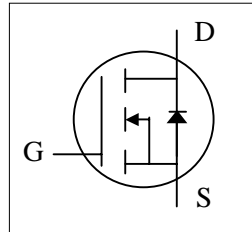




- ▼ Simple Drive Requirement
- ▼ Lower On-resistance
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free

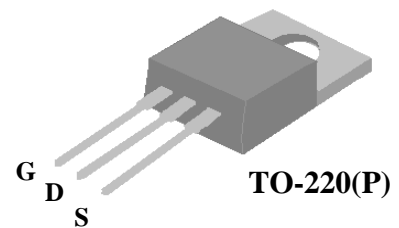


$BV_{DSS}$	75V
$R_{DS(ON)}$	8m $\Omega$
$I_D$	80A

### 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-220 package is widely preferred for commercial-industrial power applications and suited for low voltage applications such as DC/DC converters.



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	75	V
$V_{GS}$	Gate-Source Voltage	+20	V
$I_D@T_c=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^3$	80	A
$I_D@T_c=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V$	58	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	300	A
$P_D@T_c=25^\circ\text{C}$	Total Power Dissipation	125	W
$E_{AS}$	Single Pulse Avalanche Energy <sup>4</sup>	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
$R_{thj-c}$	Maximum Thermal Resistance, Junction-case	1.2	$^\circ\text{C}/\text{W}$
$R_{thj-a}$	Maximum Thermal Resistance, Junction-ambient	62	$^\circ\text{C}/\text{W}$



# AP94T07GP-HF

## Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	75	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A	-	-	8	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2	-	5	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>D</sub> =40A	-	55	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V	-	-	25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =40A	-	58	92	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =60V	-	14	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =10V	-	29	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =40V	-	13	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =40A	-	80	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =1Ω, V <sub>GS</sub> =10V	-	26	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =1Ω	-	12	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	2350	3760	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =25V	-	390	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	245	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	1.3	-	Ω

## Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =40A, V <sub>GS</sub> =0V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time <sup>2</sup>	I <sub>S</sub> =10A, V <sub>GS</sub> =0V,	-	46	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs	-	83	-	nC

### Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Package limitation current is 80A.
- 4.Starting T<sub>j</sub>=25°C, V<sub>DD</sub>=30V, L=0.1mH, R<sub>G</sub>=25Ω, I<sub>AS</sub>=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.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

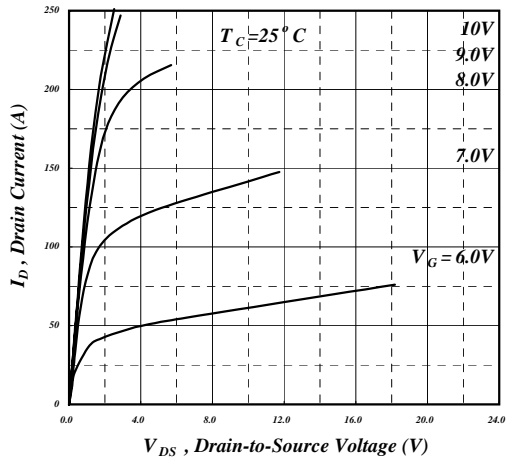


Fig 1. Typical Output Characteristics

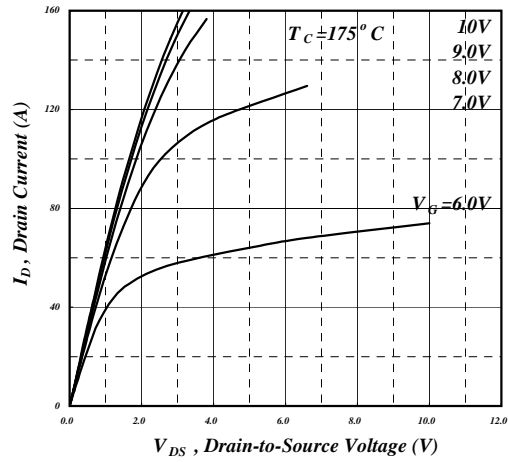


Fig 2. Typical Output Characteristics

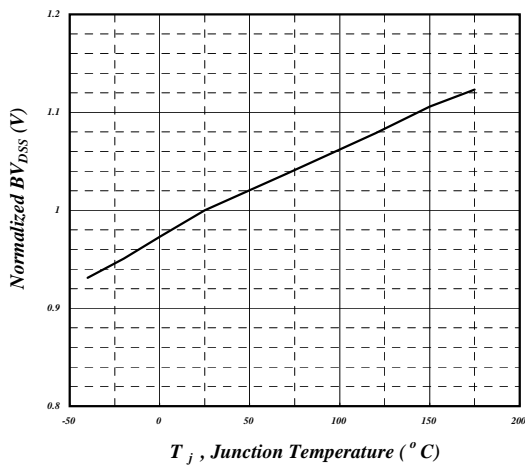


Fig 3. Normalized  $BV_{DSS}$  v.s. Junction Temperature

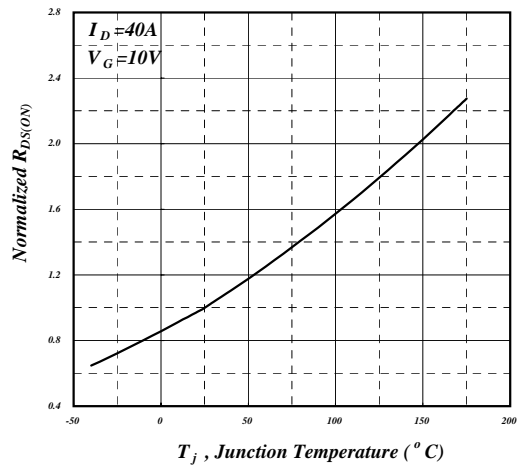


Fig 4. Normalized On-Resistance v.s. Junction Temperature

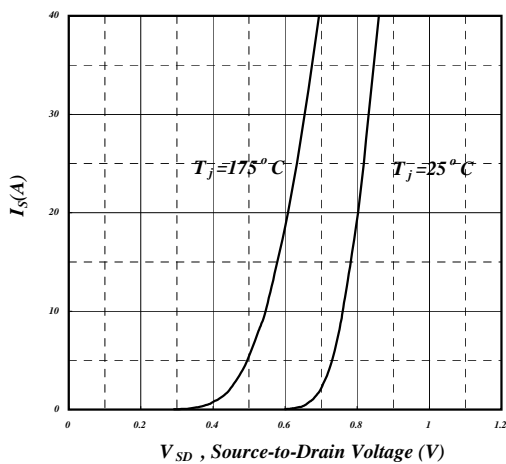


Fig 5. Forward Characteristic of Reverse Diode

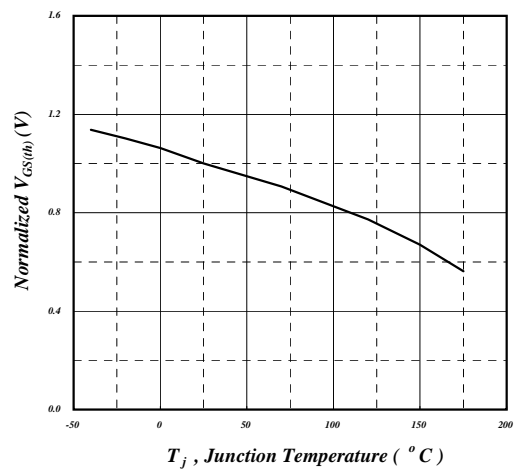
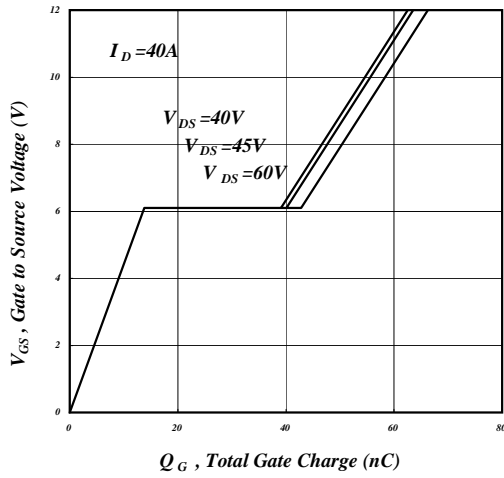
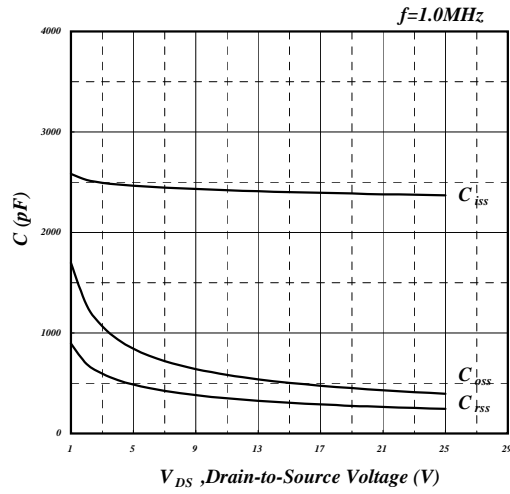


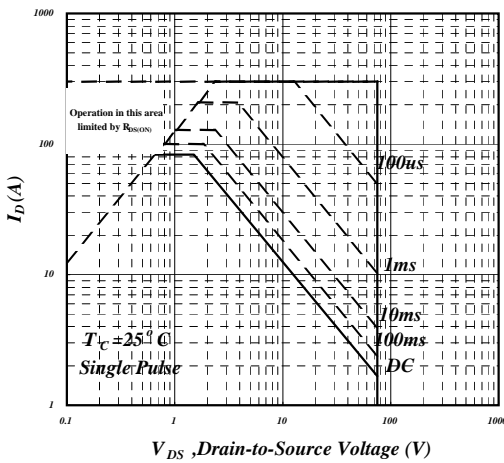
Fig 6. Gate Threshold Voltage v.s. Junction Temperature



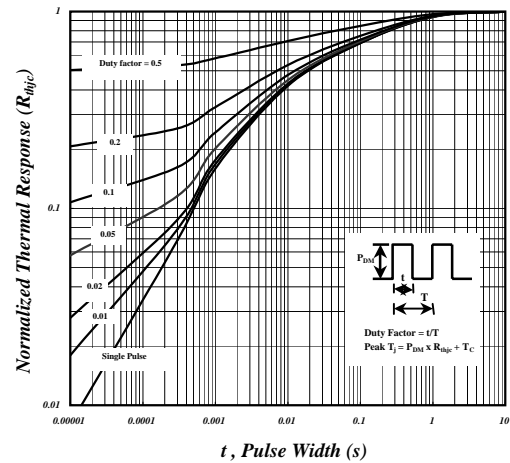
**Fig 7. Gate Charge Characteristics**



**Fig 8. Typical Capacitance Characteristics**



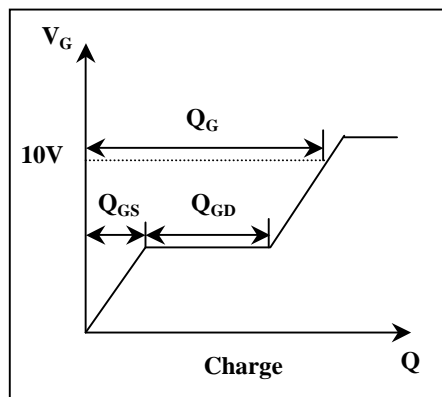
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**