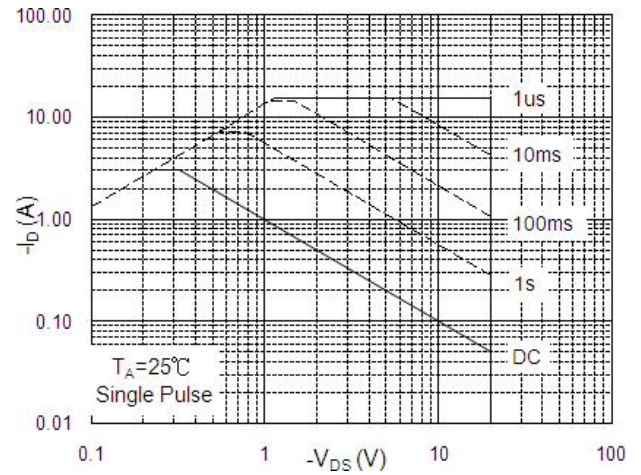


Fig.8 Safe Operating Area

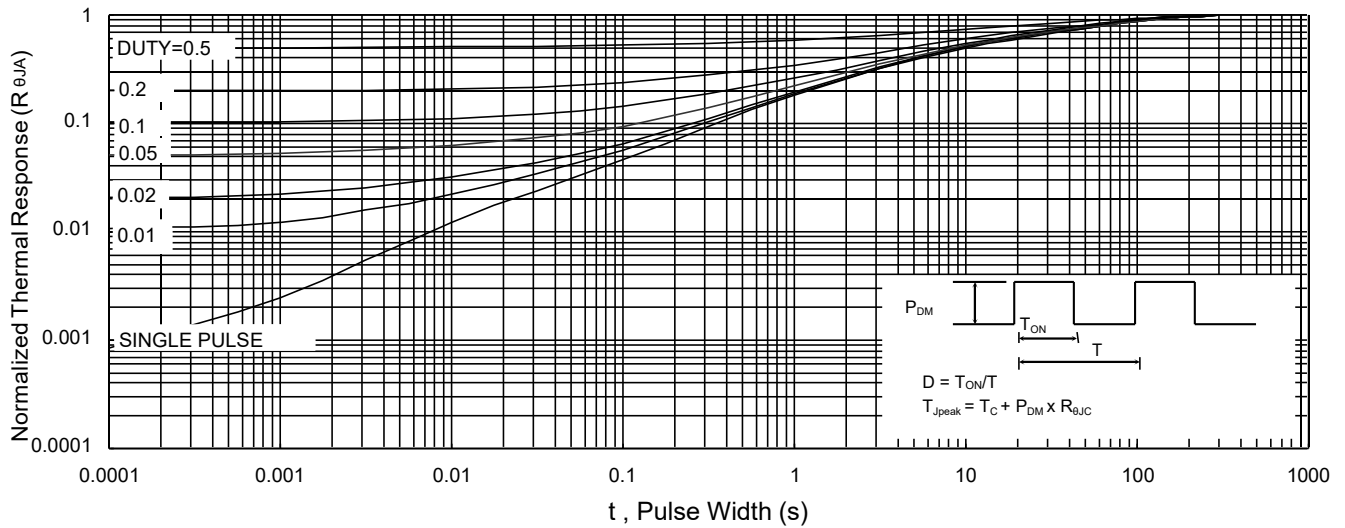


Fig.9 Normalized Maximum Transient Thermal Impedance

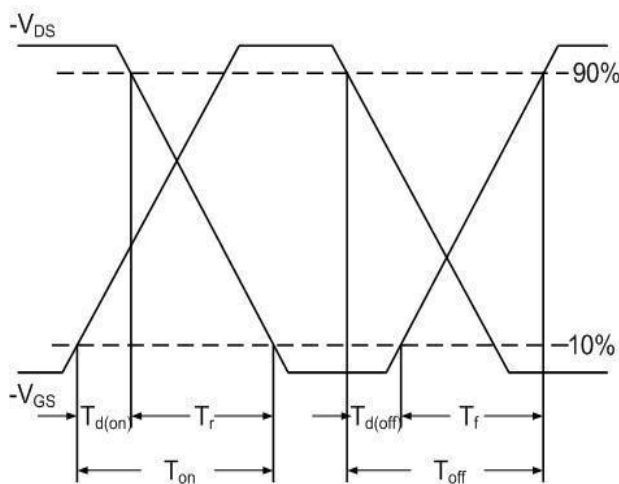


Fig.10 Switching Time Waveform

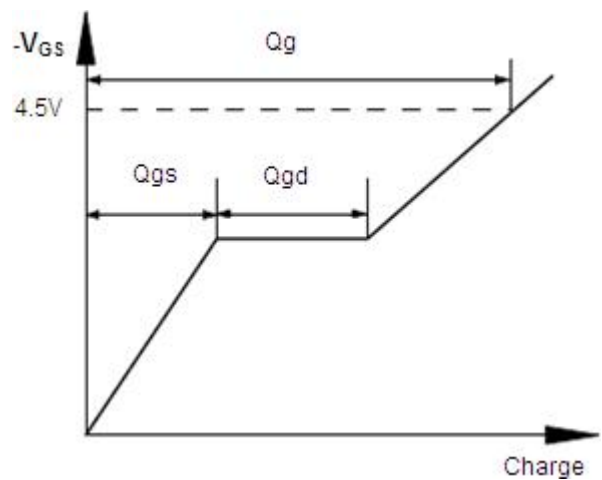


Fig.11 Gate Charge Waveform

Package Mechanical Data-SOP-8

