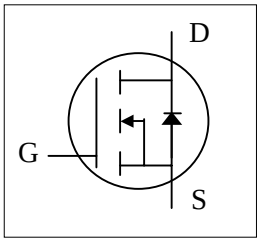
AP09T10GH-HF

Halogen-Free Product

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **Simple Drive Requirement**
- ▼ **Lower Gate Charge**
- ▼ **Fast Switching Characteristic**
- ▼ **Halogen Free & RoHS Compliant Product**

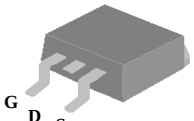


BV_{DSS}	100V
$R_{DS(ON)}$	300mΩ
I_D	4.4A

Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-252 package is widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



TO-252(H)

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	4.4	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	2.8	A
I_{DM}	Pulsed Drain Current[1]	12	A
P_D@T_C=25℃	Total Power Dissipation	12.5	W
P_D@T_A=25℃	Total Power Dissipation[3]	2	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	Maximum Thermal Resistance, Junction-case	10	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[3]	62.5	℃/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	100	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=3A	-	-	300	mΩ
		V_{GS}=4.5V, I_D=1.5A	-	-	600	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=3A	-	3	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V, V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=3A	-	5.5	8.8	nC
Q_{gs}	Gate-Source Charge	V_{DS}=80V	-	1.2	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	2.2	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V	-	6.5	-	ns
t_r	Rise Time	I_D=3A	-	8	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	10	-	ns
t_f	Fall Time	V_{GS}=10V	-	3	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	190	300	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	30	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	20	-	pF
R_g	Gate Resistance	f=1.0MHz	1	2	4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=3A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_S=3A, V_{GS}=0V,	-	31	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	47	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board

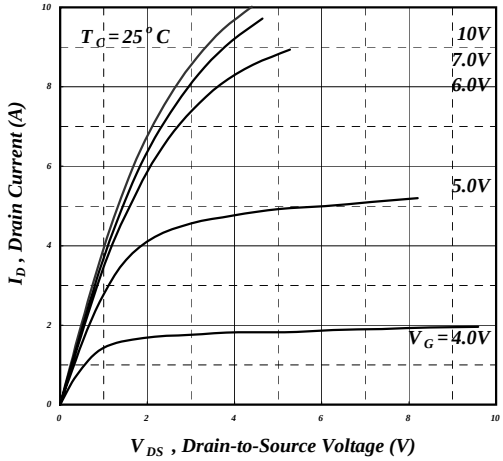


Fig 1. Typical Output Characteristics

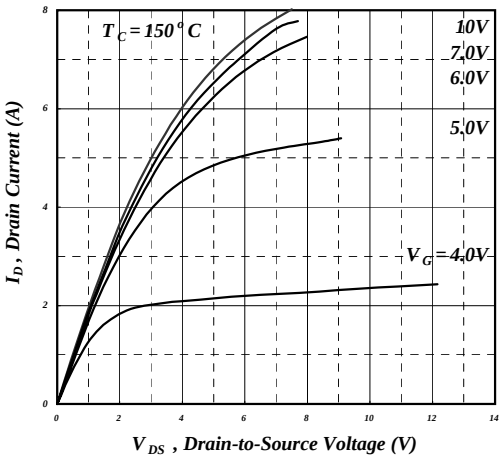


Fig 2. Typical Output Characteristics

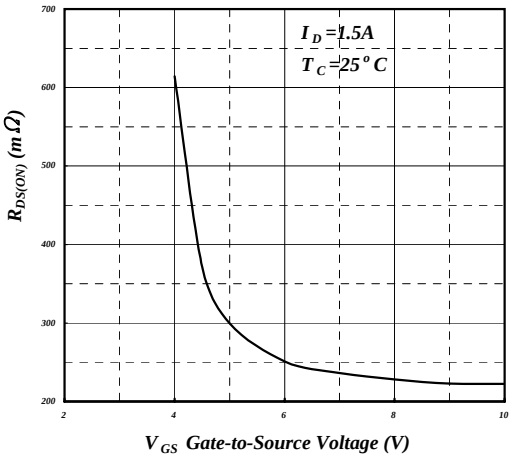


Fig 3. On-Resistance v.s. Gate Voltage

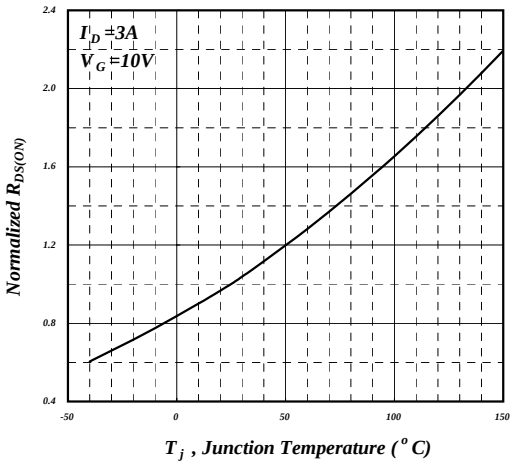


Fig 4. Normalized On-Resistance v.s. Junction Temperature

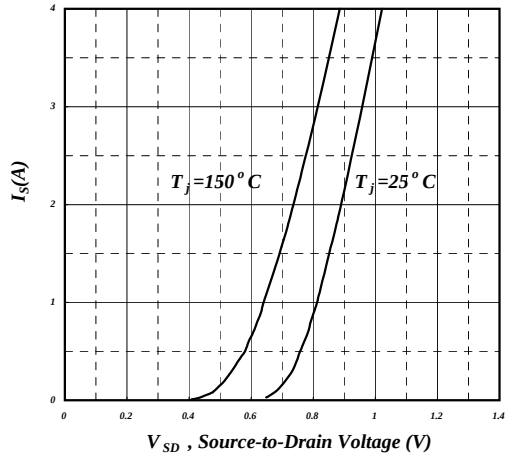


Fig 5. Forward Characteristic of Reverse Diode

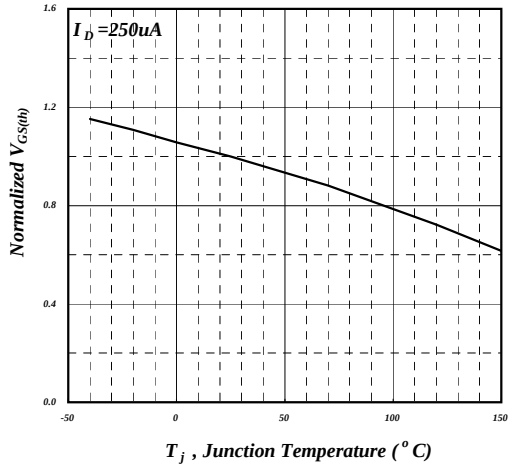


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

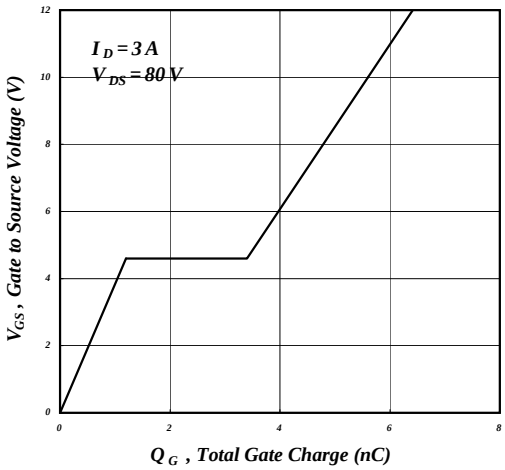


Fig 7. Gate Charge Characteristics

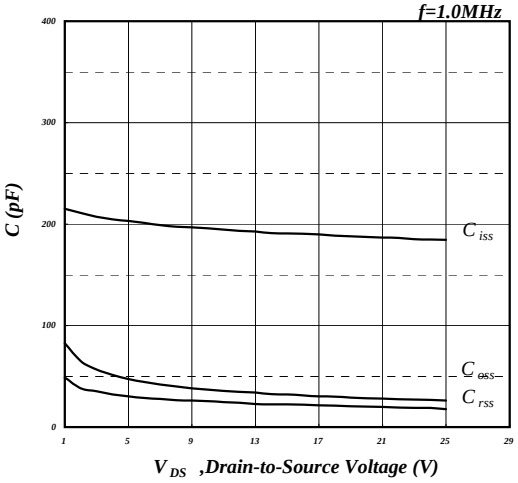


Fig 8. Typical Capacitance Characteristics

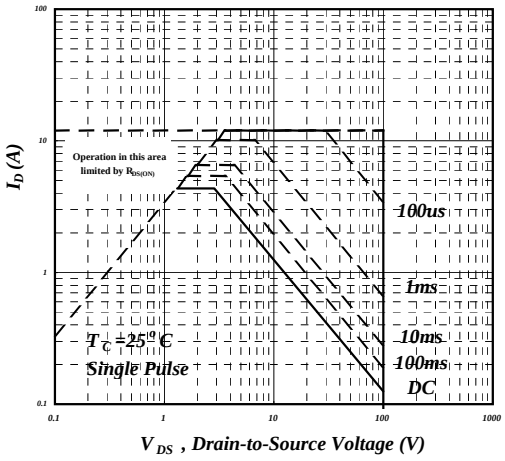


Fig 9. Maximum Safe Operating Area

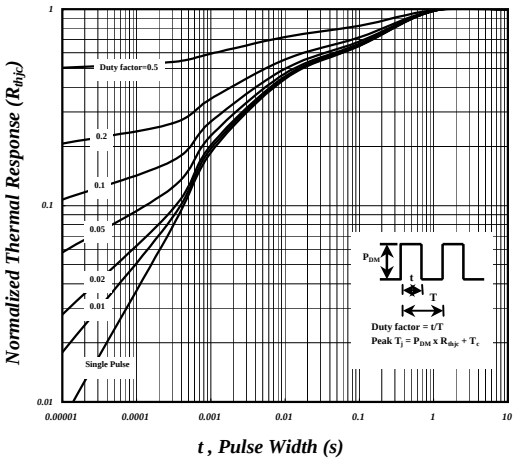


Fig 10. Effective Transient Thermal Impedance

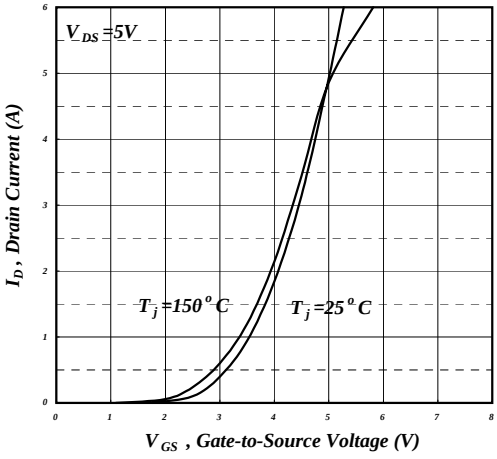


Fig 11. Transfer Characteristics

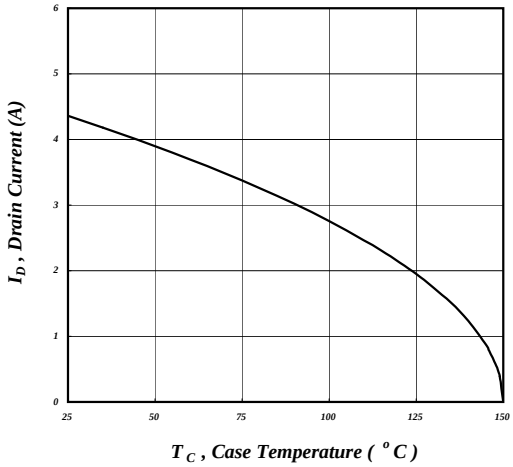
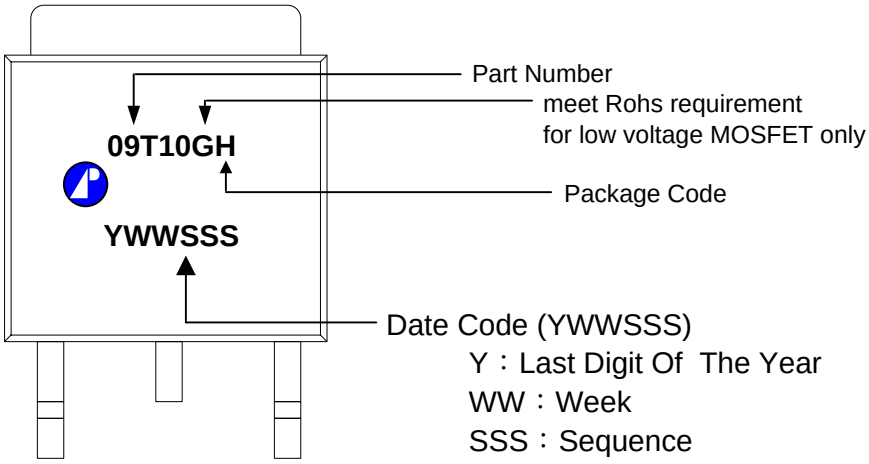
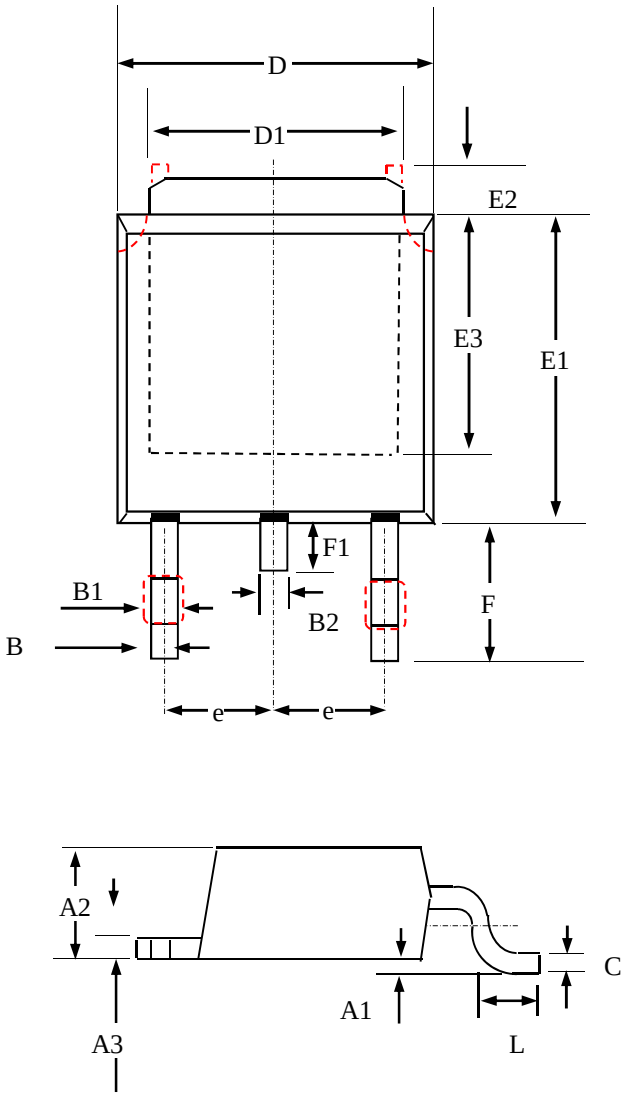


Fig 12. Drain Current v.s. Case Temperature

MARKING INFORMATION



Package Outline : TO-252



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	2.18	2.30	2.40
A3	0.40	0.50	0.65
B	0.40	0.70	1.00
B1	0.50	0.85	1.20
D	6.00	6.50	6.80
D1	4.80	5.35	5.90
E3	4.00 (ref.)		
F	2.00	2.63	3.05
F1	0.50	0.85	1.20
E1	5.00	5.70	6.30
E2	0.50	1.10	1.80
e	2.3 (ref)		
C	0.35	0.525	0.70
A1	0.00	—	0.25
B2	—	—	1.25
L	0.90	1.34	1.78

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

3. Thermal PAD, Body and Pin contour is for reference, it may has little difference by option.

Draw No. M1-H3EFIMT-G-v10

TO-252 FOOTPRINT：