AP9972GR-HF

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

▼ **Lower Gate Charge**

▼ **Simple Drive Requirement**

▼ **Fast Switching Characteristic**

▼ **RoHS Compliant & Halogen-Free**
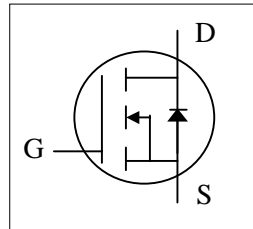
BV_{DSS}	60V
$R_{DS(ON)}$	18mΩ
I_D	60A

Description

AP9972 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.

TO-262(R)
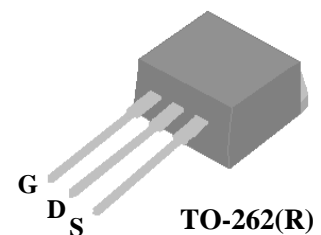
Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	$\pm$25	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	60	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	38	A
I_{DM}	Pulsed Drain Current[1]	230	A
P_D@T_C=25℃	Total Power Dissipation	89	W
E_{AS}	Single Pulse Avalanche Energy[3]	45	mJ
I_{AR}	Avalanche Current[3]	30	A
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	Maximum Thermal Resistance, Junction-case	1.4	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62	℃/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	60	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=35A	-	-	18	mΩ
		V_{GS}=4.5V, I_D=25A	-	-	22	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1	-	3	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=35A	-	55	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=48V, V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=$\pm$25V, V_{DS}=0V	-	-	$\pm$100	nA
Q_g	Total Gate Charge	I_D=35A	-	32	51	nC
Q_{gs}	Gate-Source Charge	V_{DS}=48V	-	8	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	20	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=30V	-	11	-	ns
t_r	Rise Time	I_D=35A	-	58	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	45	-	ns
t_f	Fall Time	V_{GS}=10V	-	80	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	3170	5070	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	280	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	230	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1.7	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=35A, V_{GS}=0V	-	-	1.2	V
t_{rr}	Reverse Recovery Time	I_S=35A, V_{GS}=0V,	-	50	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/µs	-	48	-	nC

Notes:
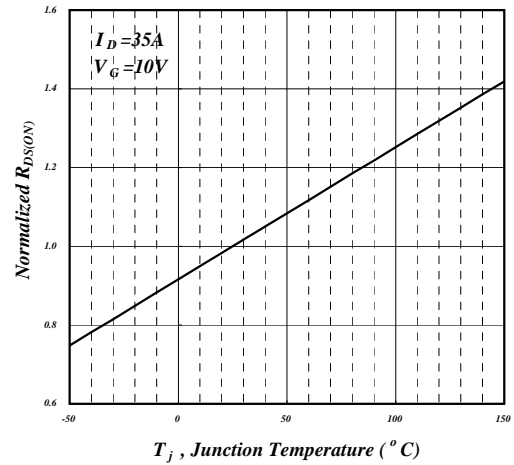
1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Starting T_j=25°C , V_{DD}=30V , L=100uH , R_G=25Ω , I_{AS}=30A.

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

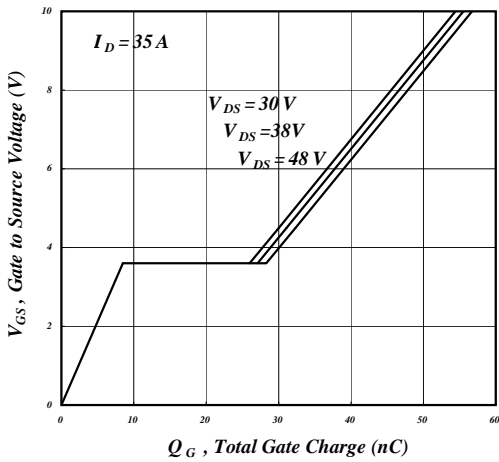**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**
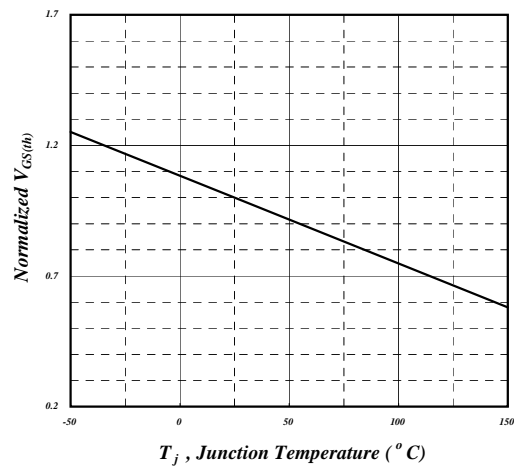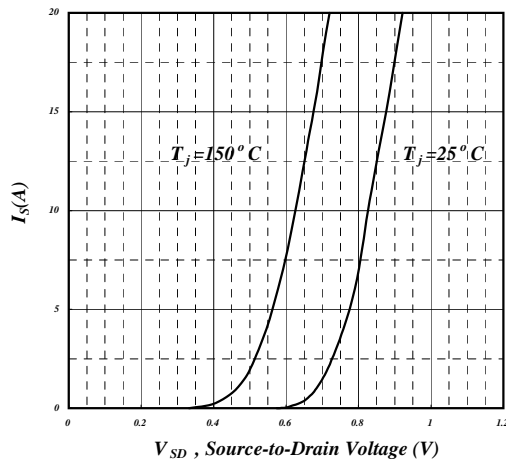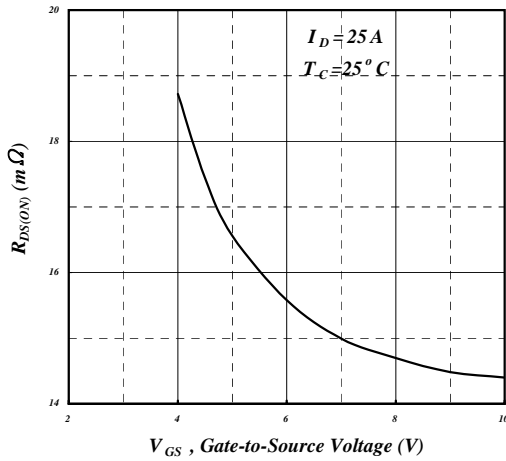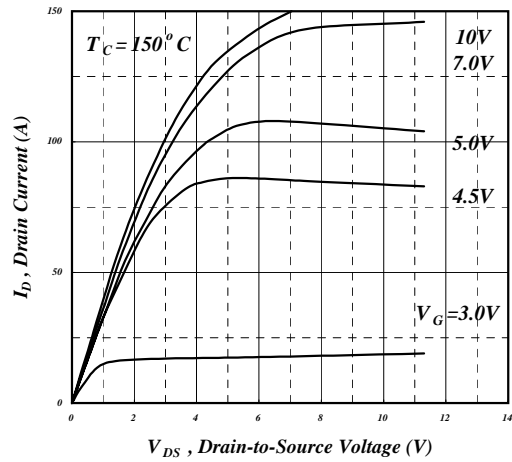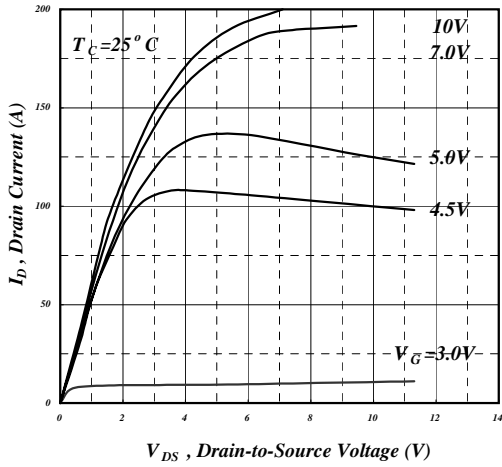
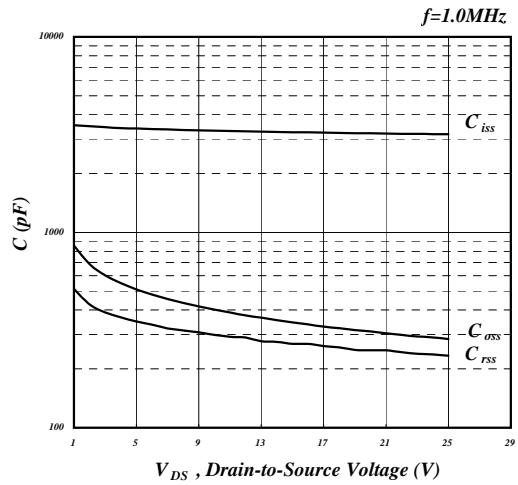Fig 7. Gate Charge Characteristics
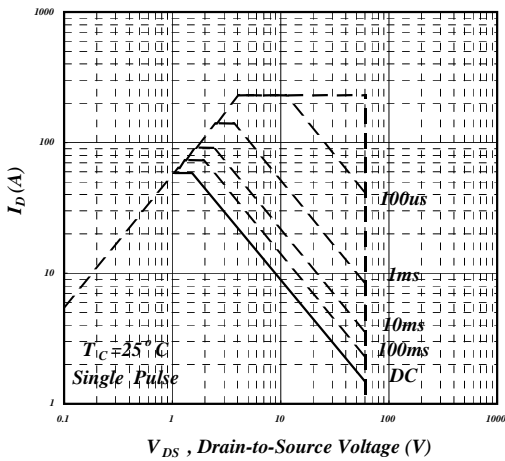

Fig 8. Typical Capacitance Characteristics
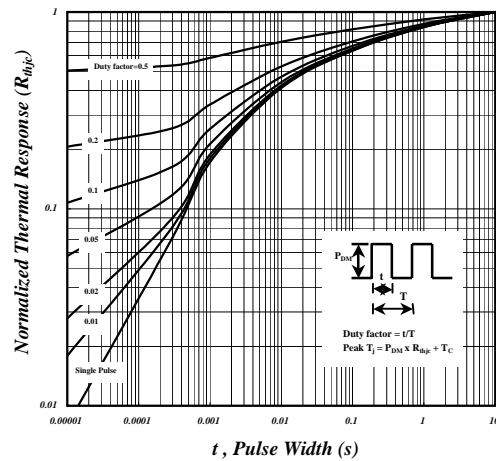

Fig 9. Maximum Safe Operating Area

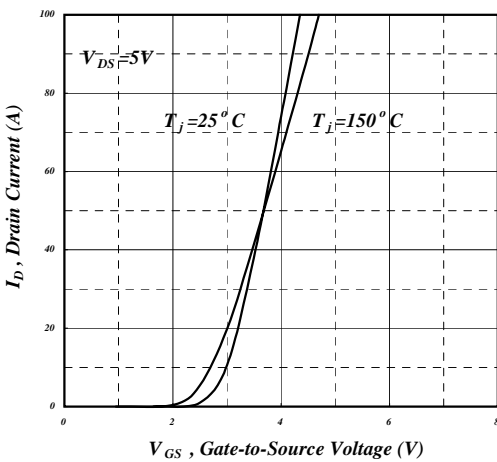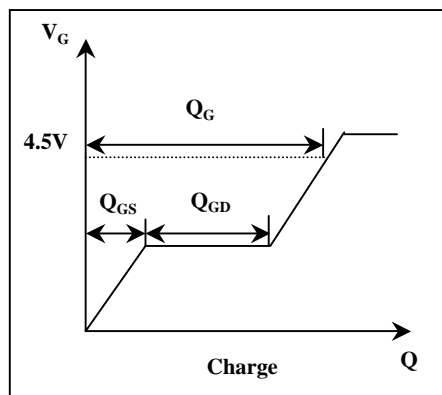Fig 10. Effective Transient Thermal Impedance

Fig 11. Transfer Characteristics

Fig 12. Gate Charge Waveform

MARKING INFORMATION

Part Number

meet Rohs requirement
for low voltage MOSFET only

9972GR

Package Code

YWWSSS

Date Code (YWWSSS)
      Y：Last Digit Of The Year
      WW：Week
      SSS：Sequence