

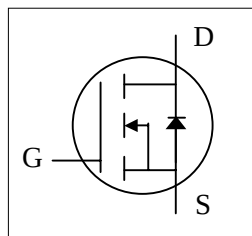


**Advanced Power
Electronics Corp.**

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

- ▼ Simple Drive Requirement
- ▼ Low On-resistance
- ▼ Fast Switching Characteristics

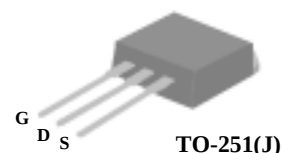
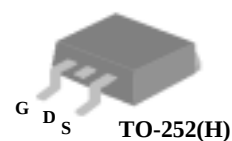


BV_{DSS}	900V
$R_{DS(ON)}$	$7.2\ \Omega$
I_D	1.9A

Description

The 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 universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The through-hole version (AP02N90J) is available for low-profile applications.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	900	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	1.9	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	1.2	A
I_{DM}	Pulsed Drain Current ¹	6	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	62.5	W
	Linear Derating Factor	0.5	W/ $^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy ²	36	mJ
I_{AR}	Avalanche Current	1.9	A
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	Units
R_{thj-c}	Thermal Resistance Junction-case	Max. 2.0	$^\circ\text{C}/\text{W}$
R_{thj-a}	Thermal Resistance Junction-ambient	Max. 110	$^\circ\text{C}/\text{W}$



AP02N90H/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 =1mA	900	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.8	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =0.85A	-	-	7.2	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =1.9A	-	2	-	S
I _{DSS}	Drain-Source Leakage Current (T _j =25°C)	V _{DS} =900V, V _{GS} =0V	-	-	10	uA
	Drain-Source Leakage Current (T _j =125°C)	V _{DS} =720V, V _{GS} =0V	-	-	100	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±30V	-	-	±100	nA
Q _g	Total Gate Charge ³	I _D =1.9A	-	12	20	nC
Q _{gs}	Gate-Source Charge	V _{DS} =540V	-	2.5	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	4.7	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DD} =450V	-	10	-	ns
t _r	Rise Time	I _D =1.9A	-	5	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =10Ω, V _{GS} =10V	-	18	-	ns
t _f	Fall Time	R _D =236Ω	-	9	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	630	1000	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	40	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	4	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ³	I _S =1.9A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _S =1.9A, V _{GS} =0V,	-	360	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	1.8	-	μC

Notes:

1. Pulse width limited by safe operating area.
2. Starting T_j=25°C, V_{DD}=50V, L=20mH, R_G=25Ω, I_{AS}=1.9A.
3. Pulse width ≤300us, duty cycle ≤2%.

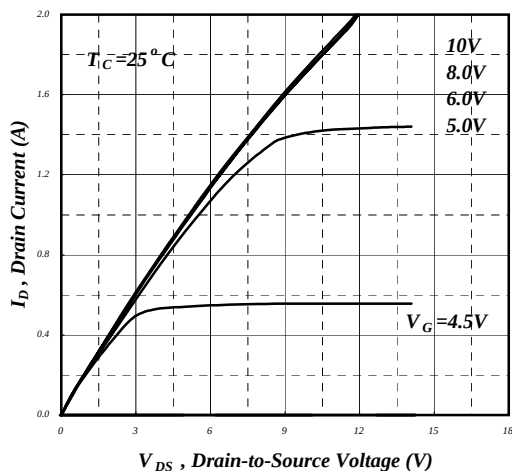


Fig 1. Typical Output Characteristics

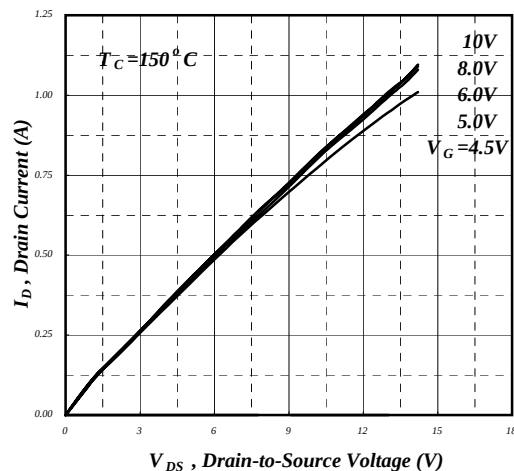


Fig 2. Typical Output Characteristics

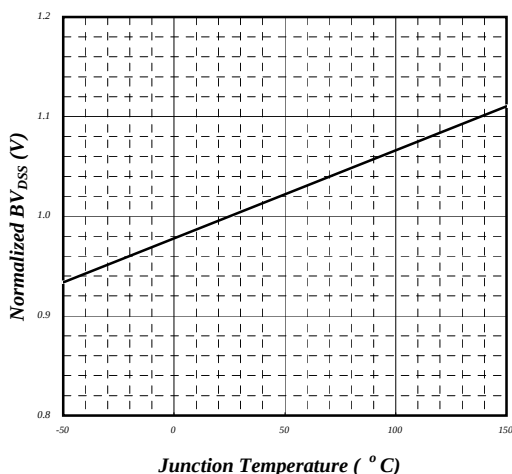


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

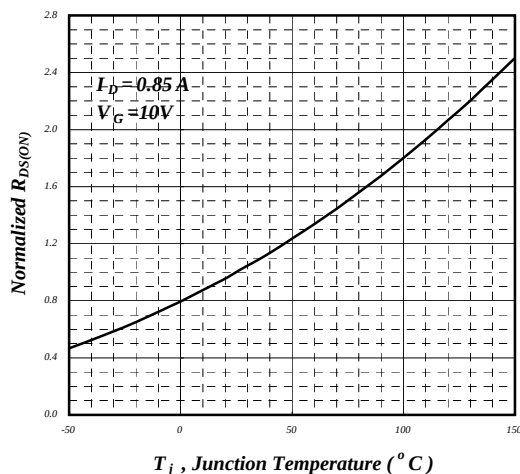


Fig 4. Normalized On-Resistance v.s. Junction Temperature

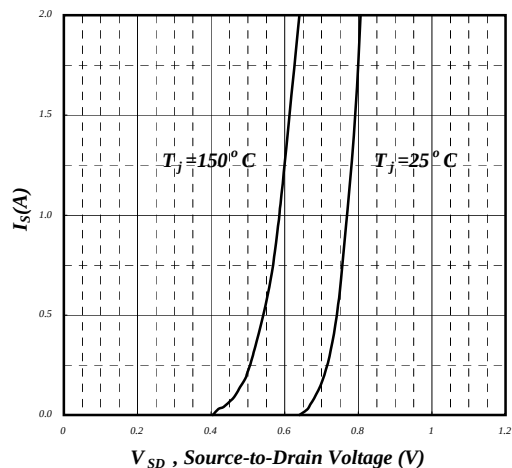


Fig 5. Forward Characteristic of Reverse Diode

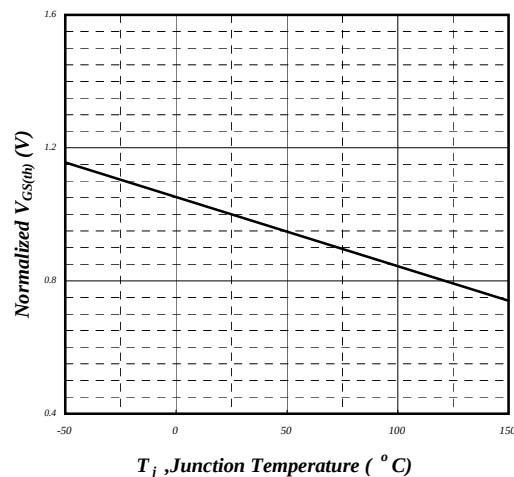


Fig 6. Gate Threshold Voltage v.s. Junction Temperature



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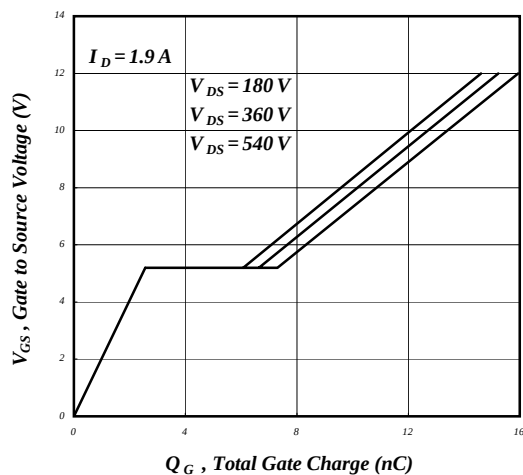


Fig 7. Gate Charge Characteristics

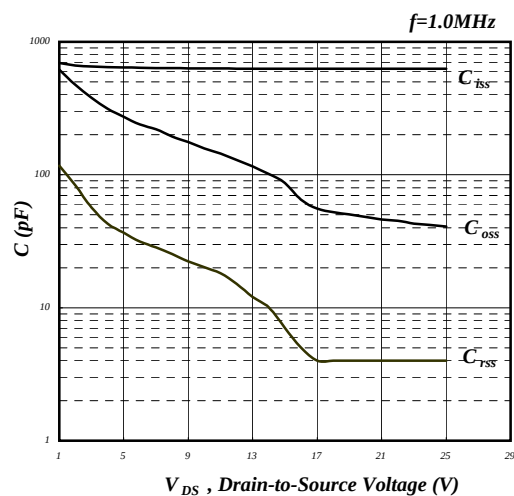


Fig 8. Typical Capacitance Characteristics

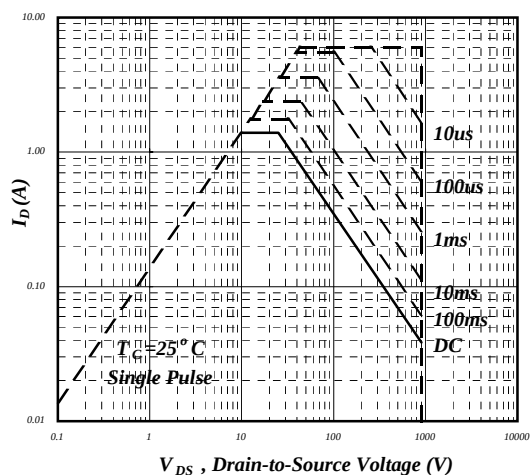


Fig 9. Maximum Safe Operating Area

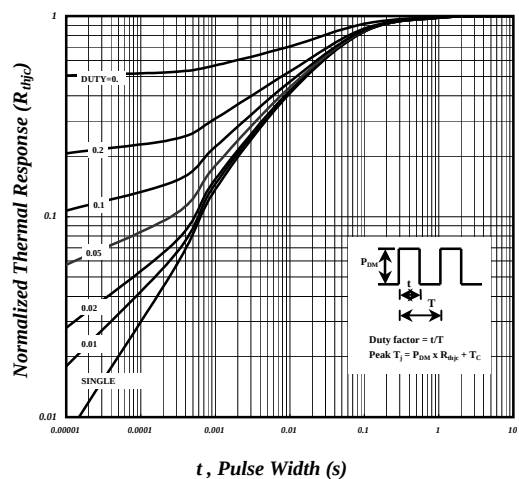


Fig 10. Effective Transient Thermal Impedance

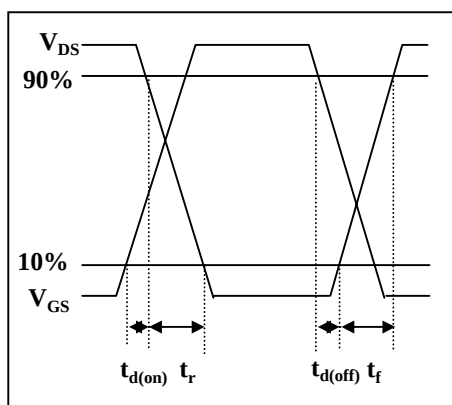


Fig 11. Switching Time Waveform

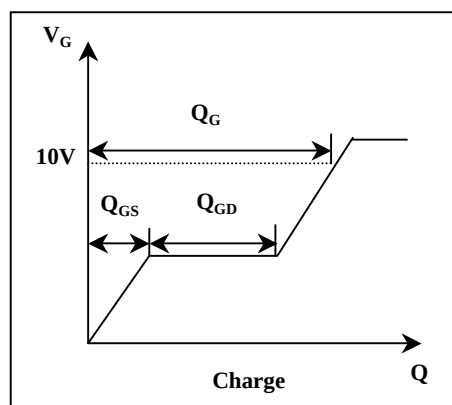


Fig 12. Gate Charge Waveform