

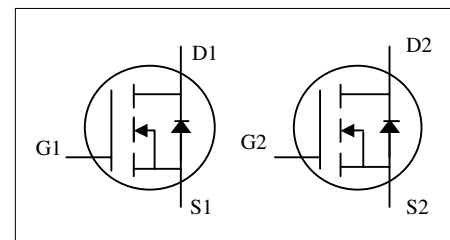
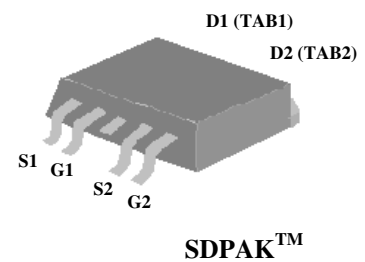
- ▼ Simple Drive Requirement
- ▼ Fast Switching Performance
- ▼ Two Independent Device
- ▼ Halogen Free & RoHS Compliant Product

## Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, ruggedized device design, ultra low on-resistance and cost-effectiveness.

SDPAK™ used APEC innovated package and provides two independent device that is suitable and optimum for DC/DC power application.

CH-1	$BV_{DSS}$	30V
	$R_{DS(ON)}$	6.2mΩ
	$I_D$	72A
CH-2	$BV_{DSS}$	30V
	$R_{DS(ON)}$	10mΩ
	$I_D$	45A



## Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		Channel-1	Channel-2	
$V_{DS}$	Drain-Source Voltage	30	30	V
$V_{GS}$	Gate-Source Voltage	± 20	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	72	45	A
$I_D@T_A=25^\circ C$	Continuous Drain Current <sup>3</sup>	18	14.1	A
$I_D@T_A=70^\circ C$	Continuous Drain Current <sup>3</sup>	14	11.2	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	72	60	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	3		W
$T_{STG}$	Storage Temperature Range	-55 to 150		°C
$T_J$	Operating Junction Temperature Range	-55 to 150		°C

## Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c (CH-1)	Maximum Thermal Resistance, Junction-case	2.5	°C/W
Rthj-c (CH-2)	Maximum Thermal Resistance, Junction-case	4.0	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient <sup>3</sup>	42	°C/W



**CH-1 Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =18A	-	-	6.2	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =12A	-	-	12.5	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1	-	3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =18A	-	32	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	-	10	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =18A	-	10	16	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =24V	-	2.5		nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =4.5V	-	5.5		nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =15V	-	7	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =18A	-	60	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =10V	-	18	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =0.833Ω	-	5	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	945	1510	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =25V	-	295	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	110	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	1.3	2	Ω

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =2.5A, V <sub>GS</sub> =0V	-	-	1.2	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>S</sub> =10A, V <sub>GS</sub> =0V,	-	30	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=100A/μs	-	27	-	nC

**CH-2 Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =12A	-	-	10	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	-	-	22	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1	-	3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =12A	-	30	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	-	10	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =12A	-	5.7	9.2	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =24V	-	1.4	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =4.5V	-	3.2	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =15V	-	6	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =12A	-	56	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =3.3Ω, V <sub>GS</sub> =10V	-	14	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =1.25Ω	-	3.5	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	505	810	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =25V	-	180	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	70	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	2.6	4	Ω

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =2.5A, V <sub>GS</sub> =0V	-	-	1.2	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>S</sub> =10A, V <sub>GS</sub> =0V,	-	24	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs	-	18	-	nC

**Notes:**

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.R<sub>thja</sub> is determined with the device, mounted on 2oz FR4 board t ≤ 10s.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

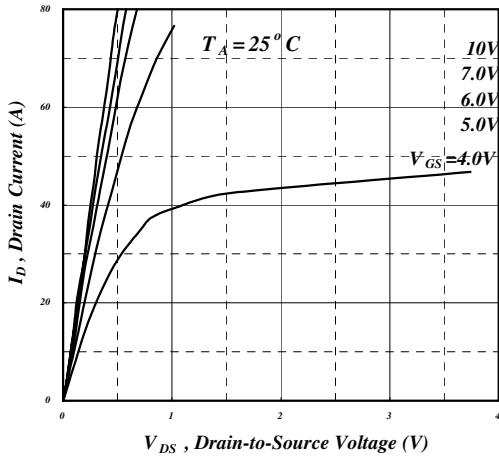
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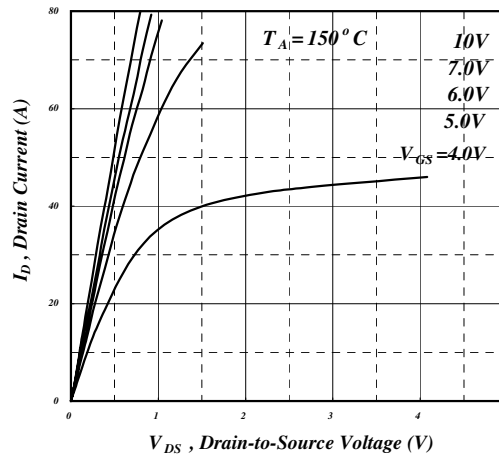
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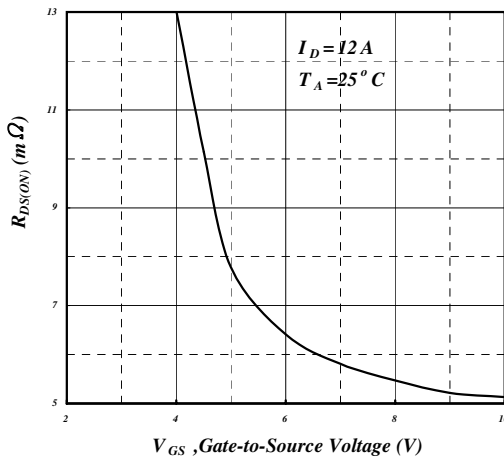
## Channel-1



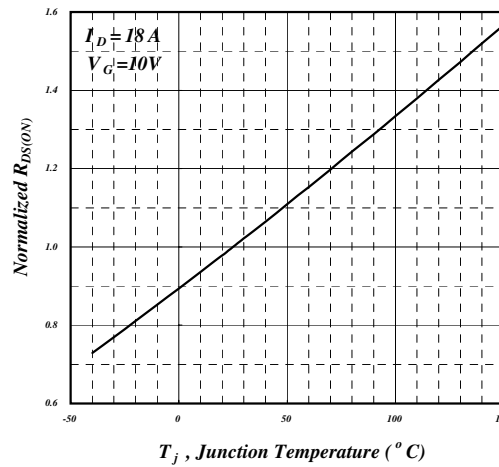
**Fig 1. Typical Output Characteristics**



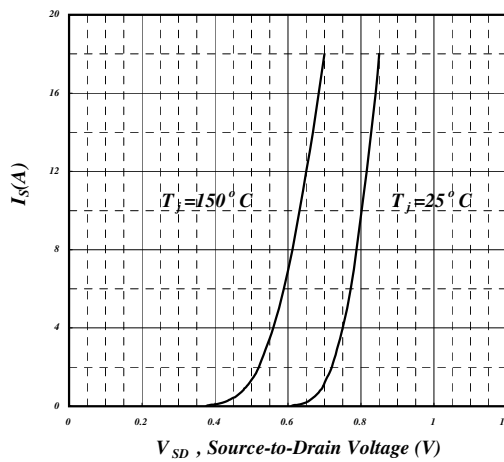
**Fig 2. Typical Output Characteristics**



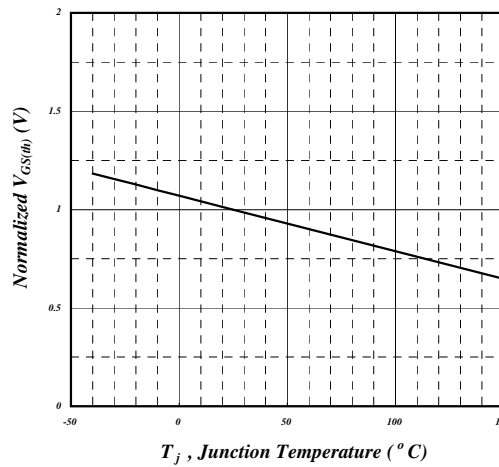
**Fig 3. On-Resistance v.s. Gate Voltage**



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



**Fig 5. Forward Characteristic of Reverse Diode**



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



Channel-1

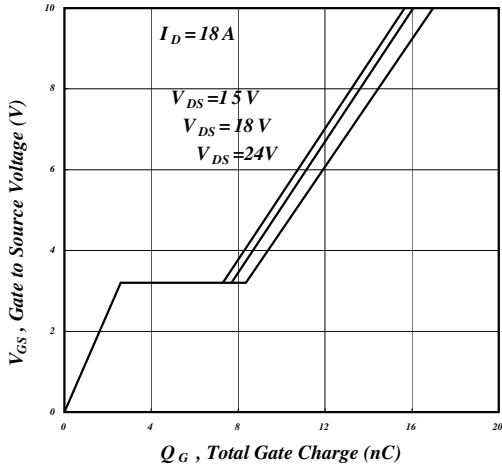


Fig 7. Gate Charge Characteristics

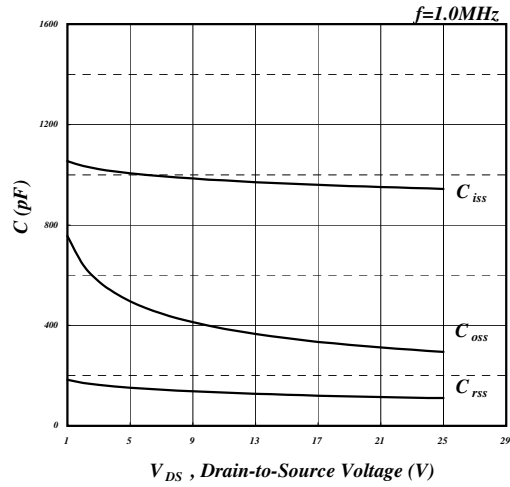


Fig 8. Typical Capacitance Characteristics

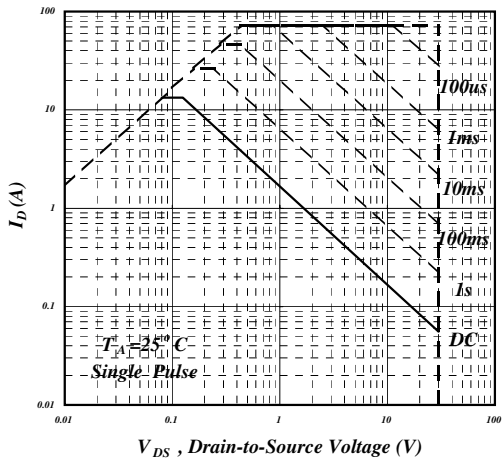


Fig 9. Maximum Safe Operating Area

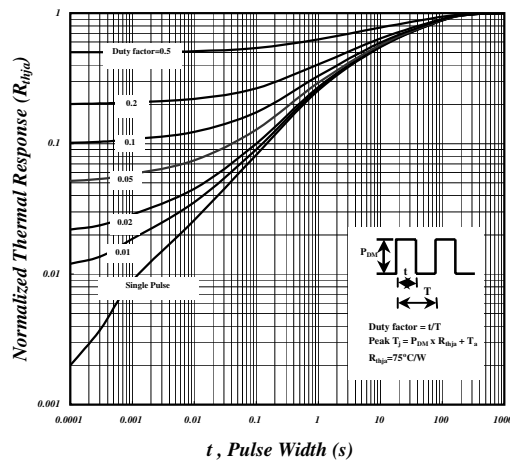


Fig 10. Effective Transient Thermal Impedance

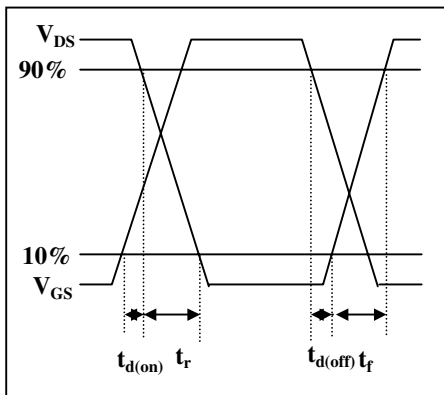


Fig 11. Switching Time Waveform

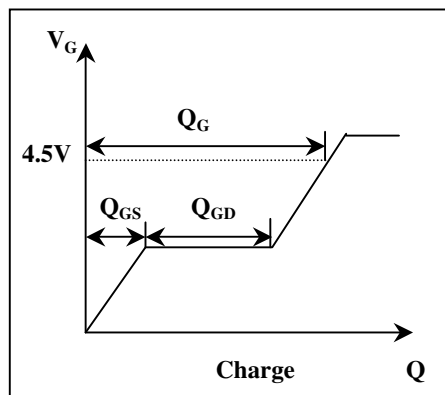


Fig 12. Gate Charge Waveform



Channel-2

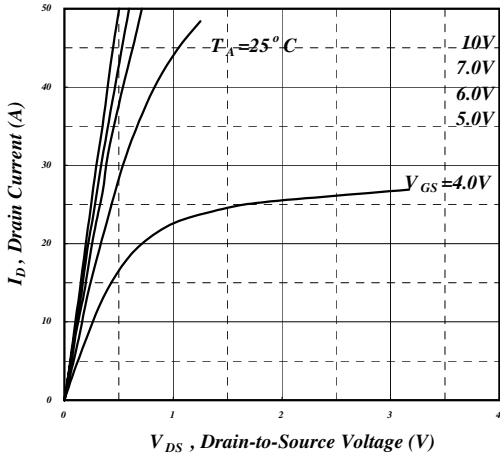


Fig 1. Typical Output Characteristics

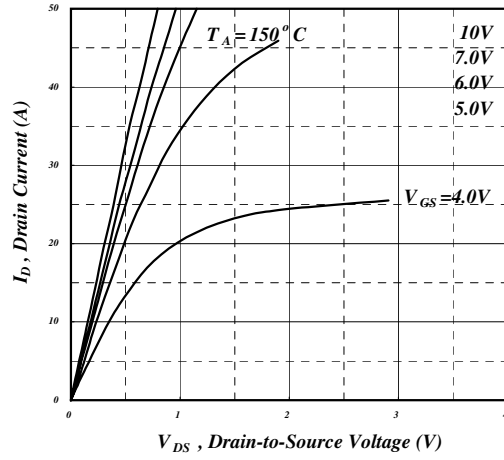


Fig 2. Typical Output Characteristics

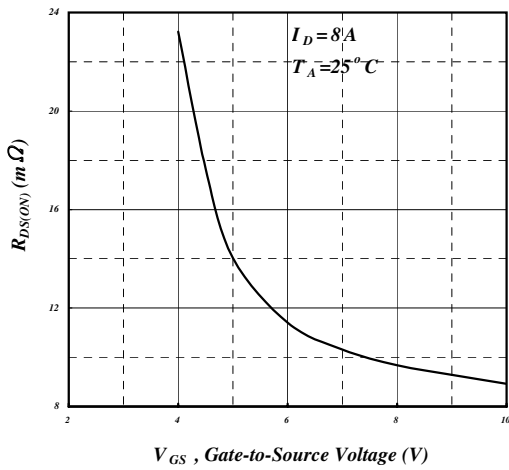


Fig 3. On-Resistance v.s. Gate Voltage

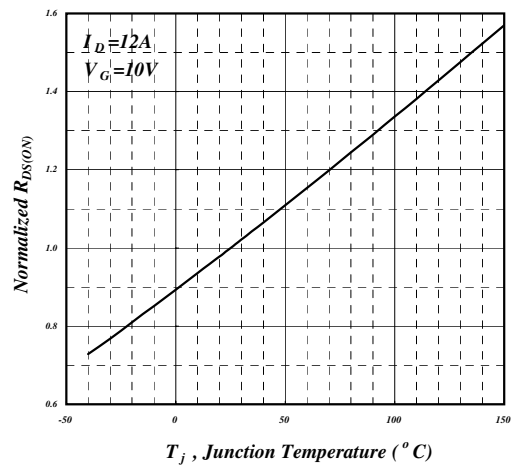


Fig 4. Normalized On-Resistance v.s. Junction Temperature

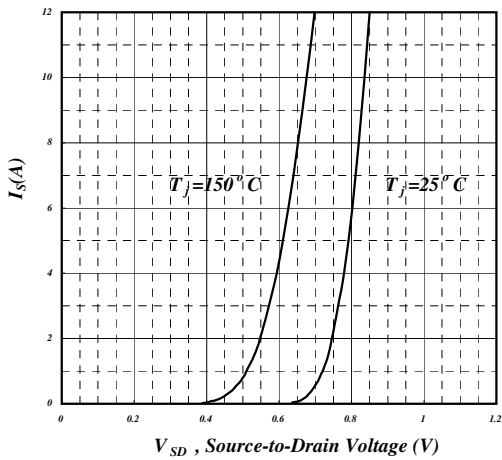


Fig 5. Forward Characteristic of Reverse Diode

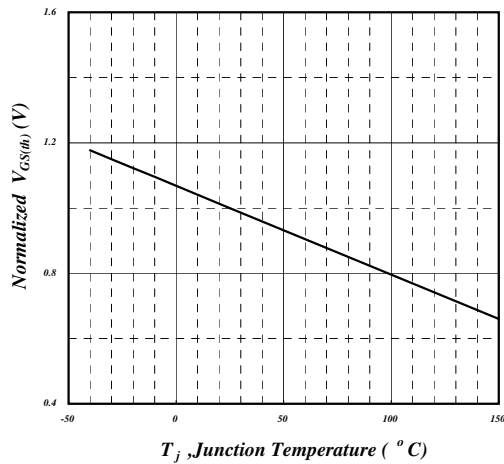


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



Channel-2

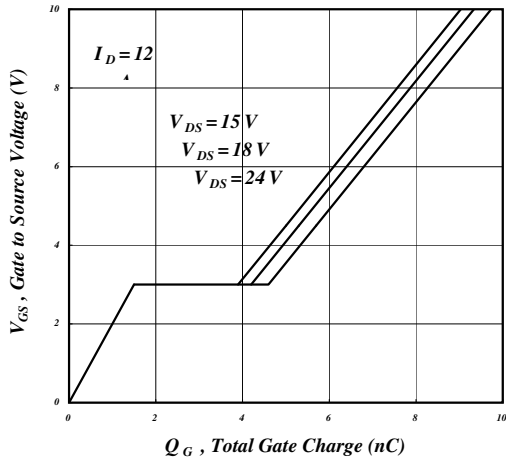


Fig 7. Gate Charge Characteristics

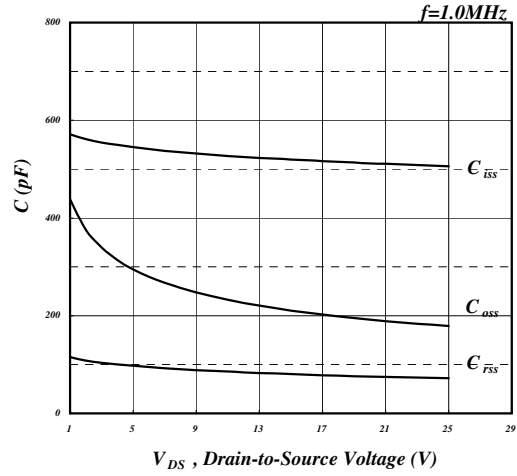


Fig 8. Typical Capacitance Characteristics

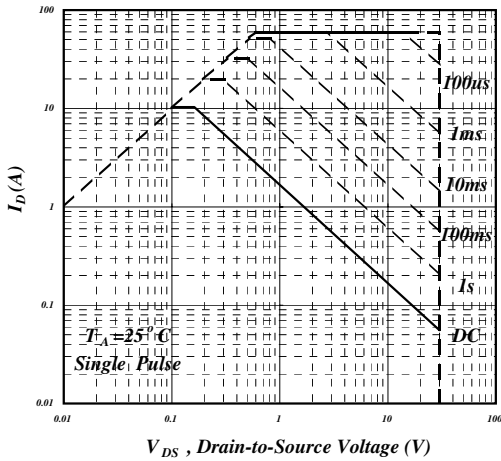


Fig 9. Maximum Safe Operating Area

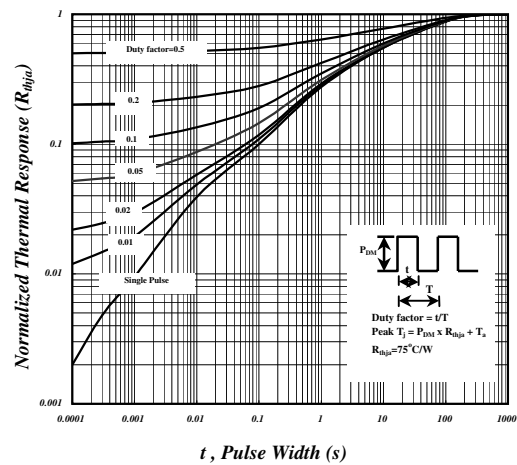


Fig 10. Effective Transient Thermal Impedance

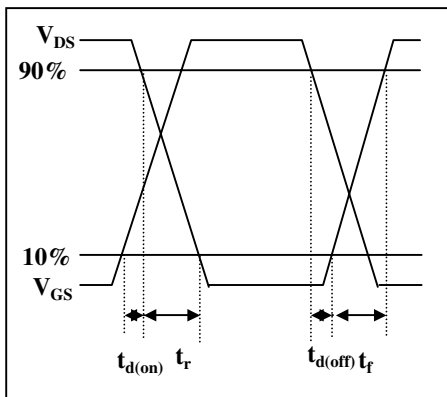


Fig 11. Switching Time Waveform

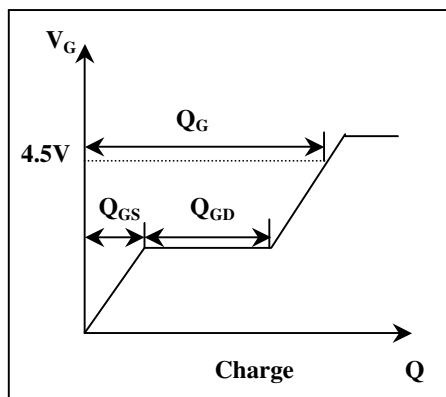


Fig 12. Gate Charge Waveform