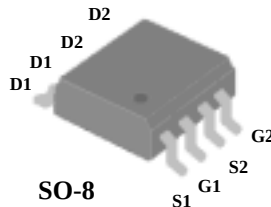




Advanced Power Electronics Corp.

AP6982GM**Pb Free Plating Product****DUAL N-CHANNEL ENHANCEMENT
MODE POWER MOSFET**

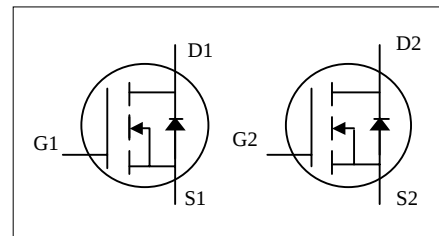
- ▼ Low On-resistance
- ▼ Fast Switching Characteristic
- ▼ Surface Mount Package



Description

The 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.

CH-1	BV_{DSS}	30V
	$R_{DS(ON)}$	18m Ω
	I_D	8.5A
CH-2	BV_{DSS}	30V
	$R_{DS(ON)}$	26m Ω
	I_D	7.3A



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		CH-1	CH2	
V_{DS}	Drain-Source Voltage	30	30	V
V_{GS}	Gate-Source Voltage	± 25	± 25	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current ³	8.5	7.3	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current ³	6.8	5.8	A
I_{DM}	Pulsed Drain Current ¹	30	30	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	2.0		W
	Linear Derating Factor	0.016		W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150		$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Thermal Resistance Junction-ambient ³	Max. 62.5	$^\circ\text{C}/\text{W}$



AP6982GM

CH-1 Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.03	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =8A	-	15	18	mΩ
		V _{GS} =4.5V, I _D =6A	-	23	30	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =8A	-	12	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _j =70°C)	V _{DS} =24V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±25V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =8A	-	14	22	nC
Q _{gs}	Gate-Source Charge	V _{DS} =24V	-	4	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	8	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =15V	-	12	-	ns
t _r	Rise Time	I _D =1A	-	7	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	25	-	ns
t _f	Fall Time	R _D =15Ω	-	9	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1050	1680	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	240	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	165	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.6	2.4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =1.7A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time ²	I _S =8A, V _{GS} =0V	-	23	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	15	-	nC

**CH-2 Electrical Characteristics@T_j=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	-	-	V
$\Delta BV_{DSS} / \Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.03	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =7A	-	22	26	mΩ
		V _{GS} =4.5V, I _D =5A	-	36	45	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =7A	-	10	-	S
I _{DSS}	Drain-Source Leakage Current (T=25°C)	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T=70°C)	V _{DS} =24V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±25V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =7A	-	9	15	nC
Q _{gs}	Gate-Source Charge	V _{DS} =24V	-	3	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	5	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =15V	-	9	-	ns
t _r	Rise Time	I _D =1A	-	6	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	19	-	ns
t _f	Fall Time	R _D =15Ω	-	6	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	640	1030	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	150	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	105	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.7	2.5	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =1.7A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time ²	I _S =7A, V _{GS} =0V	-	18	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	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 ≤10sec ; 135°C/W when mounted on min. copper pad.



AP6982GM

Channel-1

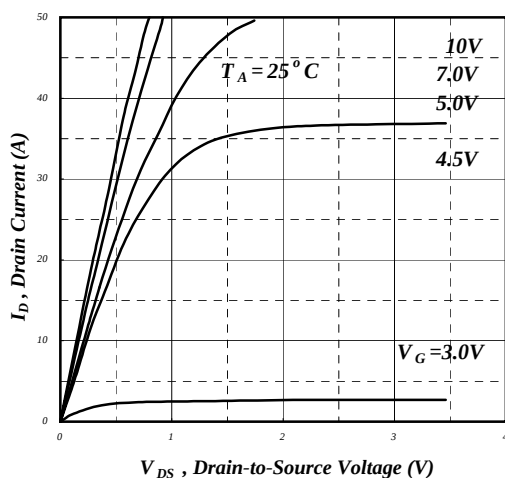


Fig 1. Typical Output Characteristics

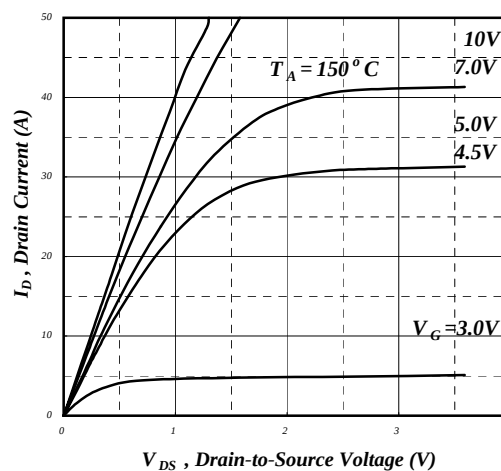


Fig 2. Typical Output Characteristics

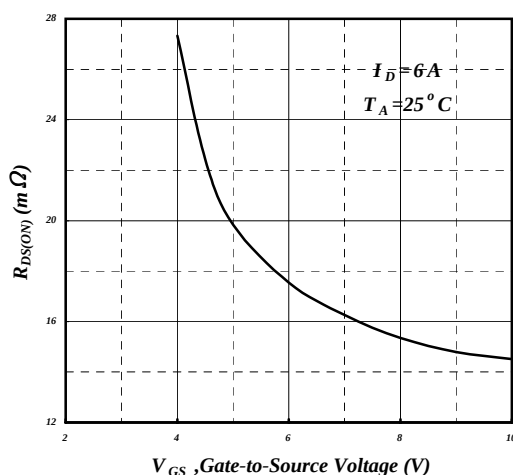


Fig 3. On-Resistance v.s. Gate Voltage

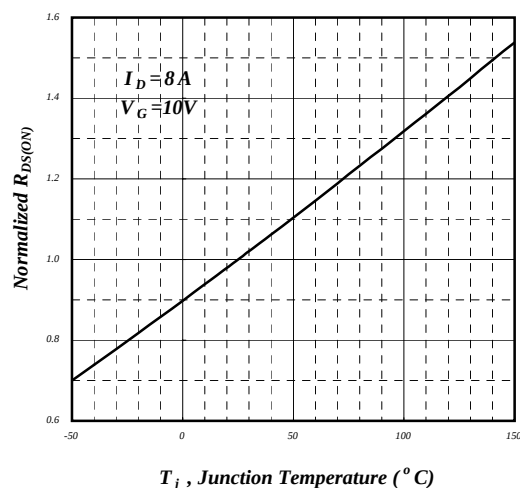


Fig 4. Normalized On-Resistance v.s. Junction Temperature

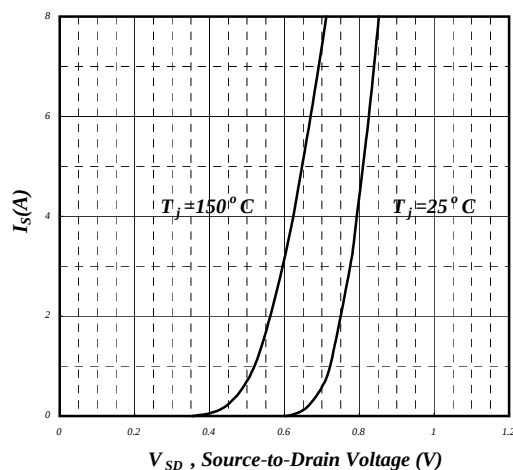


Fig 5. Forward Characteristic of Reverse Diode

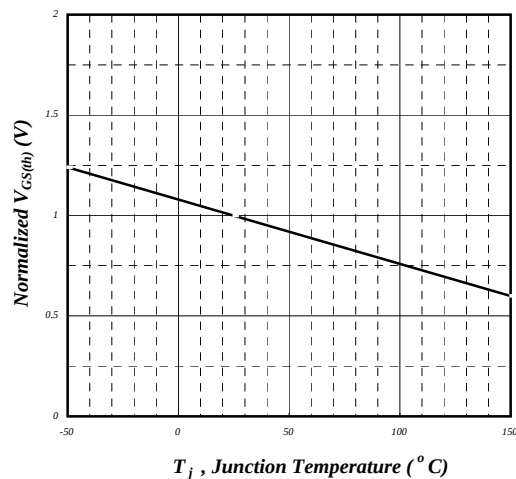


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



Channel-1

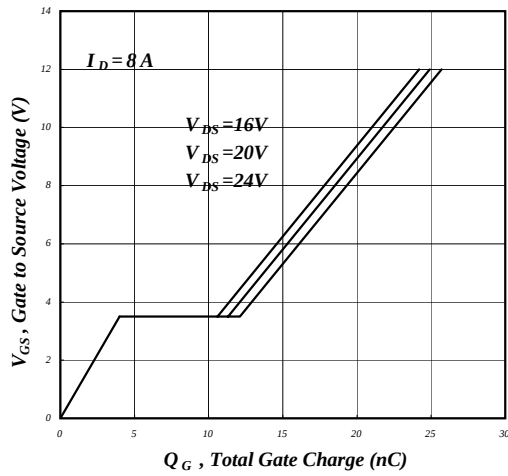


Fig 7. Gate Charge Characteristics

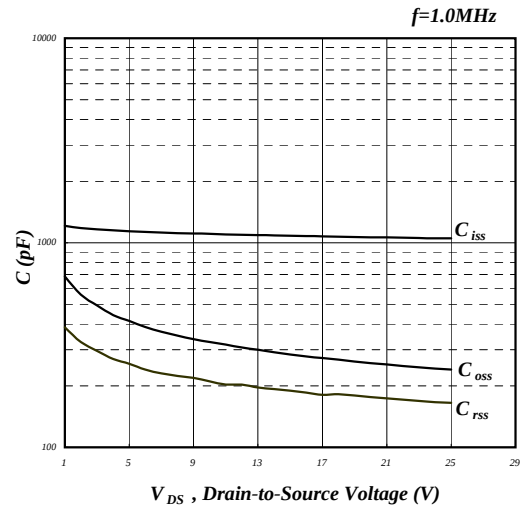


Fig 8. Typical Capacitance Characteristics

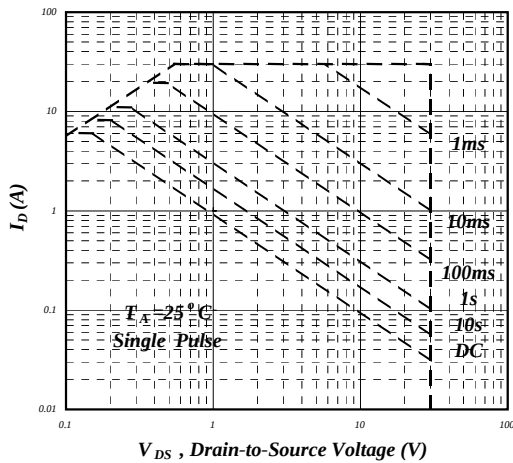


Fig 9. Maximum Safe Operating Area

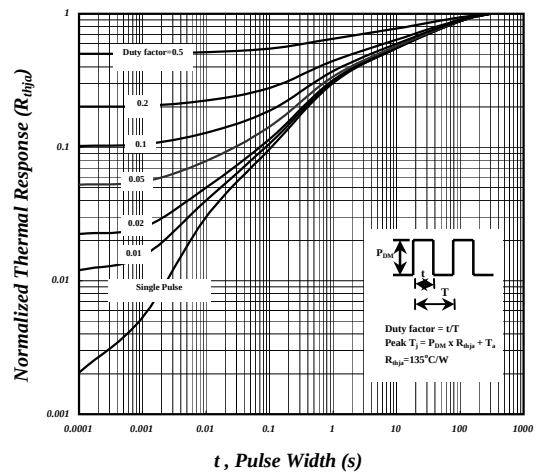


Fig 10. Effective Transient Thermal Impedance

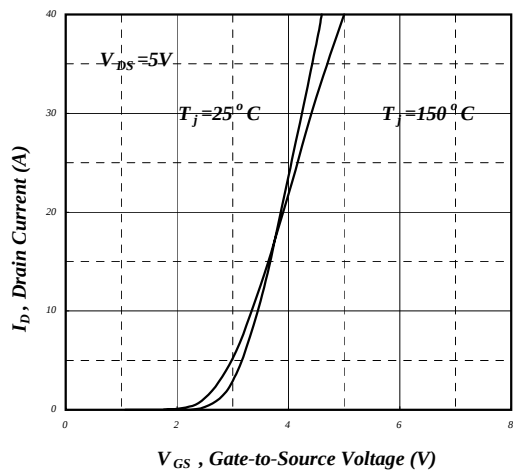


Fig 11. Transfer Characteristics

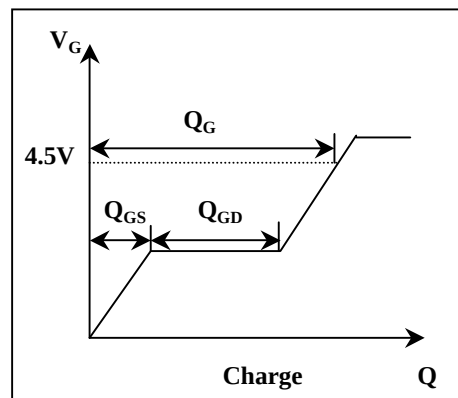


Fig 12. Gate Charge Waveform



AP6982GM

Channel-2

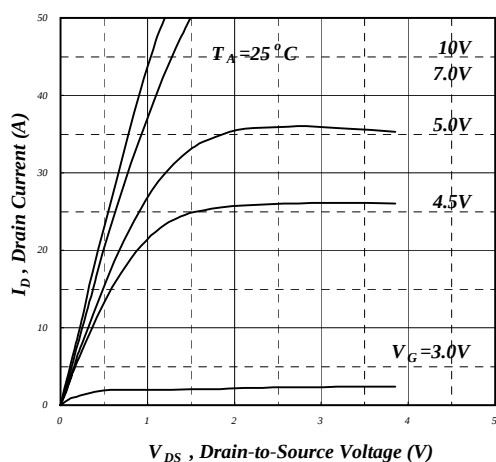


Fig 1. Typical Output Characteristics

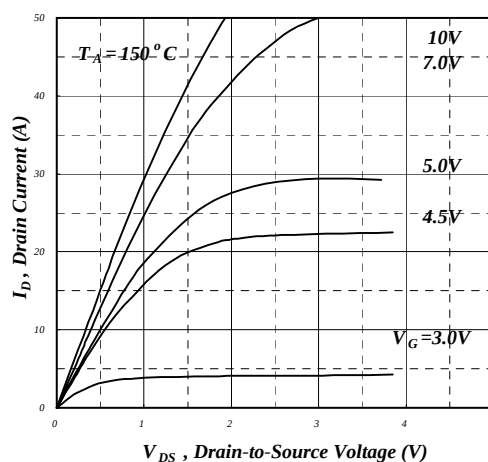


Fig 2. Typical Output Characteristics

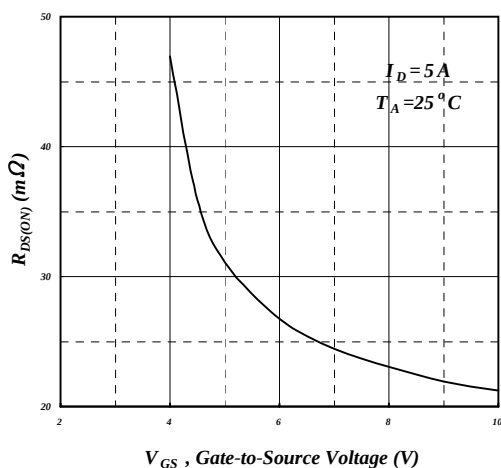


Fig 3. On-Resistance v.s. Gate Voltage

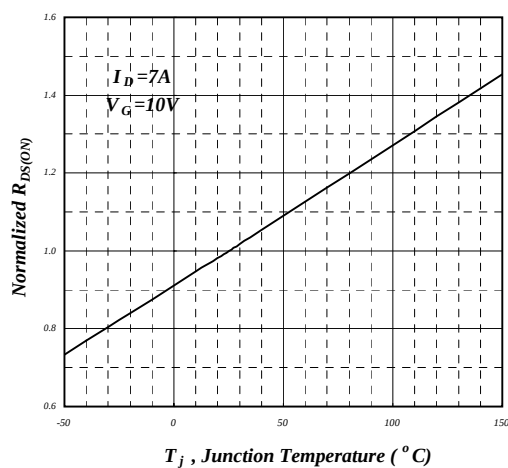


Fig 4. Normalized On-Resistance v.s. Junction Temperature

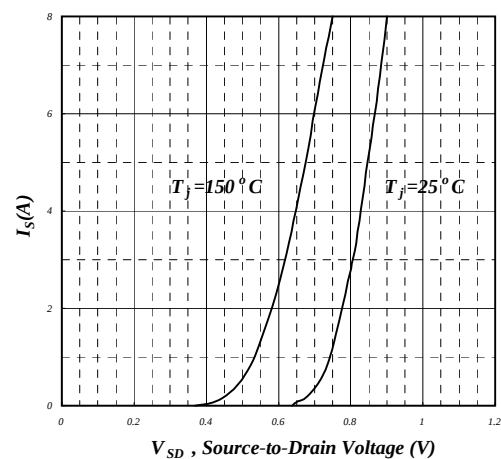


Fig 5. Forward Characteristic of Reverse Diode

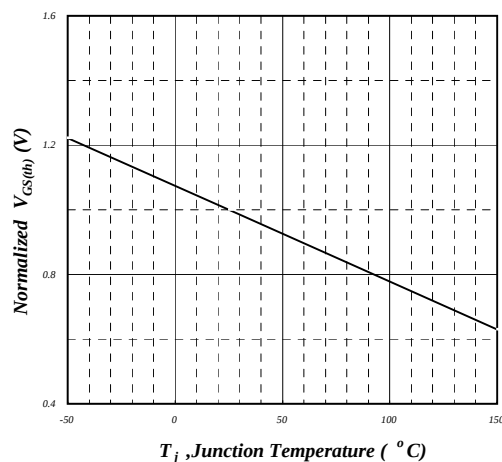


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



Channel-2

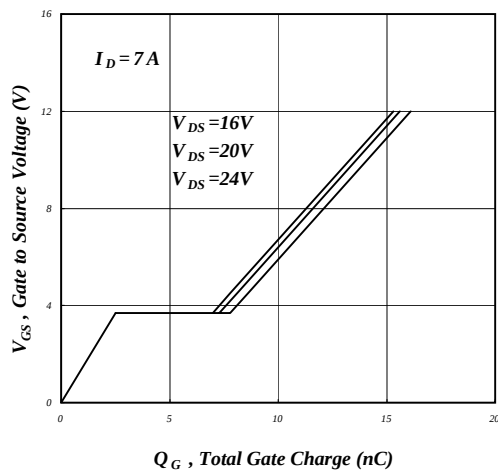


Fig 7. Gate Charge Characteristics

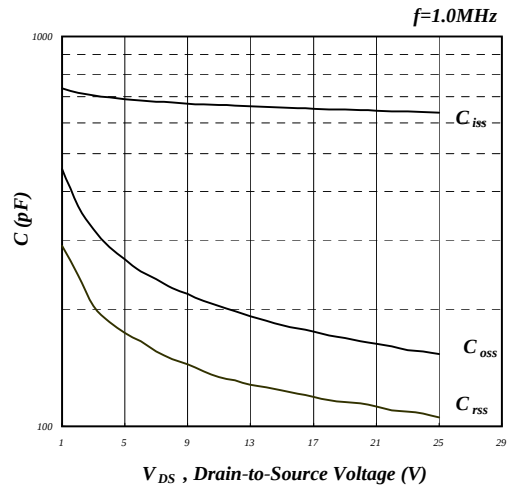


Fig 8. Typical Capacitance Characteristics

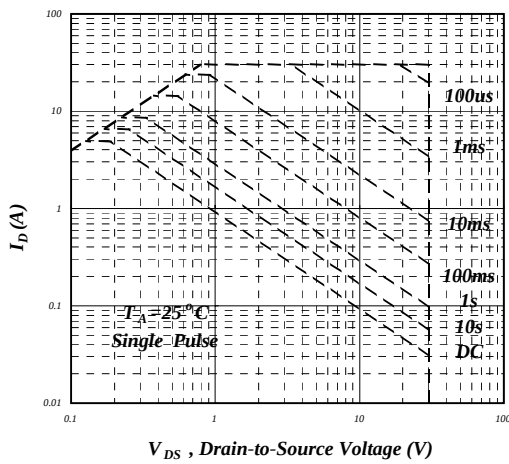


Fig 9. Maximum Safe Operating Area

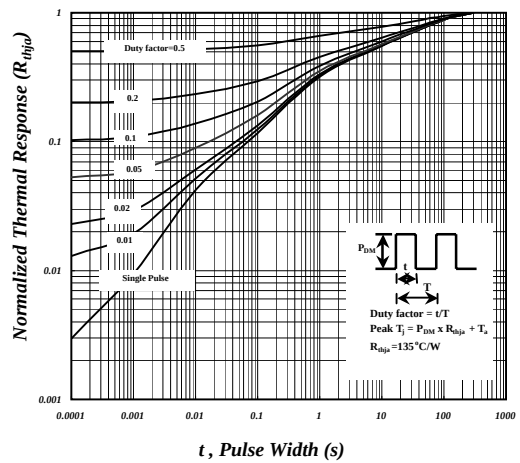


Fig 10. Effective Transient Thermal Impedance

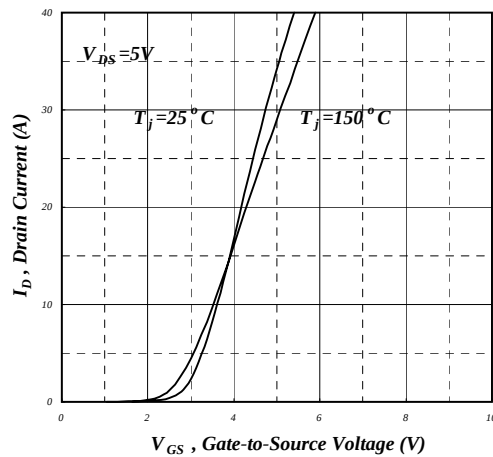


Fig 11. Transfer Characteristics

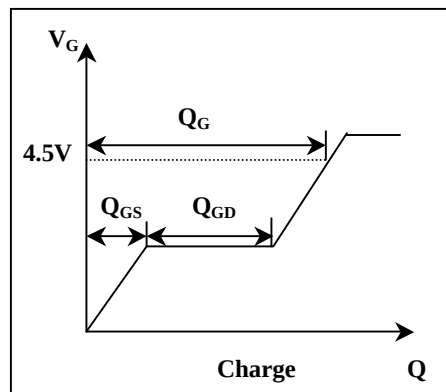


Fig 12. Gate Charge Waveform