



**Advanced Power
Electronics Corp.**

AP1203GMA

Pb Free Plating Product

N-CHANNEL ENHANCEMENT MODE

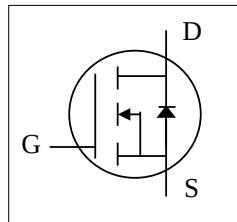
POWER MOSFET

▼ SO-8 similar area footprint and pin assignment

▼ Low Gate Charge

▼ Fast Switching Speed

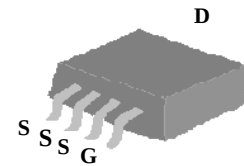
▼ RoHS Compliant



BV_{DS}	30V
$R_{DS(ON)}$	12m Ω
I_D	47A

Description

The APAK-5 package is preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



APAK-5

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	47	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	30	A
I_{DM}	Pulsed Drain Current ¹	120	A
$P_D @ T_C = 25^\circ\text{C}$	Total Power Dissipation	37	W
	Linear Derating Factor	0.29	W/ $^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy ⁴	29	mJ
I_{AR}	Avalanche Current	24	A
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	Units
Rthj-c	Thermal Resistance Junction-case Max.	3.4	$^\circ\text{C}/\text{W}$
Rthj-a	Thermal Resistance Junction-ambient ³ Max.	85	$^\circ\text{C}/\text{W}$

Data and specifications subject to change without notice

200408053-1/4


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	-	0.02	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =20A	-	-	12	mΩ
		V _{GS} =4.5V, I _D =15A	-	-	25	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance ²	V _{DS} =10V, I _D =10A	-	25	-	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 =150°C)	V _{DS} =24V, V _{GS} =0V	-	-	250	uA
I _{GSS}	Gate-Source Leakage	V _{GS} = ±20V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =20A	-	13	20	nC
Q _{gs}	Gate-Source Charge	V _{DS} =20V	-	3.3	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	8	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =15V	-	8	-	ns
t _r	Rise Time	I _D =20A	-	65	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	20	-	ns
t _f	Fall Time	R _D =0.75Ω	-	5	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1040	1660	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	-	1.9	2.9	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =45A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ²	I _S =20A, V _{GS} =0V,	-	24	-	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs	-	14	-	nC

Notes:

- 1.Pulse width limited by safe operating area.
- 2.Pulse width ≤300us , duty cycle ≤2%.
- 3.Surface mounted on FR4 board.
- 4.Starting T_J=25°C , V_{DD}=25V , L=0.1mH , R_G=25Ω

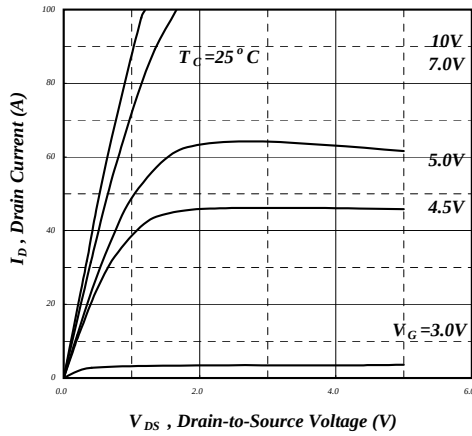


Fig 1. Typical Output Characteristics

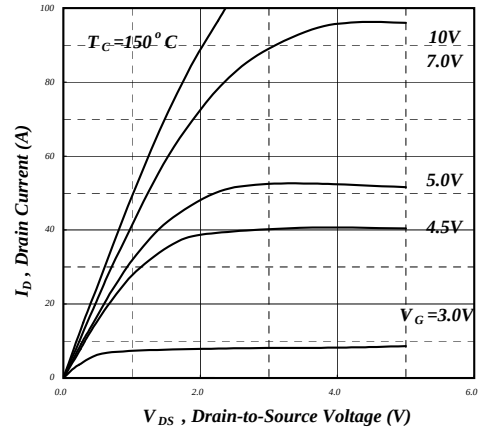


Fig 2. Typical Output Characteristics

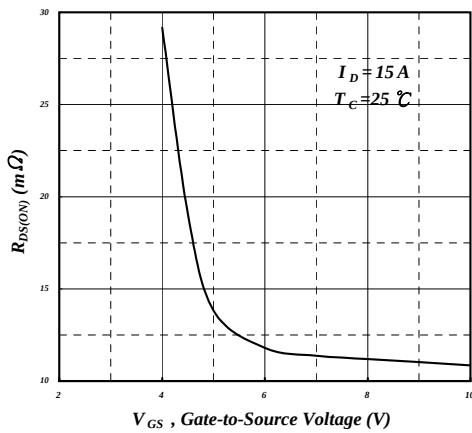


Fig 3. On-Resistance v.s. Gate Voltage

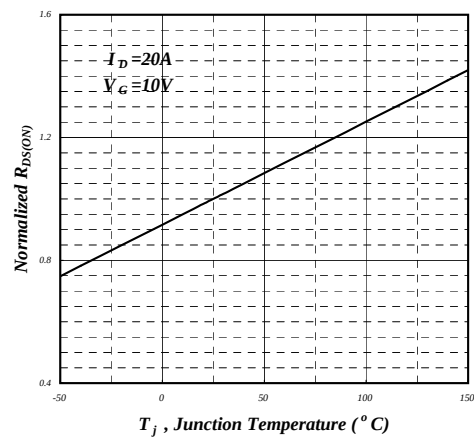


Fig 4. Normalized On-Resistance v.s. Junction Temperature

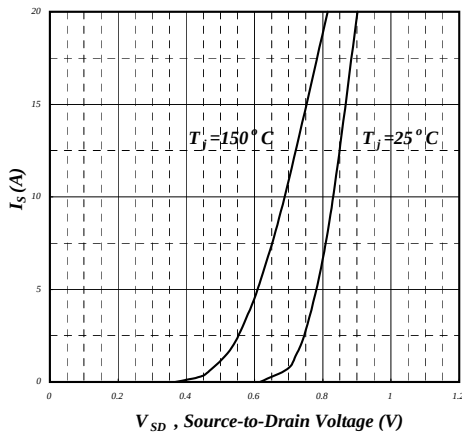


Fig 5. Forward Characteristic of Reverse Diode

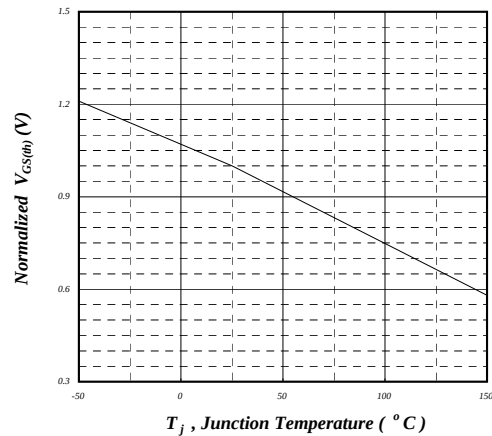


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

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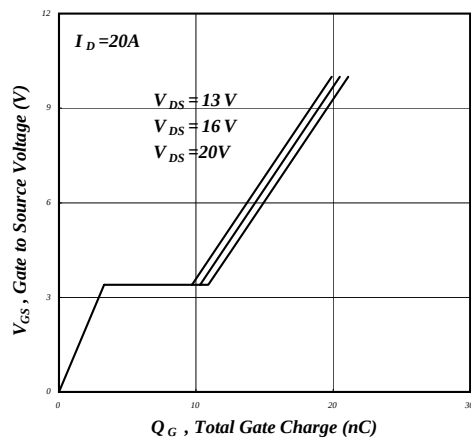


Fig7. Gate Charge Characteristics

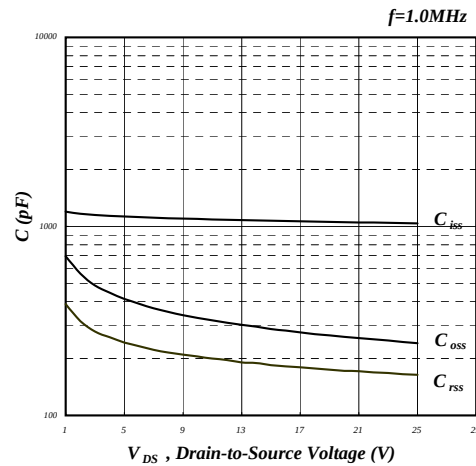


Fig 8. Typical Capacitance Characteristics

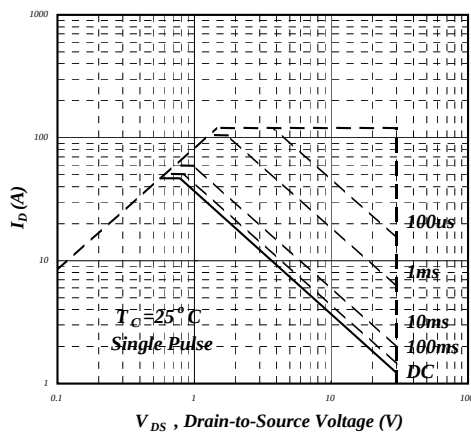


Fig 9. Maximum Safe Operating Area

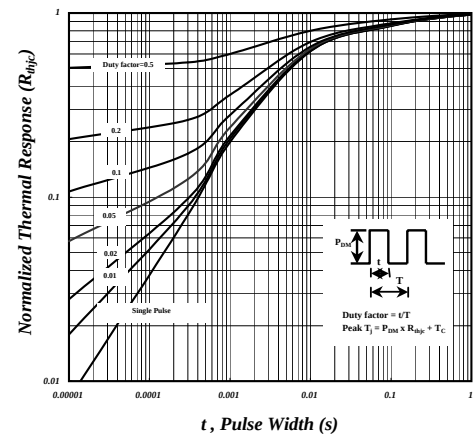


Fig10. Effective Transient Thermal Impedance

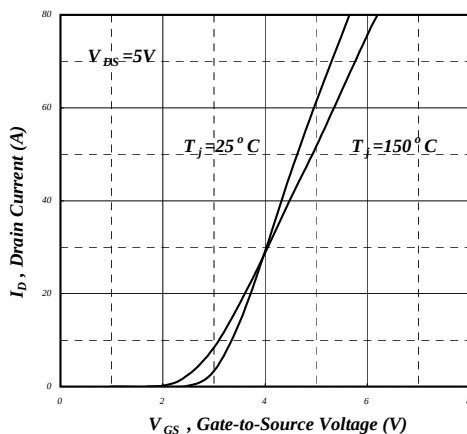


Fig 11. Transfer Characteristics

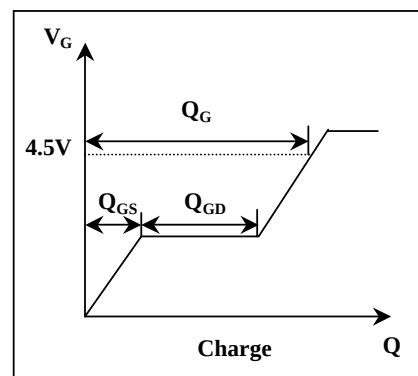


Fig 12. Gate Charge Waveform