AP9962GMA

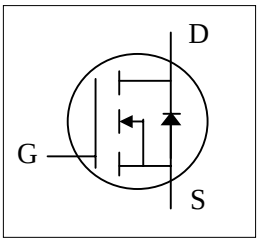
Pb Free Plating Product

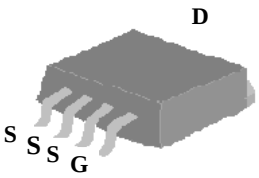
Advanced Power Electronics Corp.

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
$R_{DS(ON)}$	20mΩ
I_D	36A





APAK-5

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.

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℃	Continuous Drain Current, V_{GS} @ 10V	36	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	23	A
I_{DM}	Pulsed Drain Current[1]	120	A
P_D@T_C=25℃	Total Power Dissipation	37	W
	Linear Derating Factor	0.29	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter		Value	Units
Rthj-c	Thermal Resistance Junction-case	Max.	3.4	℃/W
Rthj-a	Thermal Resistance Junction-ambient[3]	Max.	85	℃/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	40	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=1mA	-	0.02	-	V/℃
$R_{DS(ON)}$	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.

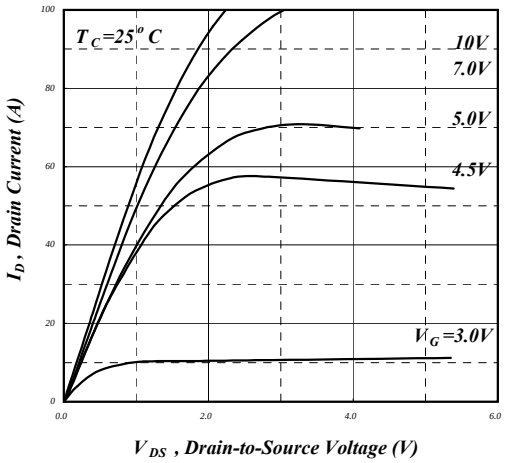


Fig 1. Typical Output Characteristics

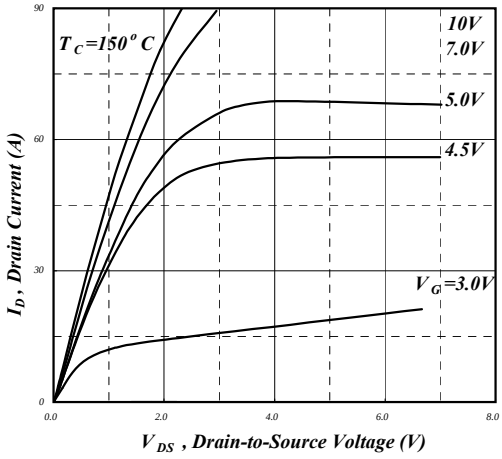


Fig 2. Typical Output Characteristics

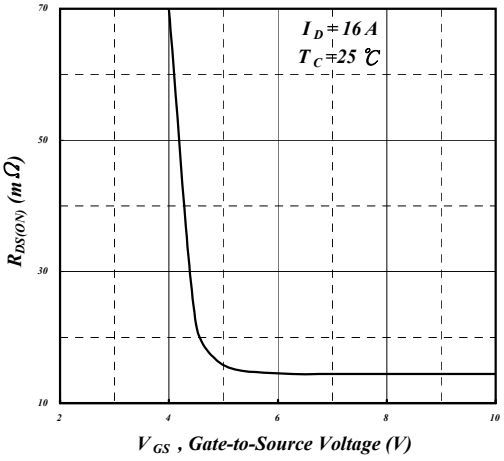


Fig 3. On-Resistance v.s. Gate Voltage

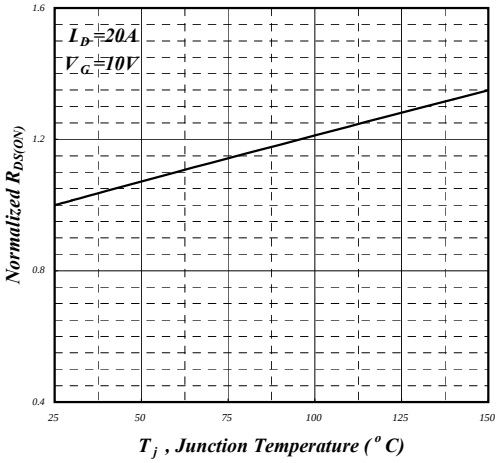


Fig 4. Normalized On-Resistance v.s. Junction Temperature

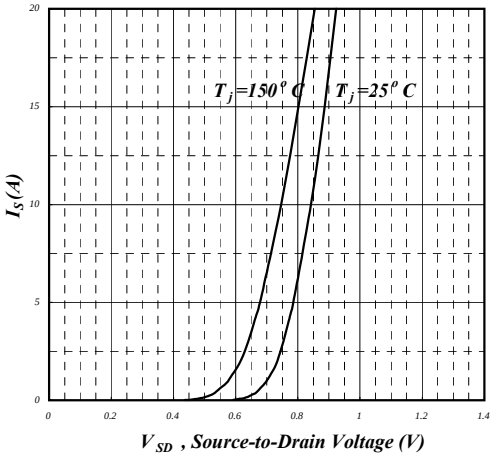


Fig 5. Forward Characteristic of Reverse Diode

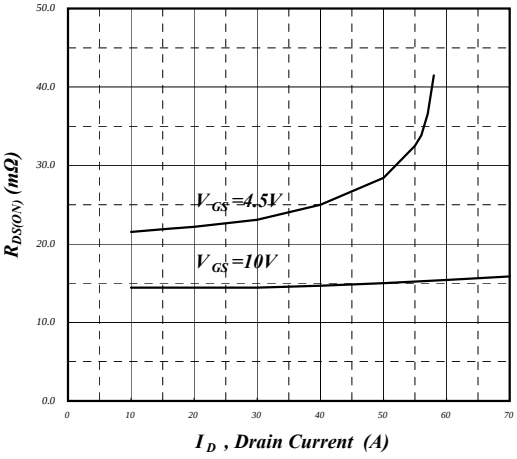


Fig 6. On-Resistance vs. Drain Current

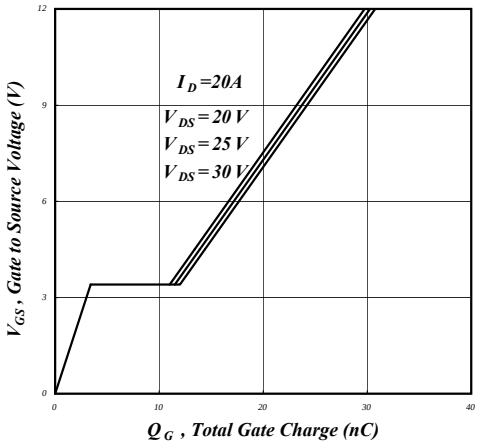


Fig7. Gate Charge Characteristics

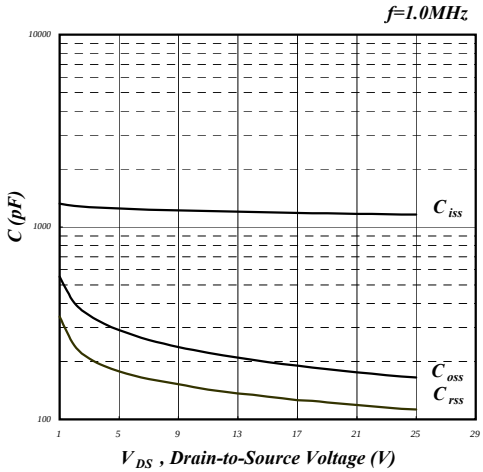


Fig 8. Typical Capacitance Characteristics

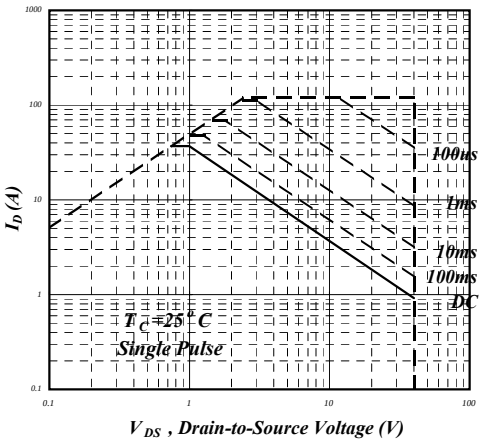


Fig 9. Maximum Safe Operating Area

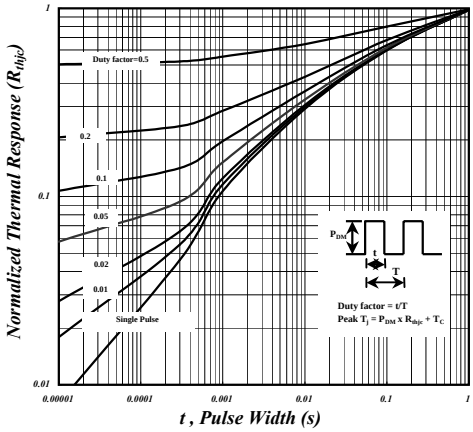


Fig10. Effective Transient Thermal Impedance

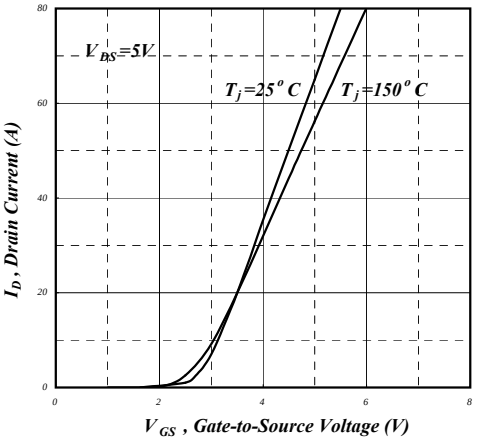


Fig 11. Transfer Characteristics

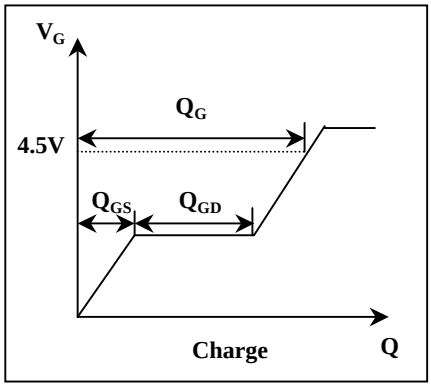


Fig 12. Gate Charge Waveform