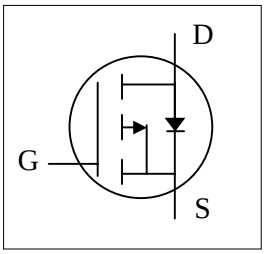
AP9435GH/J

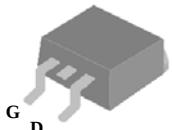
Advanced Power Electronics Corp.

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

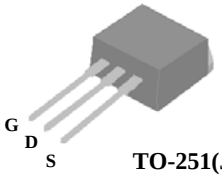
- ▼ **Low Gate Charge**
- ▼ **Simple Drive Requirement**
- ▼ **Fast Switching**



BV_{DSS}	-30V
$R_{DS(ON)}$	50mΩ
I_D	- 20A



TO-252(H)



TO-251(J)

Description

Advanced Power MOSFETs utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The TO-252/TO-251 package is widely used for commercial-industrial application.

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	- 30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	- 20	A
I_D@T_C=100℃	Continuous Drain Current	-13	A
I_{DM}	Pulsed Drain Current[1]	-60	A
P_D@T_C=25℃	Total Power Dissipation	12.5	W
	Linear Derating Factor	0.1	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	110	℃/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	-30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V, I_D=-10A	-	-	50	mΩ
		V_{GS}=-4.5V, I_D=-5A	-	-	90	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=-10A	-	10	-	S
I_{DSS}	Drain-Source Leakage Current (T_j=25°C)	V_{DS}=-30V, V_{GS}=0V	-	-	-1	uA
	Drain-Source Leakage Current (T_j=150°C)	V_{DS}=-24V, V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=± 20V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=-10A	-	8	16	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-24V	-	1.6	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	4.3	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-15V	-	6.3	-	ns
t_r	Rise Time	I_D=-10A	-	46	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω,V_{GS}=-10V	-	20	-	ns
t_f	Fall Time	R_D=1.5Ω	-	7.4	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	570	740	pF
C_{oss}	Output Capacitance	V_{DS}=-25V	-	80	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	75	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=-10A, V_{GS}=0V	-	-	-1.3	V
t_{rr}	Reverse Recovery Time[2]	I_S=-10A, V_{GS}=0V,	-	18	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=-100A/μs	-	10	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

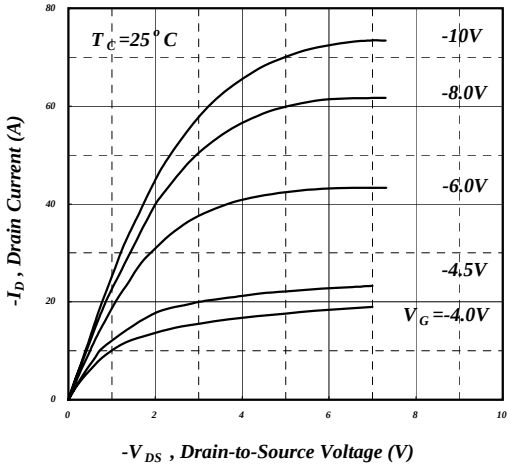


Fig 1. Typical Output Characteristics

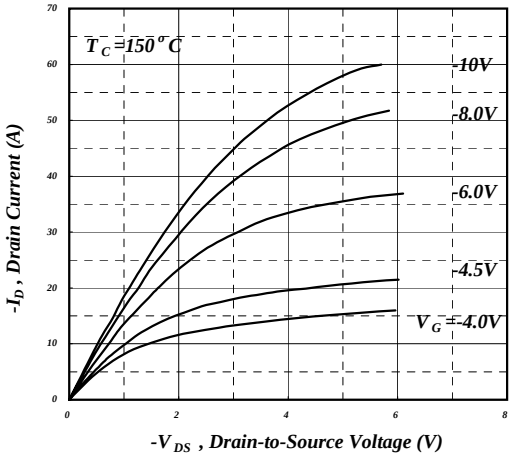


Fig 2. Typical Output Characteristics

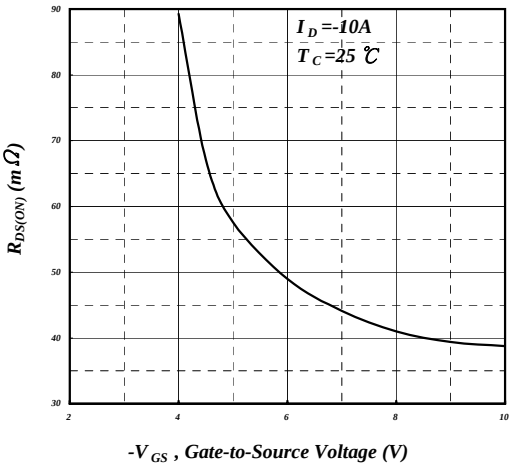


Fig 3. On-Resistance v.s. Gate Voltage

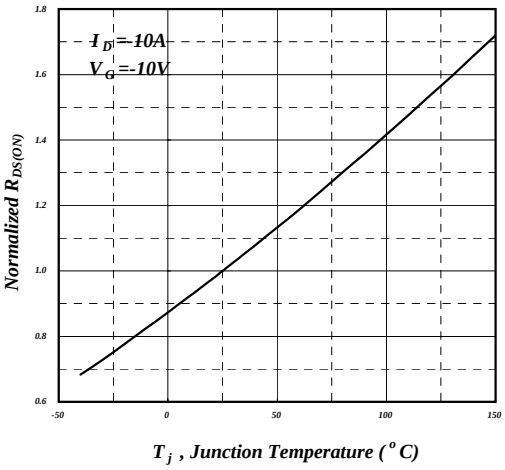


Fig 4. Normalized On-Resistance v.s. Junction Temperature

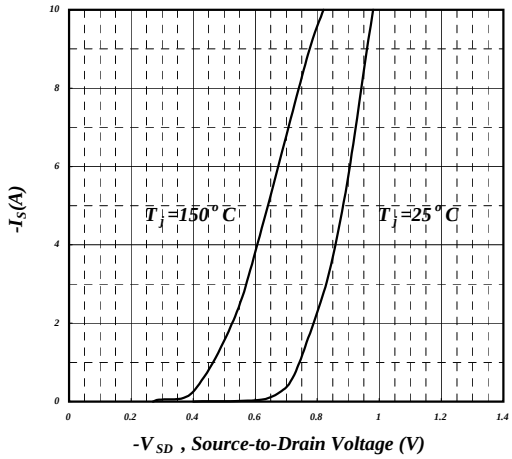


Fig5. Forward Characteristic of Reverse Diode

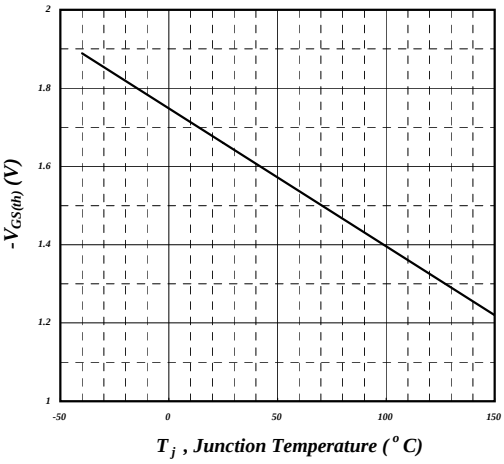


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

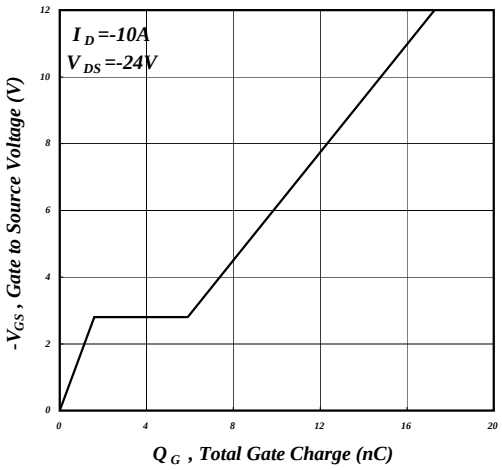


Fig 7. Gate Charge Characteristics

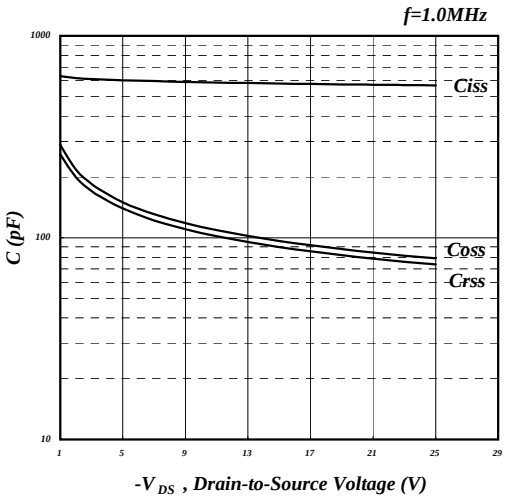


Fig 8. Typical Capacitance Characteristics

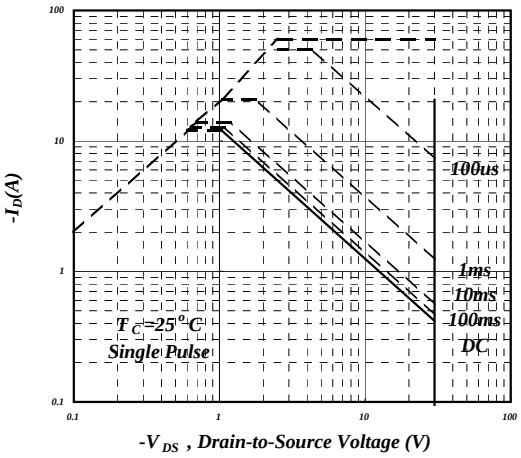


Fig 9. Maximum Safe Operating Area

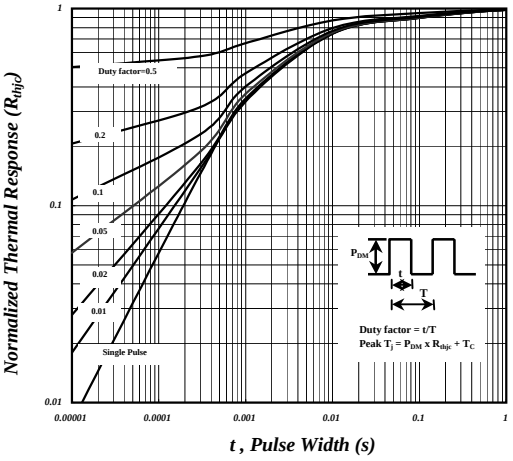


Fig 10. Effective Transient Thermal Impedance

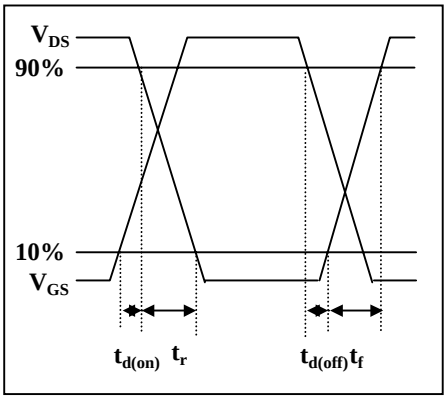


Fig 11. Switching Time Waveform

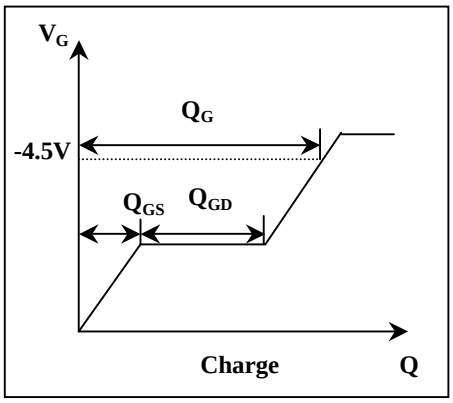
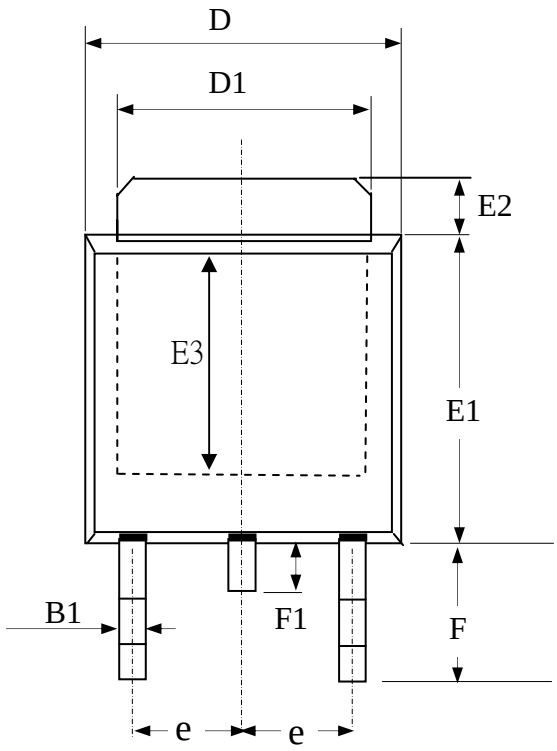


Fig 12. Gate Charge Waveform

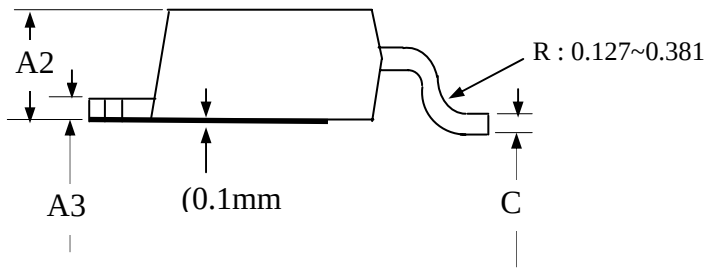
Package Outline : TO-252



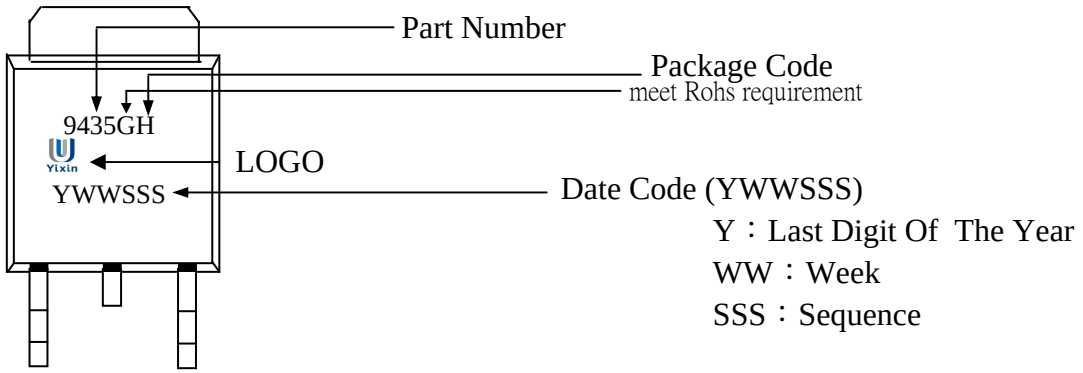
SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	1.80	2.30	2.80
A3	0.40	0.50	0.60
B1	0.40	0.70	1.00
D	6.00	6.50	7.00
D1	4.80	5.35	5.90
E3	3.50	4.00	4.50
F	2.20	2.63	3.05
F1	0.5	0.85	1.20
E1	5.10	5.70	6.30
E2	0.50	1.10	1.80
e	--	2.30	--
C	0.35	0.50	0.65

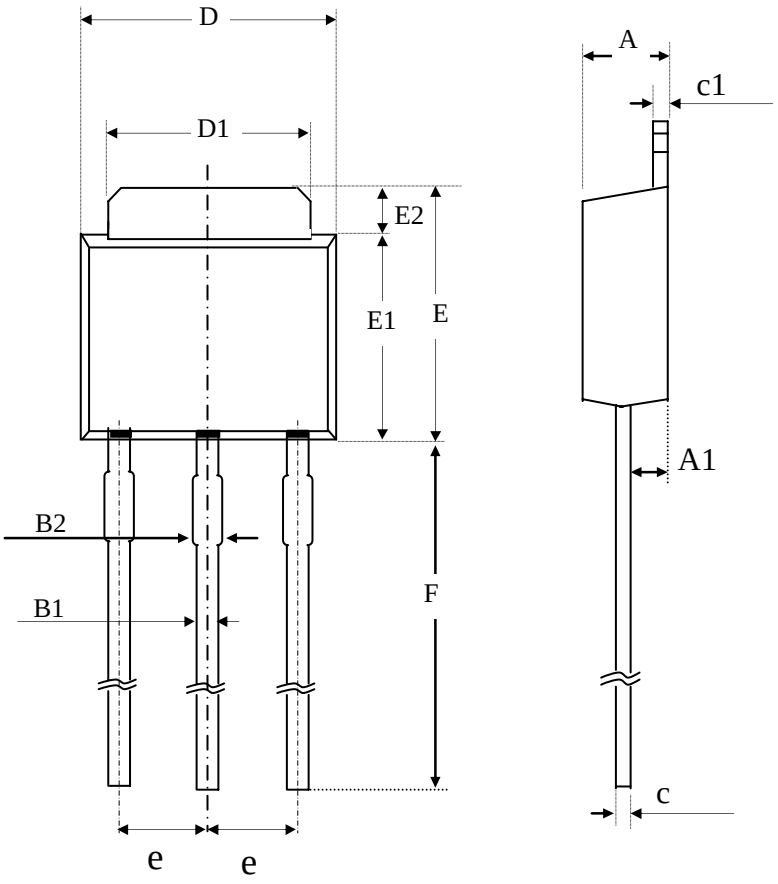
1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.



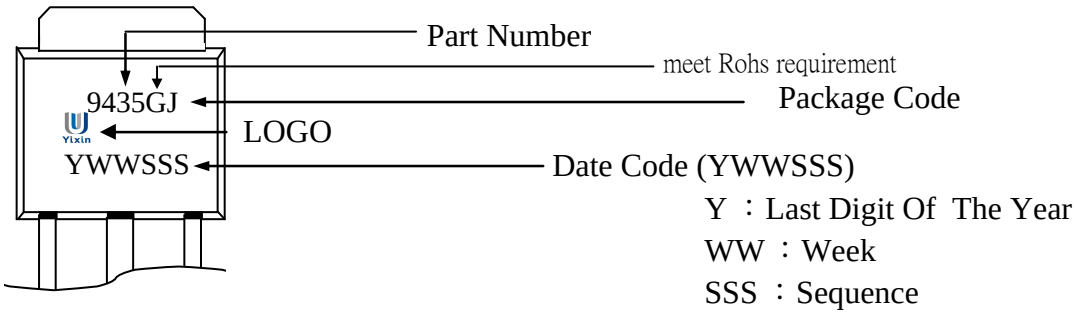
Part Marking Information & Packing : TO-252





SYMBOLS	Millimeters		
	MIN	NOM	MAX
	Original	Original	Original
A	2.10	2.30	2.50
A1	0.60	1.20	1.80
B1	0.40	0.60	0.80
B2	0.60	0.95	1.25
c	0.40	0.50	0.65
c1	0.40	0.55	0.70
D	6.00	6.50	7.00
D1	4.80	5.40	5.90
E1	5.00	5.50	6.00
E2	1.20	1.70	2.20
e	----	2.30	----
F	7.00	---	16.70

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.

Part Marking Information & Packing ： TO-251