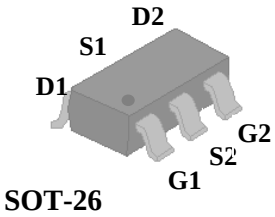
AP2535GEY-HF

Halogen-Free Product

Advanced Power Electronics Corp.

N AND P-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **Capable of 1.8V Gate Drive**
- ▼ **Lower Gate Charge**
- ▼ **Fast Switching Performance**
- ▼ **RoHS Compliant & Halogen-Free**

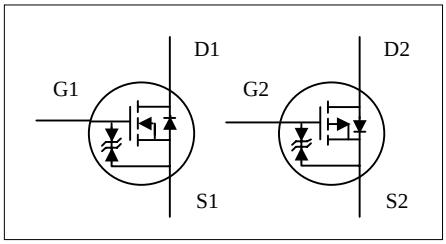


SOT-26

N-CH	BV_{DSS}	20V
	$R_{DS(ON)}$	32mΩ
	I_D	4.6A
P-CH	BV_{DSS}	-20V
	$R_{DS(ON)}$	80mΩ
	I_D	-3.1A

Description

AP2535 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.
The SOT-26 package is widely used for commercial surface mount applications.



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		N-channel	P-channel	
V_{DS}	Drain-Source Voltage	20	-20	V
V_{GS}	Gate-Source Voltage	±8	±8	V
I_D@T_A=25℃	Continuous Drain Current[3]	4.6	-3.1	A
I_D@T_A=70℃	Continuous Drain Current[3]	3.7	-2.5	A
I_{DM}	Pulsed Drain Current[1]	12	-12	A
P_D@T_A=25℃	Total Power Dissipation	1.13		W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	110	℃/W

N-CH 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	20	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V, I_D=3A	-	-	32	mΩ
		V_{GS}=2.5V, I_D=2A	-	-	40	mΩ
		V_{GS}=1.8V, I_D=1A	-	-	50	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.25	-	1	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=3A	-	16	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=16V, V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±8V, V_{DS}=0V	-	-	±30	uA
Q_g	Total Gate Charge	I_D=3A	-	9	14.4	nC
Q_{gs}	Gate-Source Charge	V_{DS}=10V	-	1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	2.5	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=10V	-	6	-	ns
t_r	Rise Time	I_D=1A	-	7	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	18	-	ns
t_f	Fall Time	V_{GS}=5V	-	3	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	600	960	pF
C_{oss}	Output Capacitance	V_{DS}=10V	-	70	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	60	-	pF
R_g	Gate Resistance	f=1.0MHz	-	2.4	4.8	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=1A, V_{GS}=0V	-	-	1.2	V
t_{rr}	Reverse Recovery Time	I_S=3A, V_{GS}=0V,	-	14	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	7	-	nC

P-CH 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	-20	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V, I_D=-2A	-	-	80	mΩ
		V_{GS}=-2.5V, I_D=-1.5A	-	-	100	mΩ
		V_{GS}=-1.8V, I_D=-1A	-	-	160	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.25	-	-1	V
g_{fs}	Forward Transconductance	V_{DS}=-5V, I_D=-2A	-	8.5	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-16V, V_{GS}=0V	-	-	-10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±8V, V_{DS}=0V	-	-	±30	uA
Q_g	Total Gate Charge	I_D=-2A	-	8	12.8	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-10V	-	1	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	2	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-10V	-	7	-	ns
t_r	Rise Time	I_D=-1A	-	13	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	23	-	ns
t_f	Fall Time	V_{GS}=-5V	-	5.5	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	640	1024	pF
C_{oss}	Output Capacitance	V_{DS}=-10V	-	70	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	60	-	pF
R_g	Gate Resistance	f=1.0MHz	-	8	16	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=-1A, V_{GS}=0V	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	I_S=-2A, V_{GS}=0V,	-	14	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	6	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board, t≤5sec ; 180℃/W when mounted on min. copper pad.

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

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

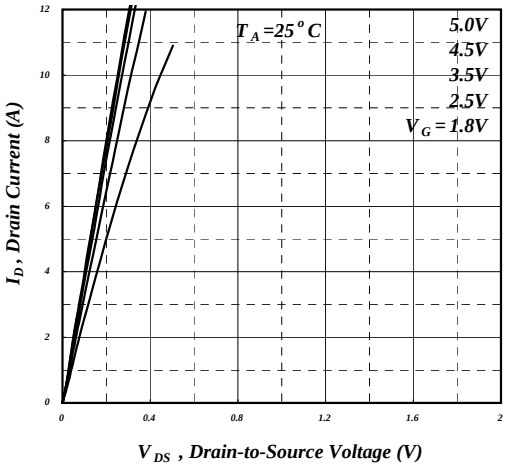


Fig 1. Typical Output Characteristics

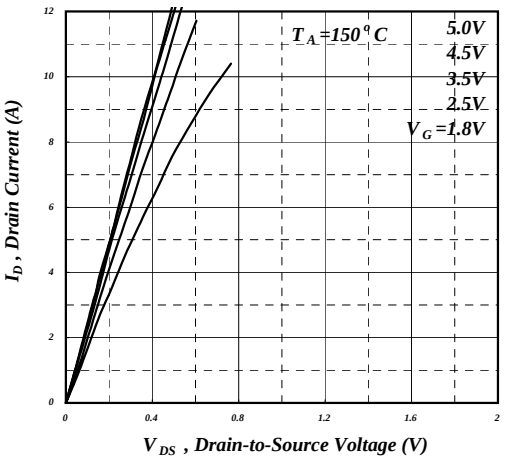


Fig 2. Typical Output Characteristics

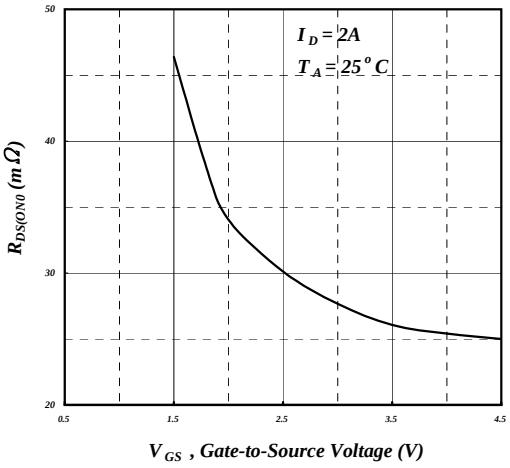


Fig 3. On-Resistance v.s. Gate Voltage

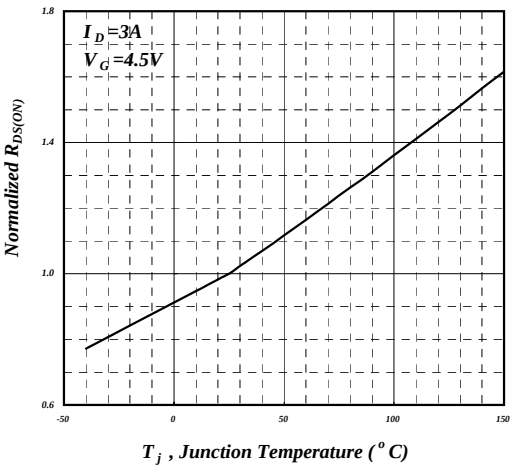


Fig 4. Normalized On-Resistance v.s. Junction Temperature

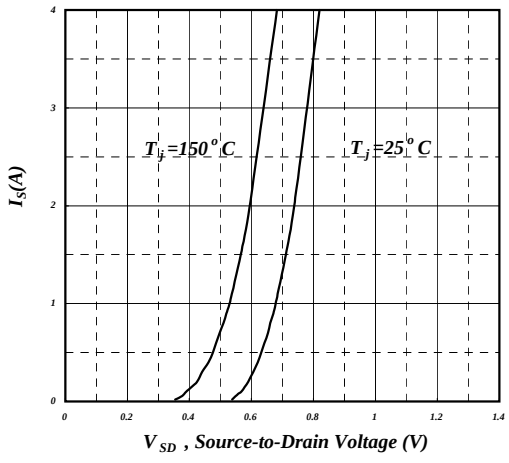


Fig 5. Forward Characteristic of Reverse Diode

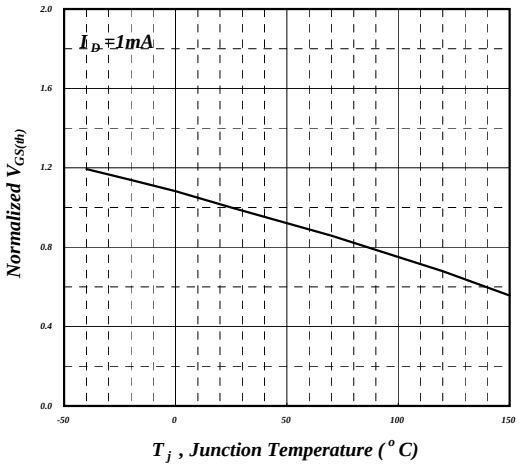


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

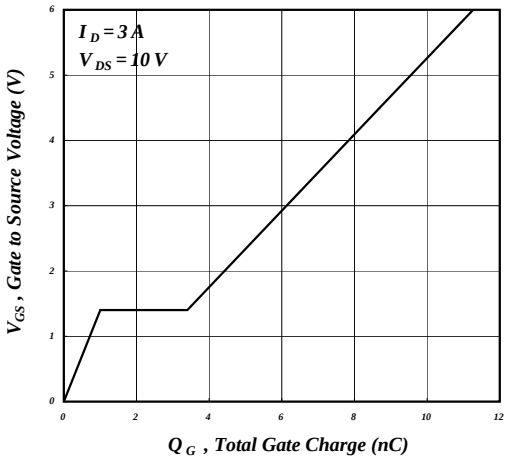


Fig 7. Gate Charge Characteristics

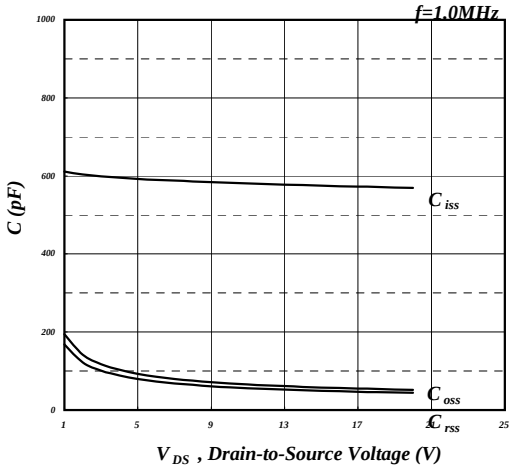


Fig 8. Typical Capacitance Characteristics

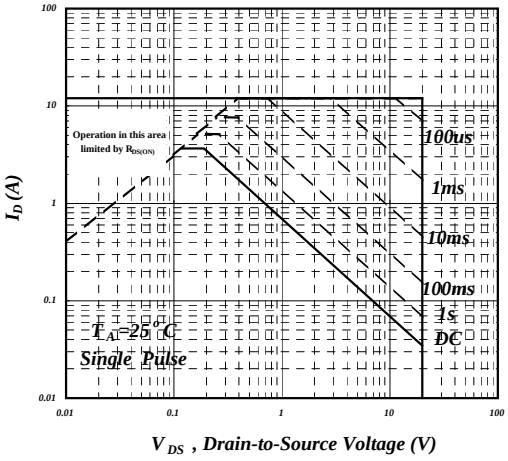


Fig 9. Maximum Safe Operating Area

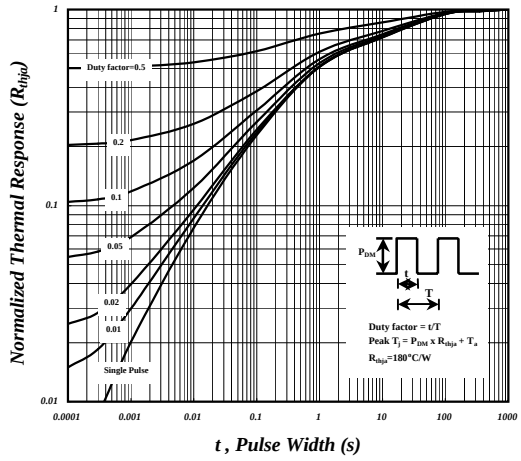


Fig 10. Effective Transient Thermal Impedance

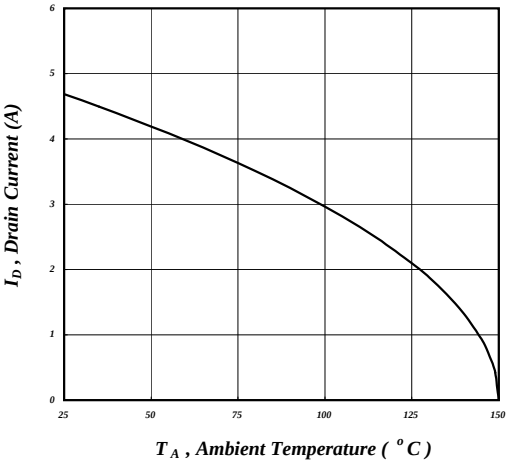


Fig 11. Maximum Continuous Drain Current v.s. Ambient Temperature

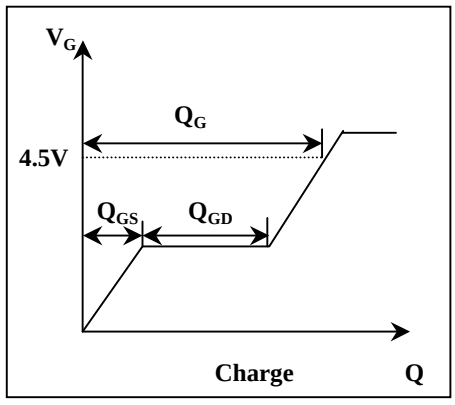
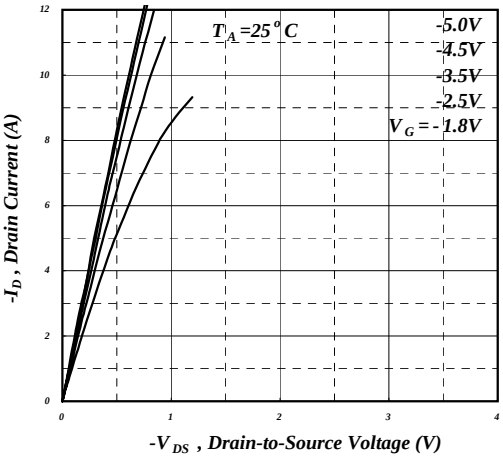


Fig 12. Gate Charge Waveform



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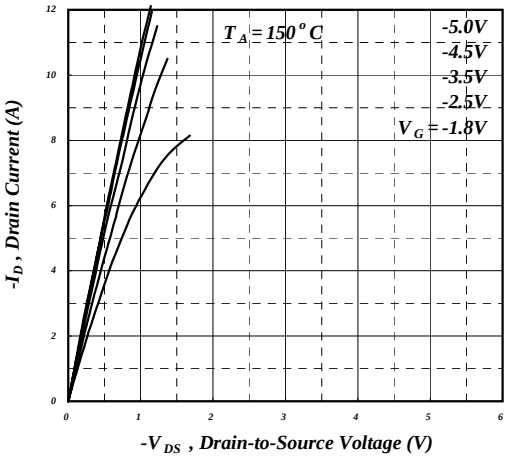
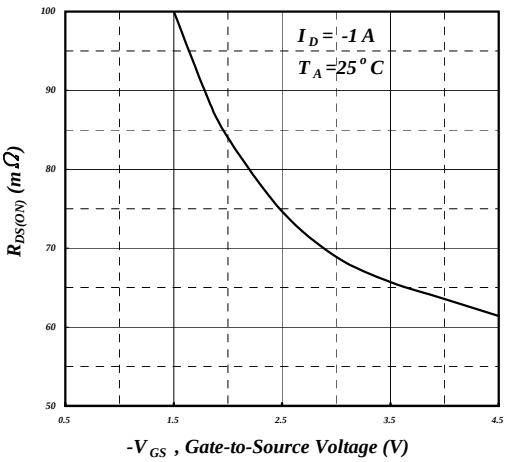


Fig 2. Typical Output Characteristics



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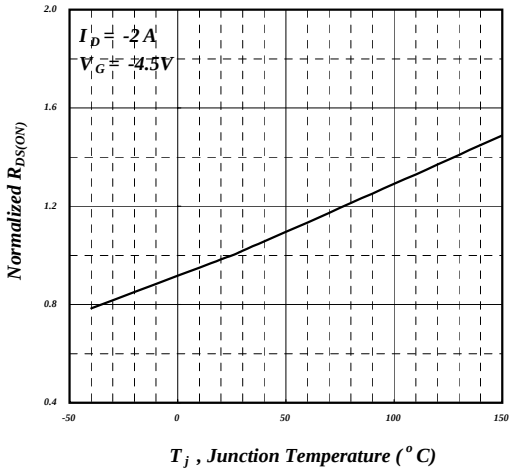
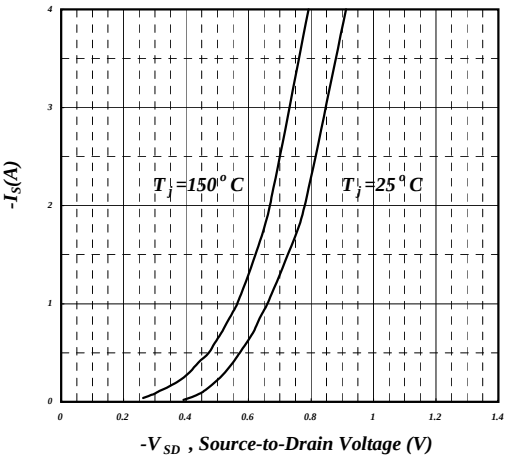


Fig 4. Normalized On-Resistance v.s. Junction Temperature



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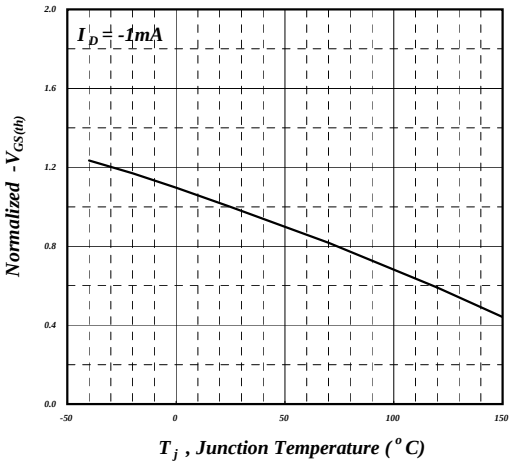
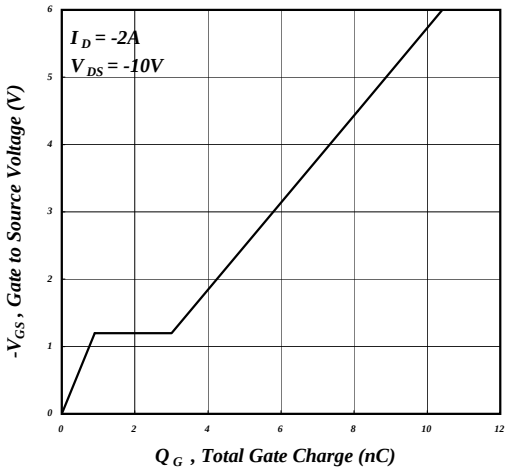


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

P-Channel



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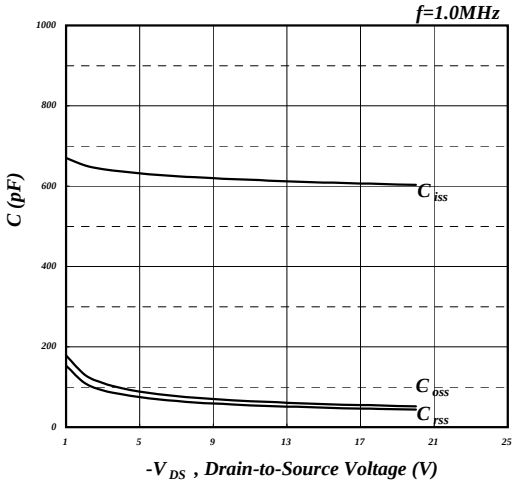

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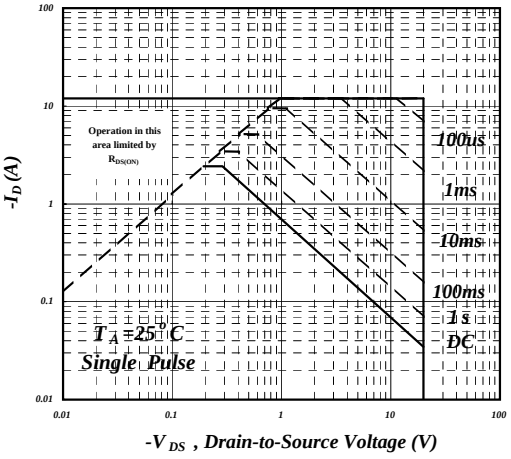

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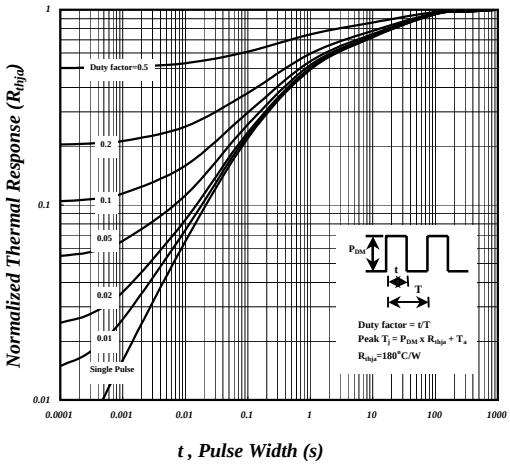

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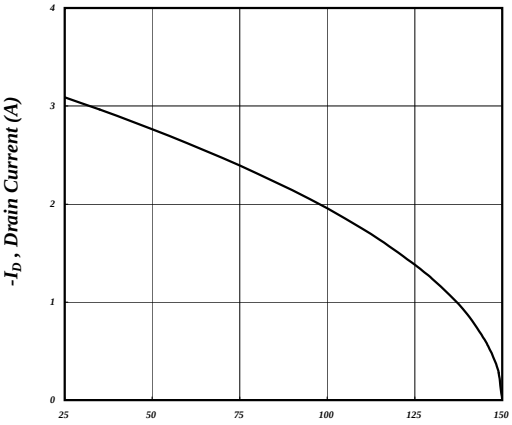

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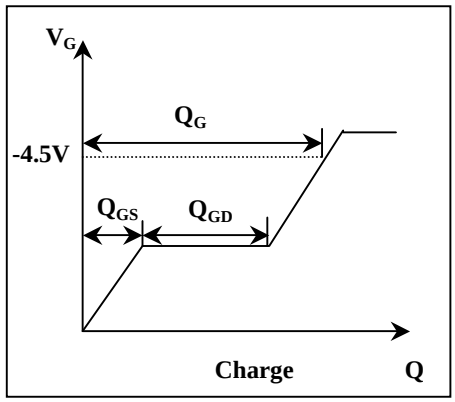

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