



**Advanced Power
Electronics Corp.**

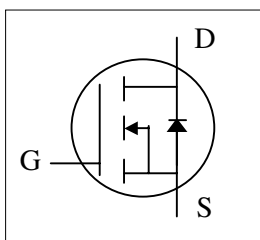
AP90T03GH/J

RoHS-compliant Product

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

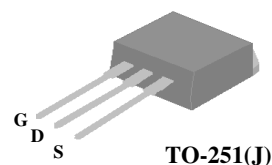
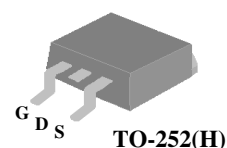
- ▼ Lower On- resistance
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic



BV_{DSS}	30V
$R_{DS(ON)}$	4m Ω
I_D	75A

Description

The TO-252 package is widely preferred for commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters. The through-hole version (AP90T03GJ) is available for low-profile applications.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	75	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	63	A
I_{DM}	Pulsed Drain Current ¹	350	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	96	W
	Linear Derating Factor	0.7	W/ $^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	1.3	$^{\circ}C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	$^{\circ}C/W$



AP90T03GH/J

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 =250μA	30	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =45A	-	-	4	mΩ
		V _{GS} =4.5V, I _D =30A	-	-	6	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.8	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =30A	-	55	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V, V _{GS} =0V	-	-	1	μA
	Drain-Source Leakage Current (T _j =150°C)	V _{DS} =24V, V _{GS} =0V	-	-	25	μA
I _{GSS}	Gate-Source Leakage	V _{GS} = ±20V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =40A	-	60	96	nC
Q _{gs}	Gate-Source Charge	V _{DS} =24V	-	8.5		nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	38		nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =15V	-	14	-	ns
t _r	Rise Time	I _D =30A	-	83	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	66	-	ns
t _f	Fall Time	R _D =0.5Ω	-	120	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	4090	6540	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	1010	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	890	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =45A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ²	I _S =30A, V _{GS} =0V,	-	51	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	63	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

THIS PRODUCT IS AN ELECTROSTATIC SENSITIVE, PLEASE HANDLE WITH CAUTION.

THIS PRODUCT HAS BEEN QUALIFIED FOR CONSUMER MARKET. APPLICATIONS OR USES AS CRITERIAL COMPONENT IN LIFE SUPPORT DEVICE OR SYSTEM ARE NOT AUTHORIZED.

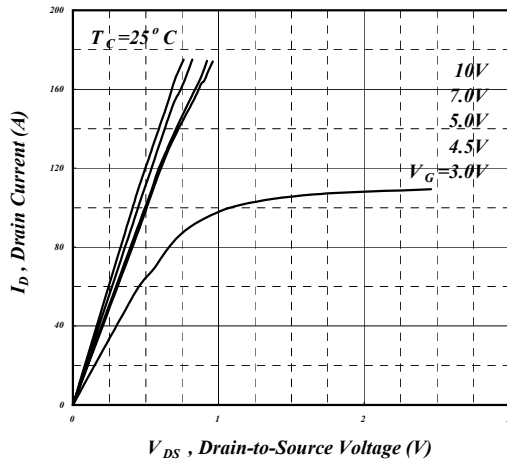


Fig 1. Typical Output Characteristics

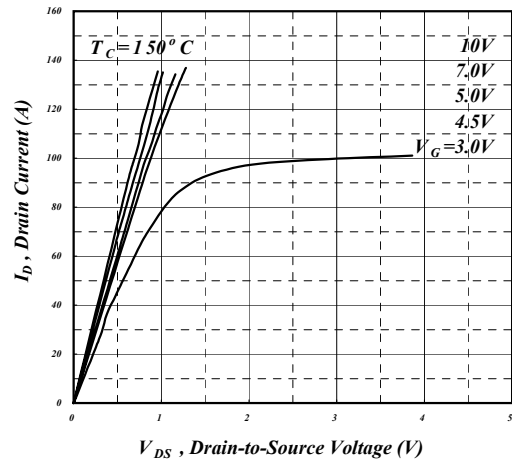


Fig 2. Typical Output Characteristics

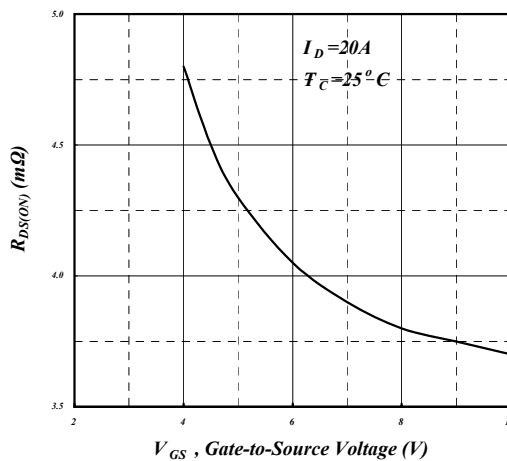


Fig 3. On-Resistance v.s. Gate Voltage

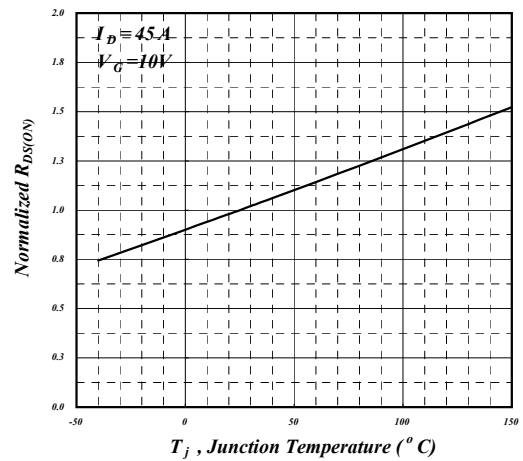


Fig 4. Normalized On-Resistance
v.s. Junction Temperature

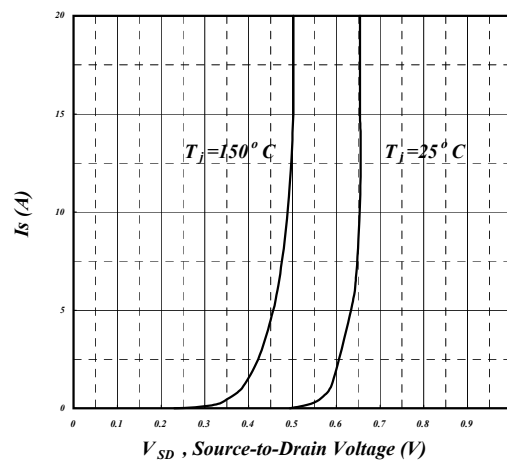


Fig 5. Forward Characteristic of
Reverse Diode

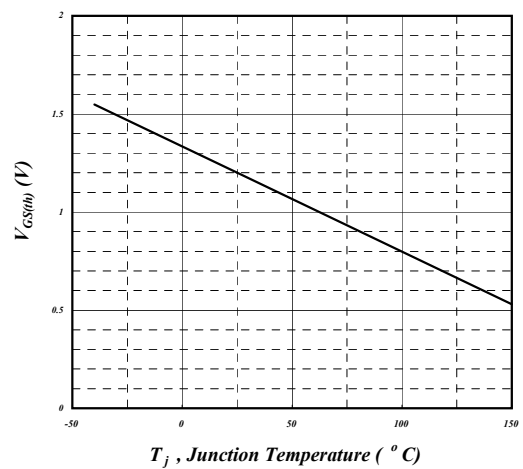


Fig 6. Gate Threshold Voltage v.s.
Junction Temperature

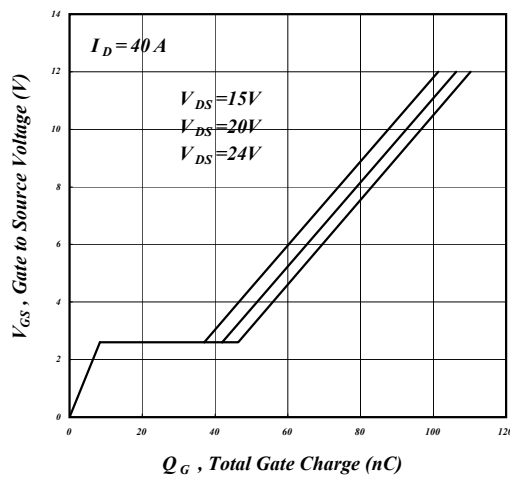


Fig 7. Gate Charge Characteristics

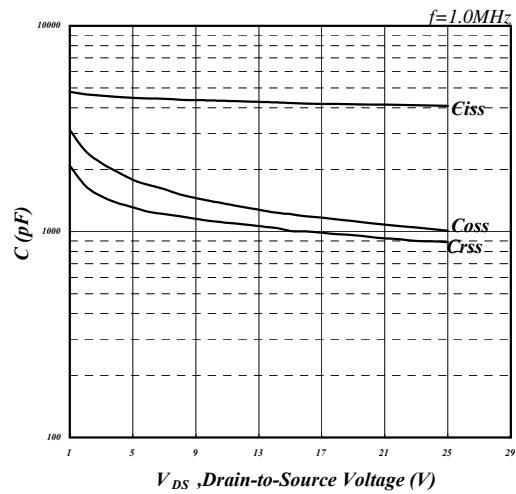


Fig 8. Typical Capacitance Characteristics

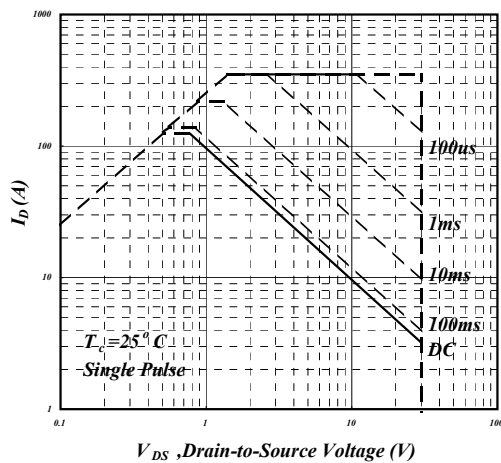


Fig 9. Maximum Safe Operating Area

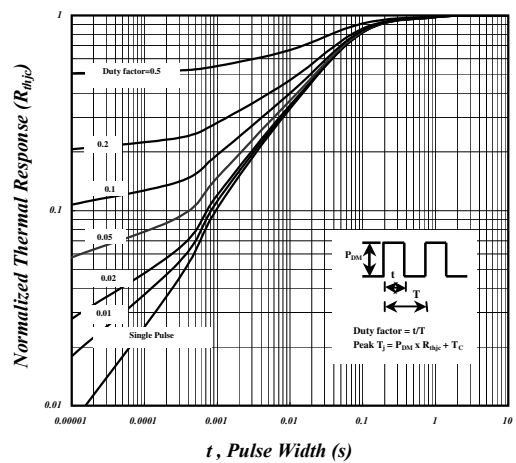


Fig 10. Effective Transient Thermal Impedance

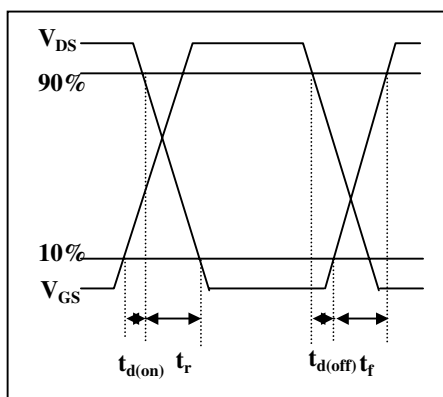


Fig 11. Switching Time Waveform

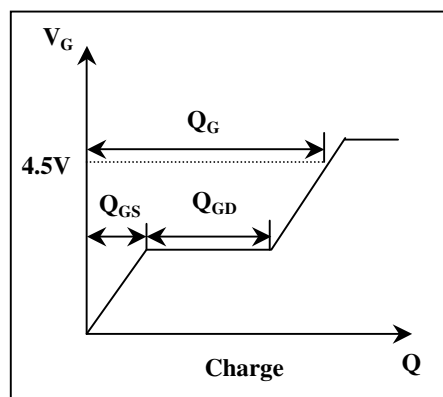
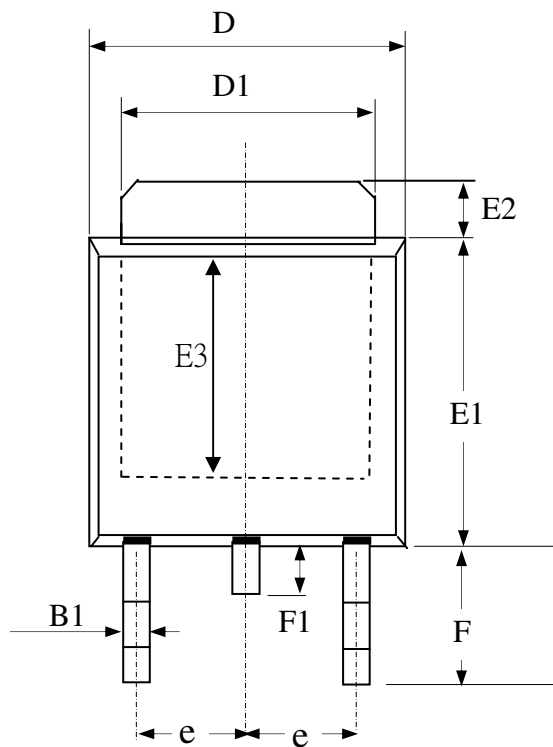


Fig 12. Gate Charge Waveform



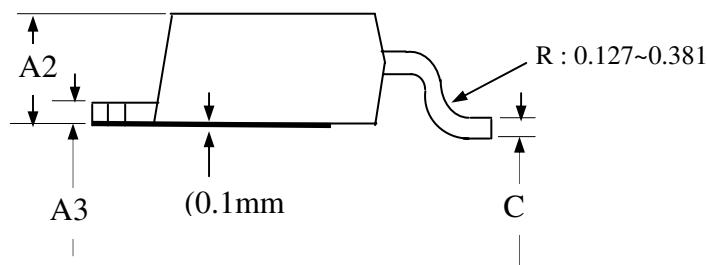
Package Outline : TO-252



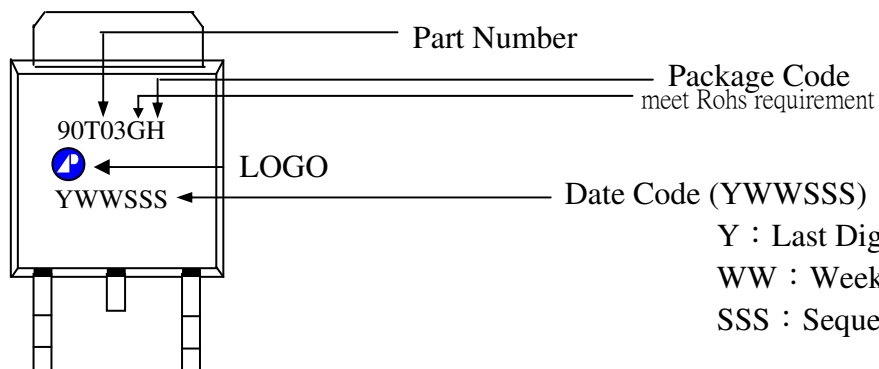
SYMBOLS	Millimeters		
	MIN	NOM	MAX
A2	1.80	2.30	2.80
A3	0.40	0.50	0.60
B1	0.40	0.70	1.00
D	6.00	6.50	7.00
D1	4.80	5.35	5.90
E3	3.50	4.00	4.50
F	2.20	2.63	3.05
F1	0.5	0.85	1.20
E1	5.10	5.70	6.30
E2	0.50	1.10	1.80
e	--	2.30	--
C	0.35	0.50	0.65

1.All Dimensions Are in Millimeters.

2.Dimension Does Not Include Mold Protrusions.



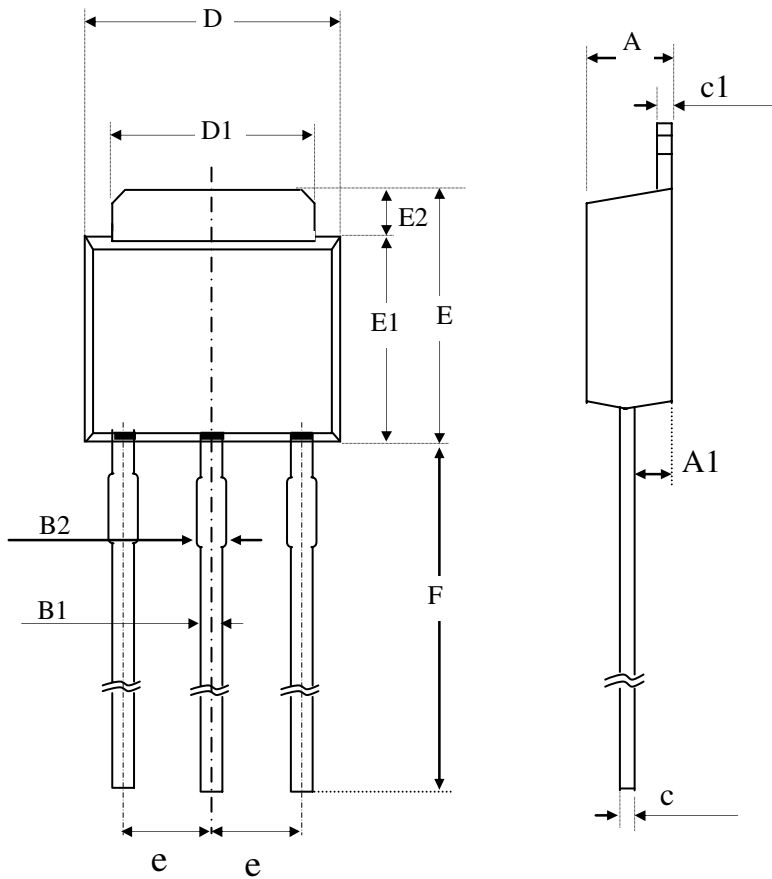
Part Marking Information & Packing : TO-252



Y : Last Digit Of The Year

WW : Week

SSS : Sequence



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

