



**Advanced Power
Electronics Corp.**

AP9962GMA

Pb Free Plating Product

N-CHANNEL ENHANCEMENT MODE

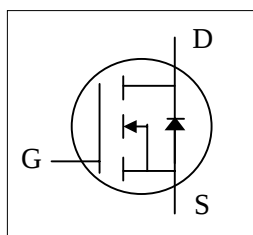
POWER MOSFET

▼ SO-8 similar area footprint and pin assignment

▼ Low Gate Charge

▼ Fast Switching Speed

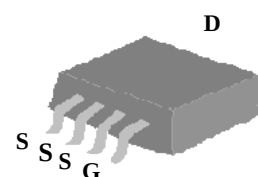
▼ RoHS Compliant



BV_{DSS}	40V
$R_{DS(ON)}$	20m Ω
I_D	36A

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	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	36	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	23	A
I_{DM}	Pulsed Drain Current ¹	120	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	37	W
	Linear Derating Factor	0.29	W/ $^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Thermal Resistance Junction-case	Max. 3.4	$^{\circ}C/W$
Rthj-a	Thermal Resistance Junction-ambient ³	Max. 85	$^{\circ}C/W$



AP9962GMA

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	40	-	-	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	-	-	20	mΩ
		V _{GS} =4.5V, I _D =16A	-	-	30	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.8	-	2.5	V
g _{fs}	Forward Transconductance ²	V _{DS} =10V, I _D =20A	-	20	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =40V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _j =150°C)	V _{DS} =32V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} = ±20V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =20A	-	14	22	nC
Q _{gs}	Gate-Source Charge	V _{DS} =30V	-	3	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	9	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =20V	-	8	-	ns
t _r	Rise Time	I _D =20A	-	48	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	23	-	ns
t _f	Fall Time	R _D =1Ω	-	7	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1160	1860	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	165	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	110	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.5	2.25	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =20A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ²	I _S =20A, V _{GS} =0V,	-	31	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	25	-	nC

Notes:

- 1.Pulse width limited by safe operating area.
- 2.Pulse width ≤300us , duty cycle ≤2%.
- 3.Surface mounted on FR4 board.

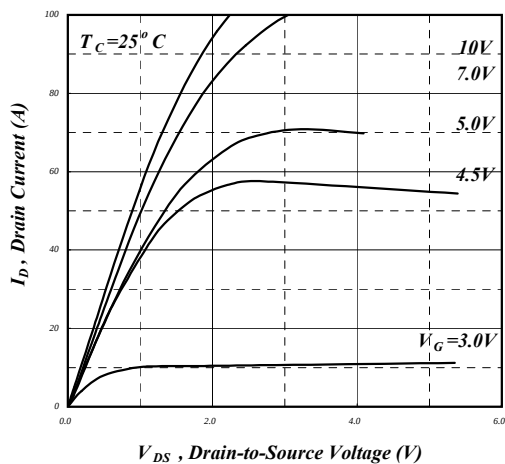


Fig 1. Typical Output Characteristics

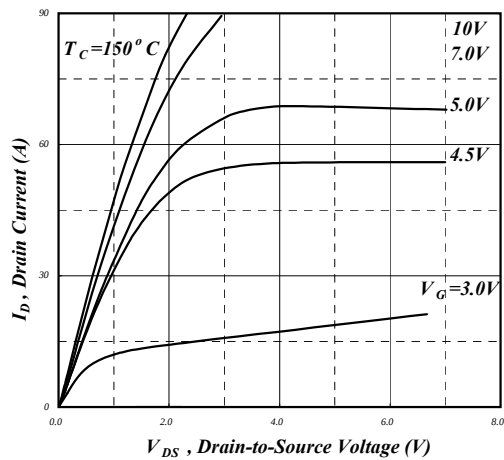


Fig 2. Typical Output Characteristics

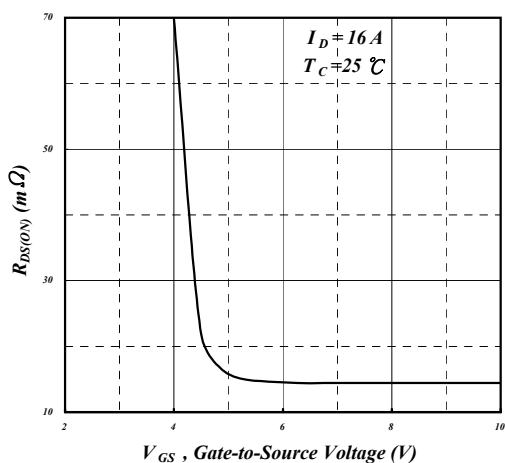


Fig 3. On-Resistance v.s. Gate Voltage

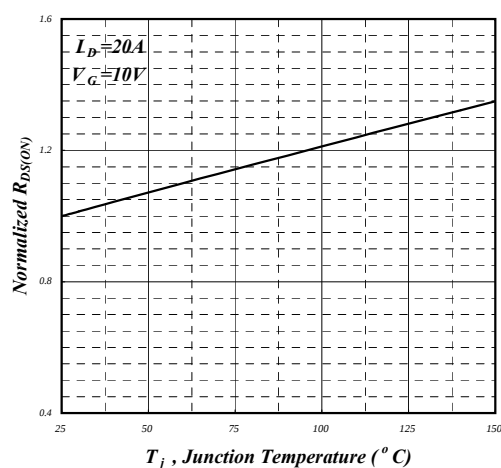


Fig 4. Normalized On-Resistance v.s. Junction Temperature

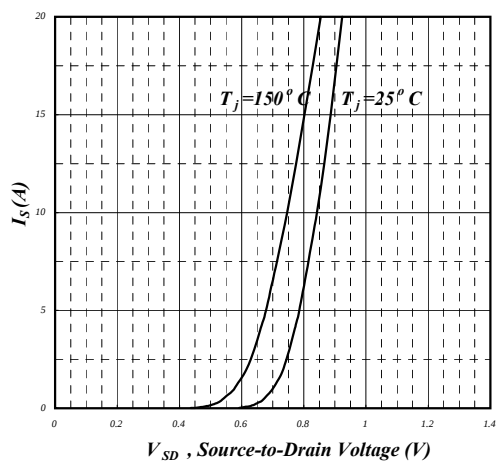


Fig 5. Forward Characteristic of Reverse Diode

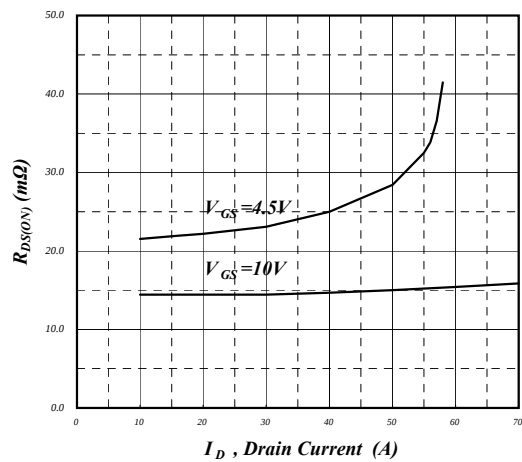


Fig 6. On-Resistance vs. Drain Current

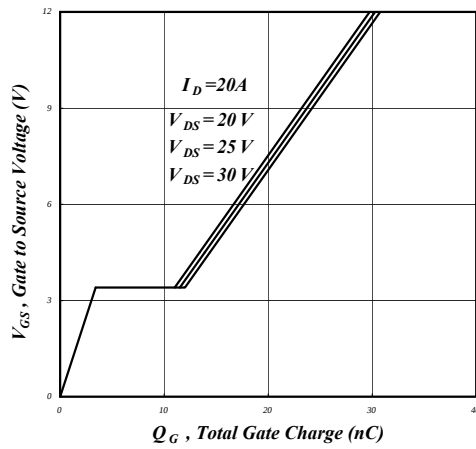


Fig7. Gate Charge Characteristics

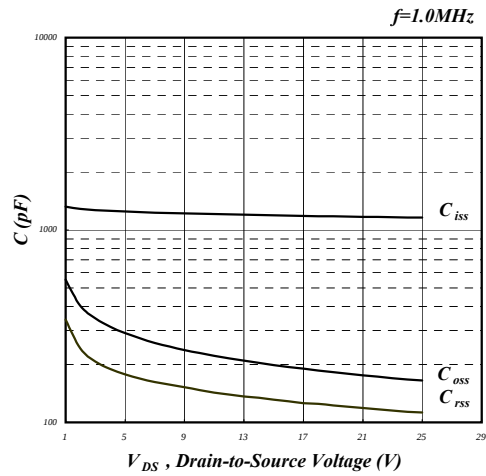


Fig 8. Typical Capacitance Characteristics

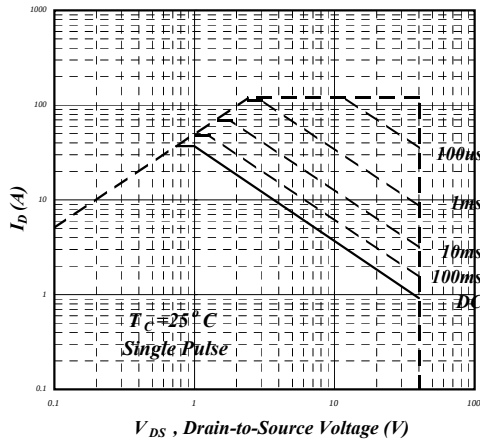


Fig 9. Maximum Safe Operating Area

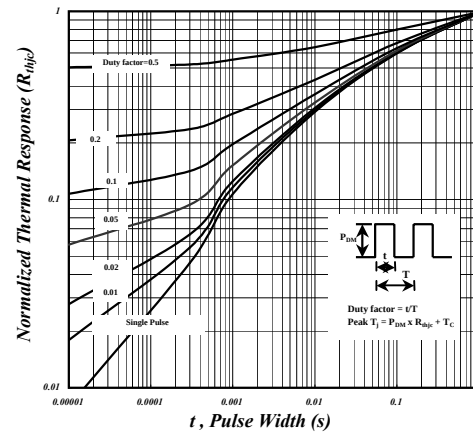


Fig10. Effective Transient Thermal Impedance

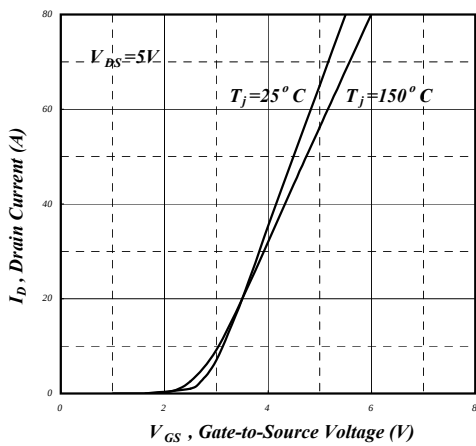


Fig 11. Transfer Characteristics

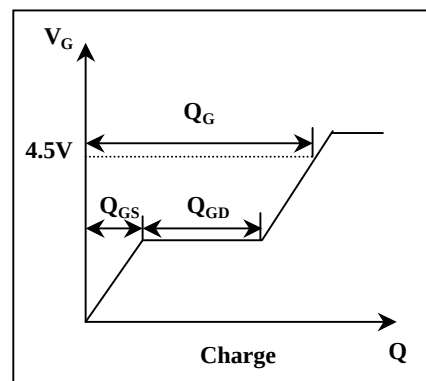


Fig 12. Gate Charge Waveform