



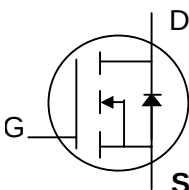
N-channel Enhancement-mode Power MOSFET

Simple Drive Requirement

Low On-Resistance

Fast Switching Performance

RoHS-compliant, halogen-free

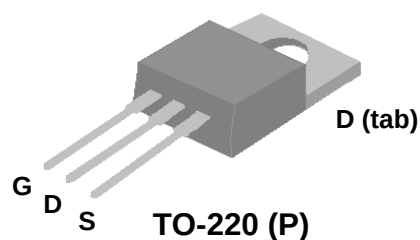


BV_{DS}	75V
$R_{DS(ON)}$	8m Ω
I_D	80A

Description

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

The AP94T07GP-HF-3 is in the TO-220 through-hole package which is used in commercial applications where a low PCB footprint or an attached heatsink is required. This device is well suited for low voltage applications such as DC/DC converters and high current DC switches.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	75	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D at $T_C=25^\circ\text{C}$	Continuous Drain Current	80	A
I_D at $T_C=100^\circ\text{C}$	Continuous Drain Current	58	A
I_{DM}	Pulsed Drain Current ¹	300	A
P_D at $T_C=25^\circ\text{C}$	Total Power Dissipation	125	W
E_{AS}	Single Pulse Avalanche Energy	45	mJ
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	1.2	$^\circ\text{C/W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62	$^\circ\text{C/W}$

Ordering Information

AP94T07GP-HF-3TB : in RoHS-compliant halogen-free TO-220, shipped in tubes (50pcs/tube)



Electrical Specifications at $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	75	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=40A$	-	-	8	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	5	V
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=40A$	-	55	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V, V_{GS}=0V$	-	-	25	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_D=40A$	-	58	92	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=60V$	-	14	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=10V$	-	29	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=40V$	-	13	-	ns
t_r	Rise Time	$I_D=40A$	-	80	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=1\Omega, V_{GS}=10V$	-	26	-	ns
t_f	Fall Time	$R_D=1\Omega$	-	12	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	2350	3760	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	390	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	245	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	1.3	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=40A, V_{GS}=0V$	-	-	1.3	V
t_{rr}	Reverse Recovery Time ²	$I_S=10A, V_{GS}=0V,$	-	46	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	83	-	nC

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test
3. Package limitation is 80A.
4. Starting $T_j=25^\circ\text{C}$, $V_{DD}=30V$, $L=0.1\text{mH}$, $R_G=25\Omega$, $I_{AS}=30A$.

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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Typical Electrical Characteristics

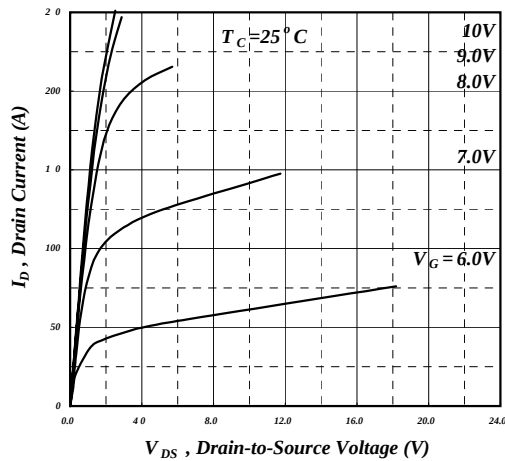


Fig 1. Typical Output Characteristics

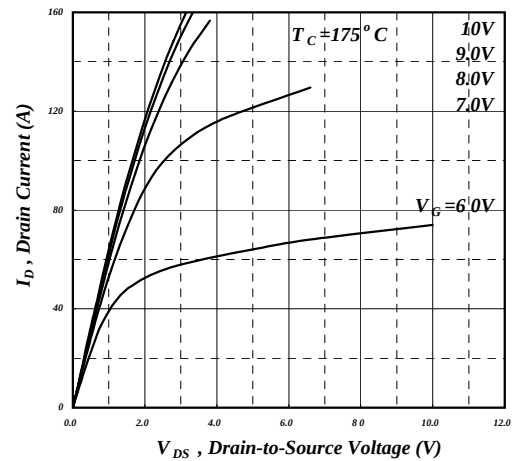


Fig 2. Typical Output Characteristics

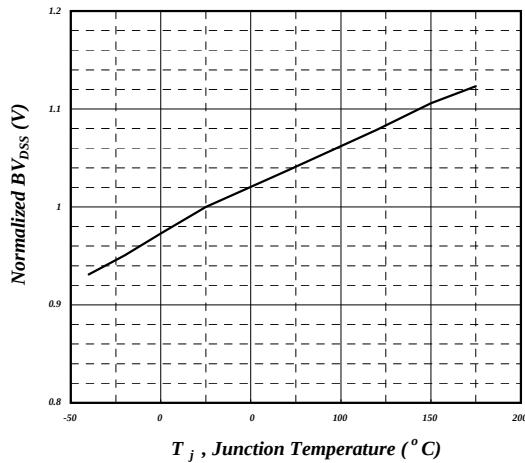


Fig 3. Normalised BV_{DSS}
vs. Junction Temperature

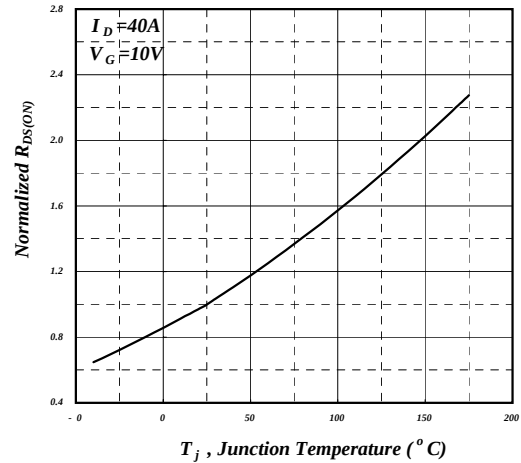


Fig 4. Normalized On-Resistance
vs. Junction Temperature

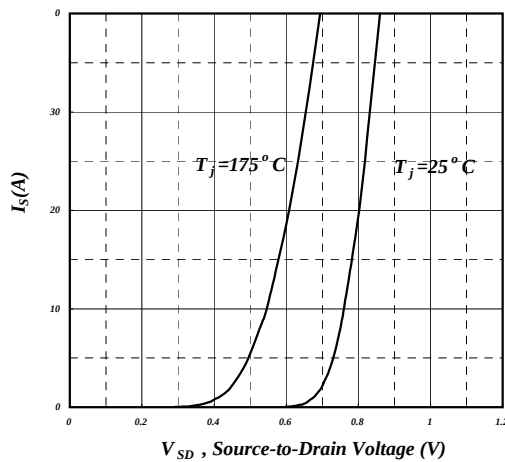


Fig 5. Forward Characteristic of
Reverse Diode

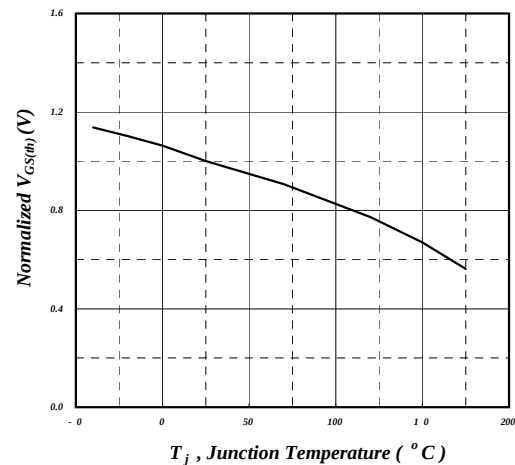


Fig 6. Gate Threshold Voltage vs.
Junction Temperature



Typical Electrical Characteristics (cont.)

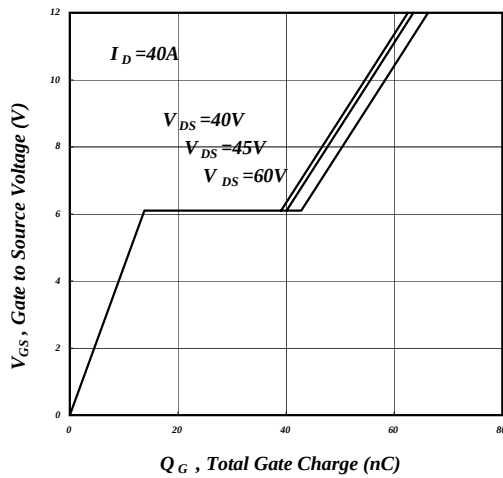


Fig 7. Gate Charge Characteristics

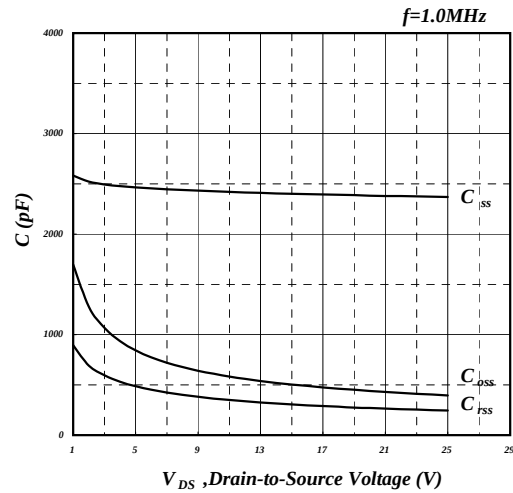


Fig 8. Typical Capacitance Characteristics

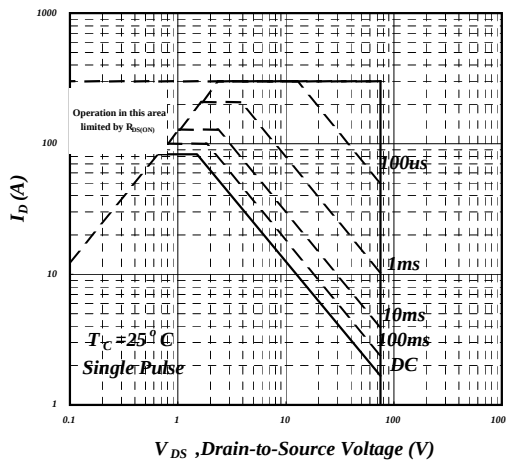


Fig 9. Maximum Safe Operating Area

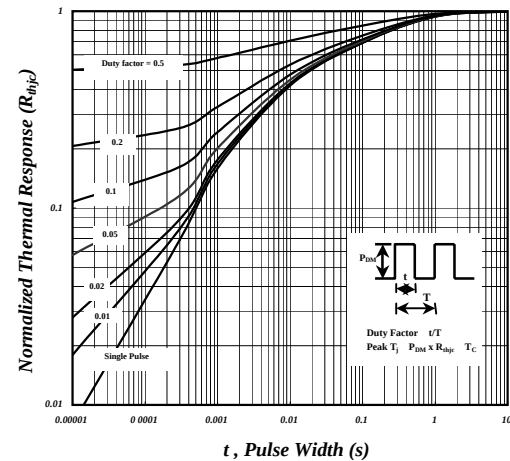


Fig 10. Effective Transient Thermal Impedance

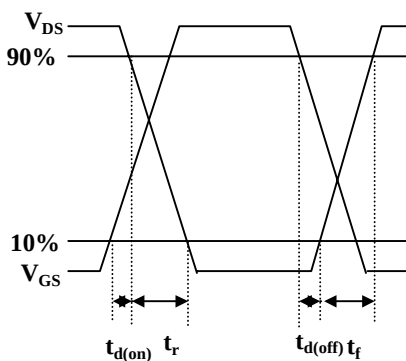


Fig 11. Switching Time Waveform

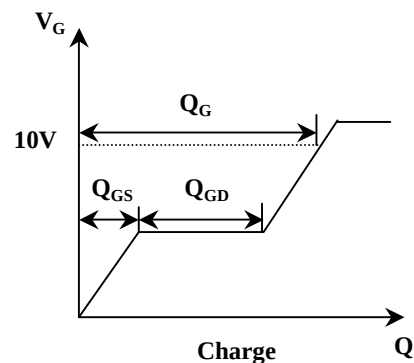
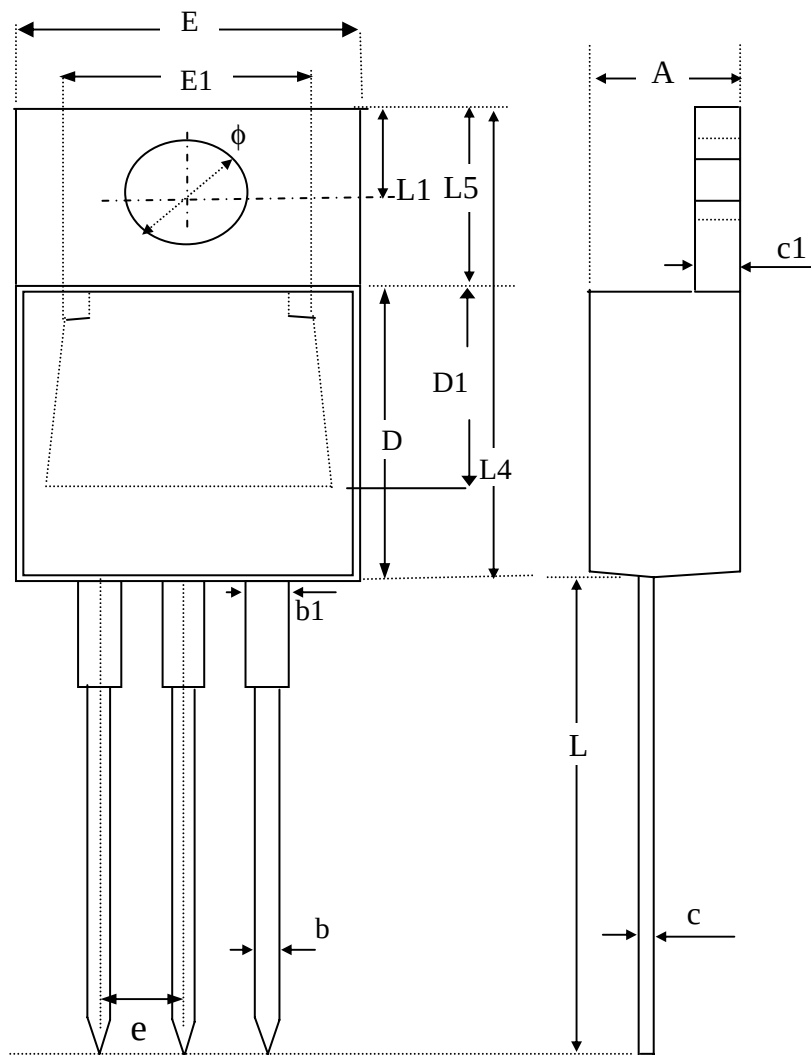


Fig 12. Gate Charge Waveform



Package Dimensions: TO-220



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.40	4.60	4.80
b	0.76	0.88	1.00
D	8.60	8.80	9.00
c	0.36	0.43	0.50
E	9.80	10.10	10.40
L4	14.70	15.00	15.30
L5	6.20	6.40	6.60
D1	5.10 REF.		
c1	1.25	1.35	1.45
b1	1.17	1.32	1.47
L	13.25	13.75	14.25
e	2.54 REF.		
L1	2.60	2.75	2.89
phi	3.71	3.84	3.96
E1	7.4 REF.		

1. All dimensions are in millimeters.
2. Dimensions do not include mold protrusions.

Marking Information:

