



Advanced Power Electronics Corp.

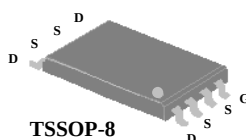
AP4425GO

RoHS-compliant Product

P-CHANNEL ENHANCEMENT MODE

POWER MOSFET

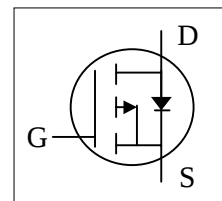
- ▼ Small & Thin Package
- ▼ Fast Switching Characteristic
- ▼ Capable of 1.8V Gate Drive



BV_{DS}	-20V
$R_{DS(ON)}$	42m Ω
I_D	-4.2A

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.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	- 20	V
V_{GS}	Gate-Source Voltage	± 8	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current ³	-4.2	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current ³	-3.3	A
I_{DM}	Pulsed Drain Current ¹	-30	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation	1	W
	Linear Derating Factor	0.01	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. 120	$^\circ\text{C}/\text{W}$
Rthj-L	Thermal Resistance Junction-lead	Max. 70	$^\circ\text{C}/\text{W}$

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
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =-1mA	-	-0.01	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-4.5V, I _D =-4.0A	-	-	42	mΩ
		V _{GS} =-2.5V, I _D =-4.0A	-	-	52	mΩ
		V _{GS} =-1.8V, I _D =-3.0A	-	-	70	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-0.3	-	-1	V
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-4A	-	4	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =-20V, V _{GS} =0V	-	-	-1	uA
	Drain-Source Leakage Current (T _j =70°C)	V _{DS} =-16V, V _{GS} =0V	-	-	-25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} = ±8V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D = -4A	-	21	34	nC
Q _{gs}	Gate-Source Charge	V _{DS} = -10V	-	6	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} = -4.5V	-	4.4	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} = -10V	-	13	-	ns
t _r	Rise Time	I _D = -4A	-	39	-	ns
t _{d(off)}	Turn-off Delay Time	R _G = 3.3Ω, V _{GS} = -5V	-	24	-	ns
t _f	Fall Time	R _D = 2.5Ω	-	72	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1720	2752	pF
C _{oss}	Output Capacitance	V _{DS} =-10V	-	275	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	215	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	T _j =25°C, I _S =-0.86A, V _{GS} =0V	-	-	-1.2	V
t _{rr}	Reverse Recovery Time ²	I _S = -4A, V _{GS} =0V,	-	23	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	16	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test.
- 3.Surface mounted on 1 in² copper pad of FR4 board t≤10s.

THIS PRODUCT IS ELECTROSTATIC SENSITIVE, PLEASE HANDLE WITH CAUTION.

THIS PRODUCT HAS BEEN QUALIFIED FOR USE IN CONSUMER APPLICATIONS. APPLICATIONS OR USE IN LIFE SUPPORT OR OTHER SIMILAR MISSION-CRITICAL DEVICES OR SYSTEMS ARE NOT AUTHORIZED.

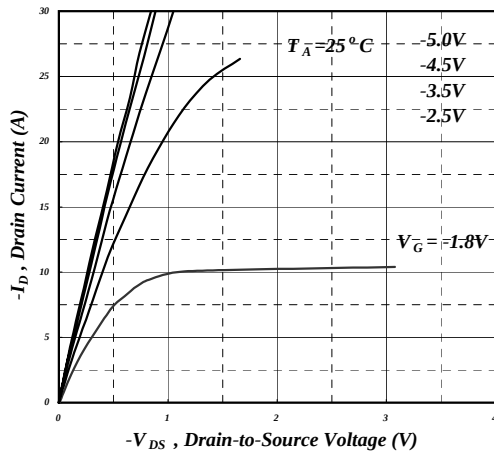


Fig 1. Typical Output Characteristics

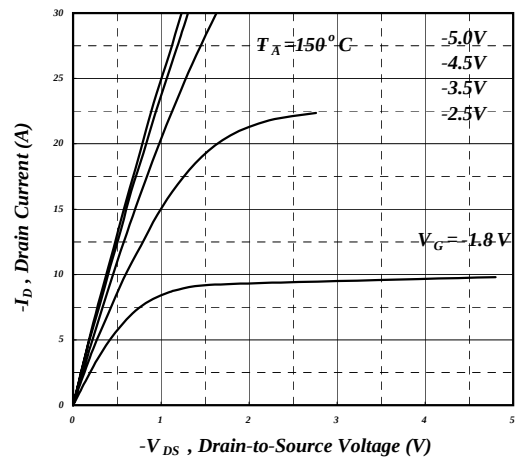


Fig 2. Typical Output Characteristics

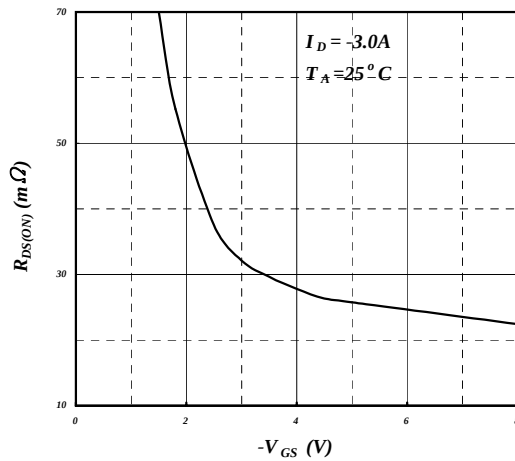


Fig 3. On-Resistance v.s. Gate Voltage

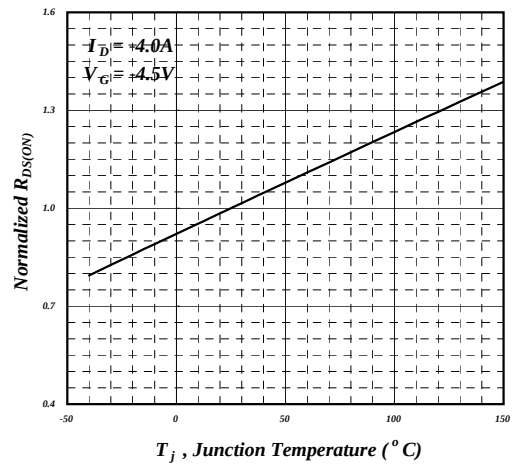


Fig 4. Normalized On-Resistance
v.s. Junction Temperature

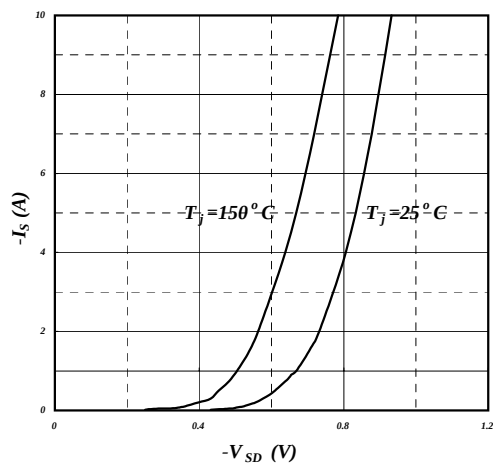


Fig 5. Forward Characteristic of
Reverse Diode

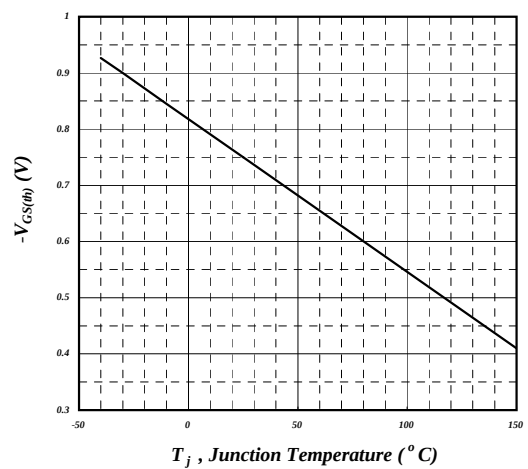


Fig 6. Gate Threshold Voltage v.s.
Junction Temperature

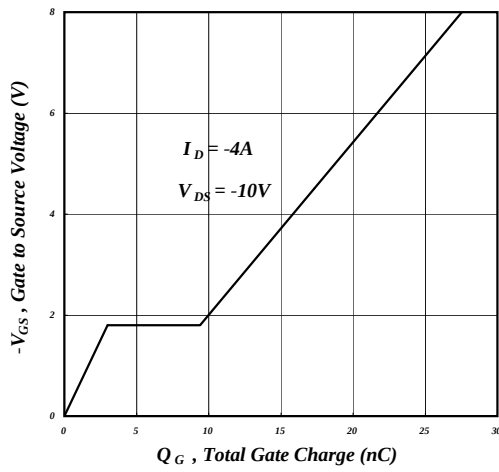


Fig 7. Gate Charge Characteristics

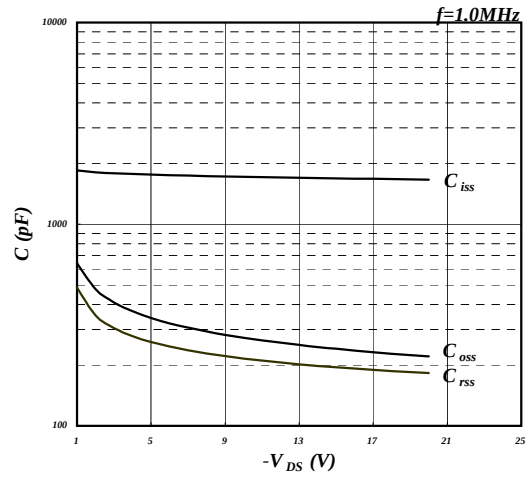


Fig 8. Typical Capacitance Characteristics

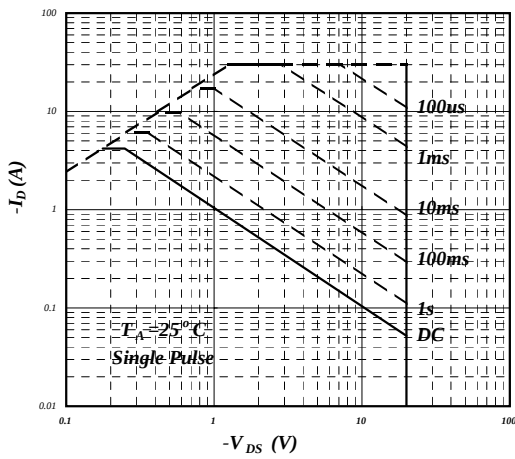


Fig 9. Maximum Safe Operating Area

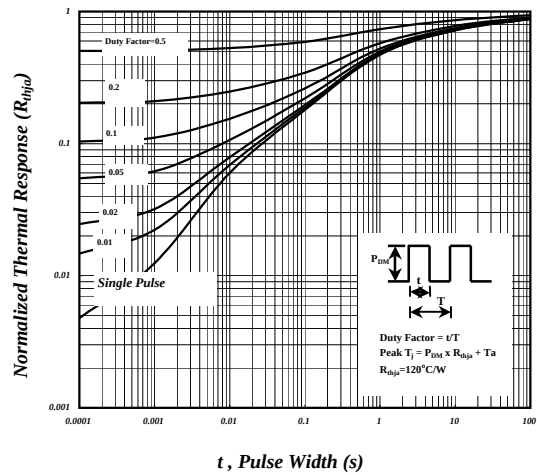


Fig 10. Effective Transient Thermal Impedance

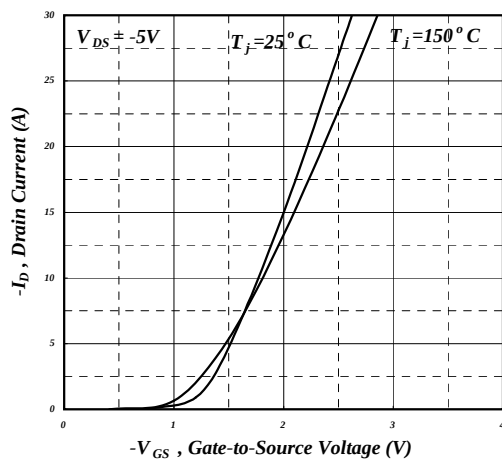


Fig 11. Transfer Characteristics

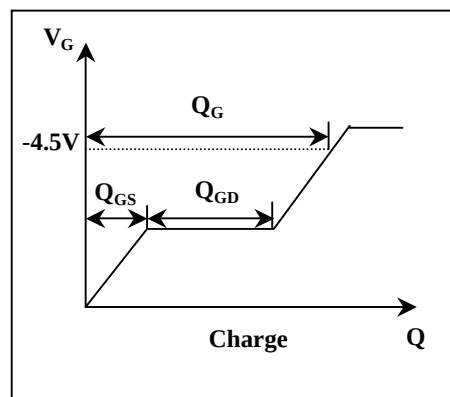


Fig 12. Gate Charge Waveform