



**Advanced Power
Electronics Corp.**

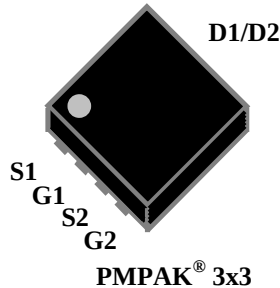
AP9938GEYT-HF

Halogen-Free Product

DUAL N CHANNEL ENHANCEMENT

MODE POWER MOSFET

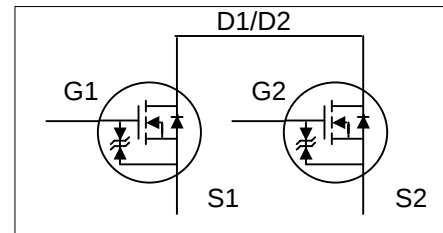
- ▼ Capable of 1.8V Gate Drive
- ▼ Good Thermal Performance
- ▼ Fast Switching Performance
- ▼ RoHS Compliant & Halogen-Free



BV_{DSS}	20V
$R_{DS(ON)}$	16m Ω
I_D	10A

Description

AP9938 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.



The PMPAK[®] 3x3 is special for voltage conversion application using standard infrared reflow technique with the backside heat sink to achieve the good thermal performance.

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 , V_{GS} @ 4.5V	10	A
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current ³ , V_{GS} @ 4.5V	8	A
I_{DM}	Pulsed Drain Current ¹	30	A
$P_D @ T_A = 25^\circ\text{C}$	Total Power Dissipation	2.5	W
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-c	Maximum Thermal Resistance, Junction-case	10	$^\circ\text{C/W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient ³	50	$^\circ\text{C/W}$



AP9938GEYT-HF

N-CH 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
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =4.5V, I _D =6A	-	13.2	16	mΩ
		V _{GS} =2.5V, I _D =4A	-	15.6	22	mΩ
		V _{GS} =1.8V, I _D =2A	-	18.8	26	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 =6A	-	28	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =16V, V _{GS} =0V	-	-	10	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±8V, V _{DS} =0V	-	-	±30	uA
Q _g	Total Gate Charge	I _D =6A	-	16	26	nC
Q _{gs}	Gate-Source Charge	V _{DS} =10V	-	1.5	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	4	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =10V	-	7	-	ns
t _r	Rise Time	I _D =1A	-	12	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	30	-	ns
t _f	Fall Time	V _{GS} =5V	-	5	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1067	1705	pF
C _{oss}	Output Capacitance	V _{DS} =10V	-	130	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	115	-	pF
R _g	Gate Resistance	f=1.0MHz	-	1.4	2.8	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =1.2A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time	I _S =6A, V _{GS} =0V,	-	11	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	4	-	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 ≤10sec, 90°C/W at steady state.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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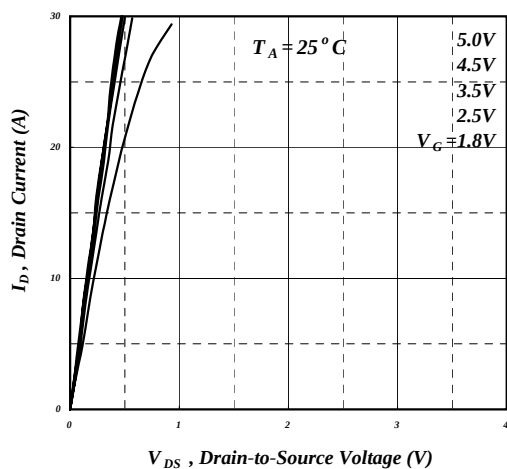


Fig 1. Typical Output Characteristics

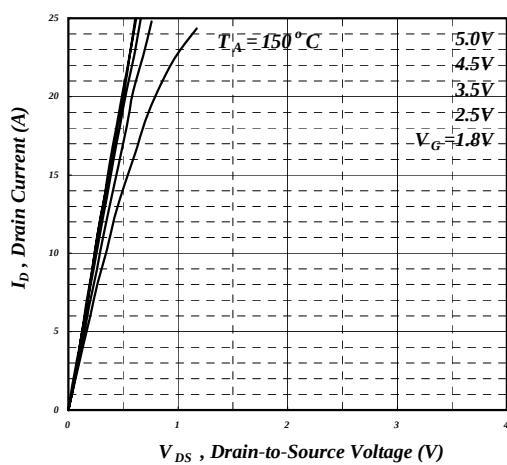


Fig 2. Typical Output Characteristics

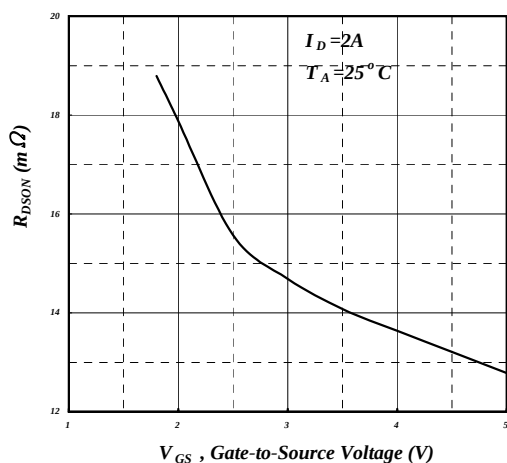


Fig 3. On-Resistance v.s. Gate Voltage

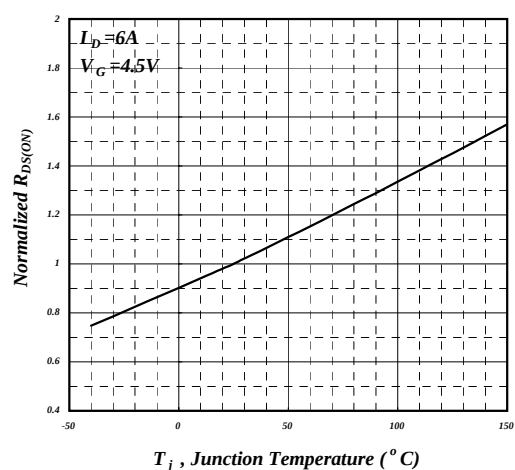


Fig 4. Normalized On-Resistance v.s. Junction Temperature

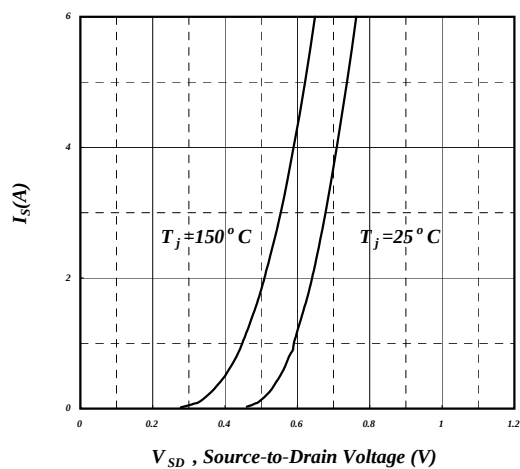


Fig 5. Forward Characteristic of Reverse Diode

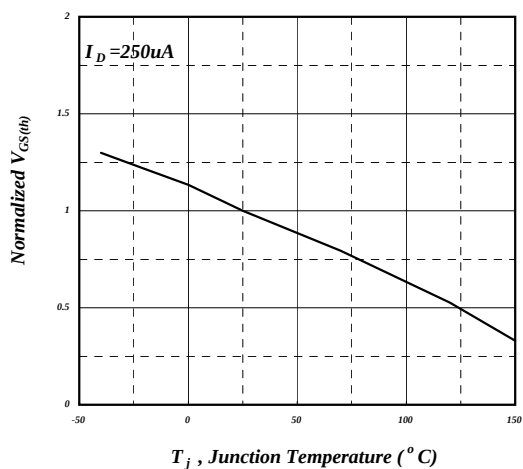


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

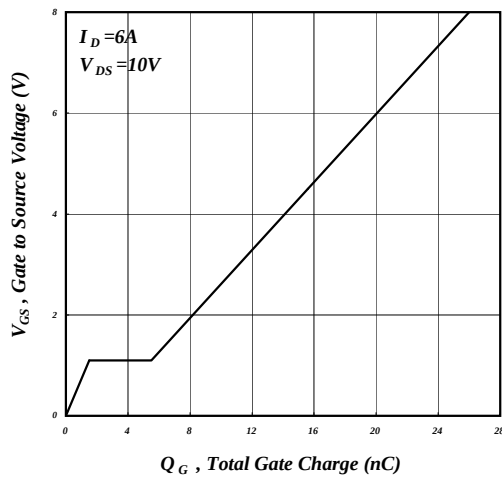


Fig 7. Gate Charge Characteristics

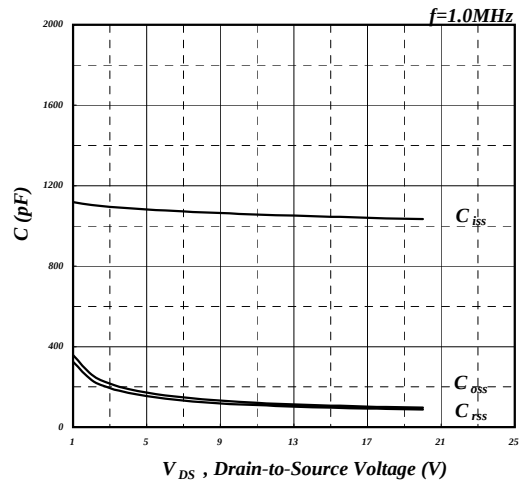


Fig 8. Typical Capacitance Characteristics

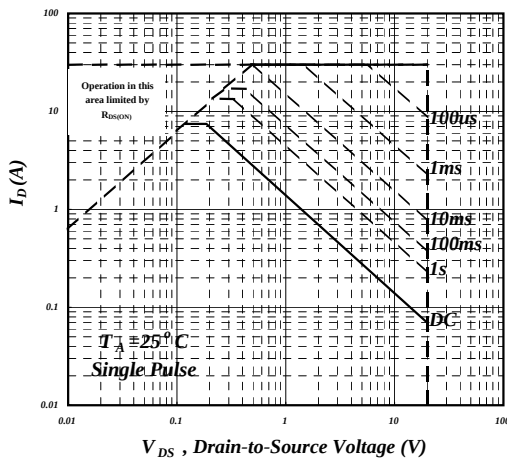


Fig 9. Maximum Safe Operating Area

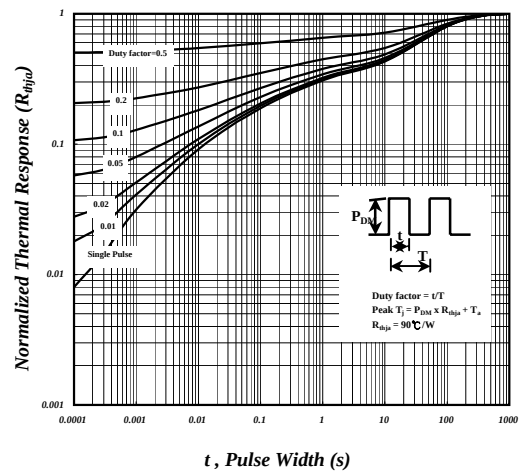


Fig 10. Effective Transient Thermal Impedance

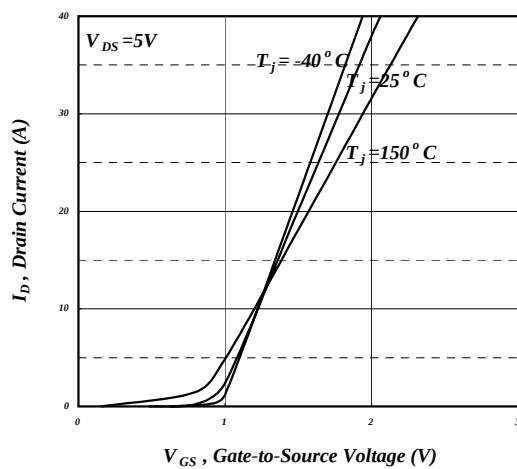


Fig 11. Transfer Characteristics

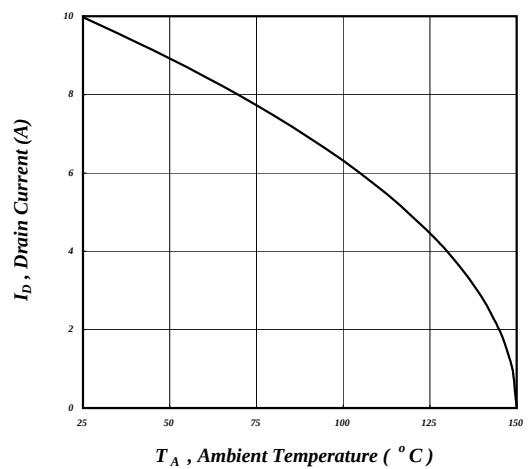


Fig 12. Maximum Continuous Drain Current v.s. Ambient Temperature