



N-channel Enhancement-mode Power MOSFET

- Simple Drive Requirement**
- Low On-resistance**
- Fast Switching Performance**
- RoHS-compliant, halogen-free**

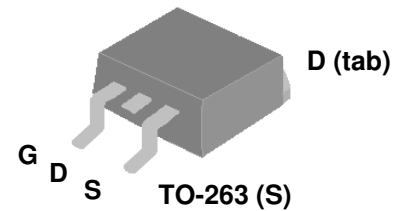


BV_{DSS}	75V
$R_{DS(ON)}$	4.5mΩ
I_D	120A

Description

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

The AP97T07AGS-HF-3 is in the TO-263 package, which is widely used for commercial and industrial surface-mount applications, and is well 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 at $T_C=25^\circ C$	Continuous Drain Current (Chip)	175	A
I_D at $T_C=25^\circ C$	Continuous Drain Current	120	A
I_D at $T_C=100^\circ C$	Continuous Drain Current	120	A
I_{DM}	Pulsed Drain Current ¹	480	A
P_D at $T_C=25^\circ C$	Total Power Dissipation	300	W
P_D at $T_A=25$	Total Power Dissipation	3.75	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	0.5	°C/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) ⁴	40	°C/W

Ordering Information

AP96T07GS-HF-3TR : in RoHS-compliant halogen-free TO-263, shipped on tape and reel (800 pcs/reel)



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	$V_{GS}=10V, I_D=40A$	-	-	4.5	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=40A$	-	90	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=75V, V_{GS}=0V$	-	-	25	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Q_g	Total Gate Charge	$I_D=40A$	-	92	150	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=60V$	-	16	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=10V$	-	48	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=40V$	-	18	-	ns
t_r	Rise Time	$I_D=40A$	-	90	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{GS}=10V$	-	40	-	ns
t_f	Fall Time	$R_D=1\Omega$	-	80	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	3500	5600	pF
C_{oss}	Output Capacitance	$V_{DS}=25V$	-	1000	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	270	-	pF
R_g	Gate Resistance	$f=1.0\text{MHz}$	-	1.4	2.1	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	$I_S=10A, V_{GS}=0V$	-	70	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=100A/\mu s$	-	180	-	nC

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test
3. Package limitation current is 120A.
4. Surface mounted on 1 in² copper pad of FR4 board

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

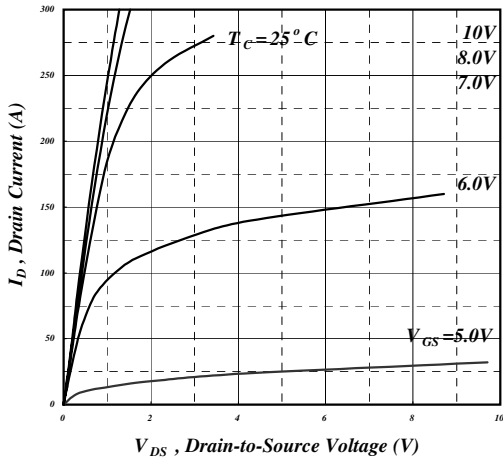


Fig 1. Typical Output Characteristics

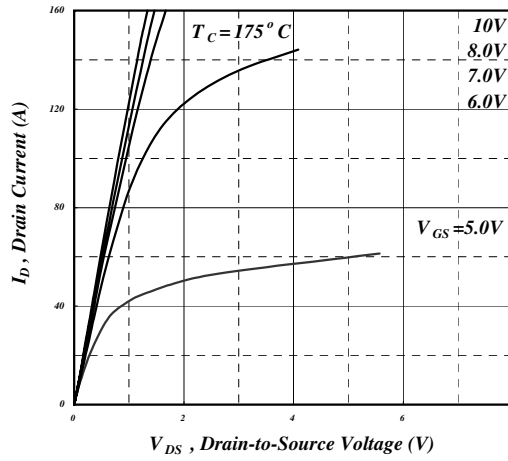


Fig 2. Typical Output Characteristics

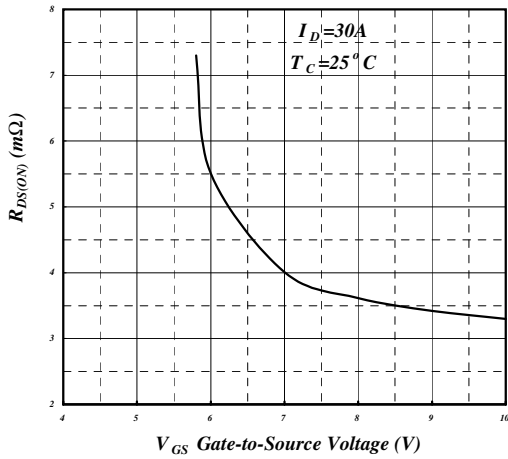


Fig 3. On-Resistance v.s. Gate Voltage

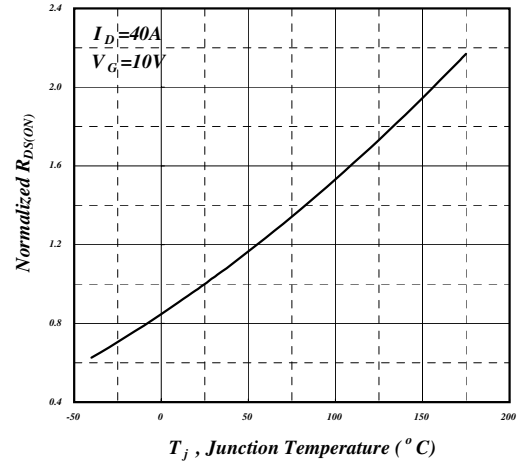


Fig 4. Normalized On-Resistance vs. Junction Temperature

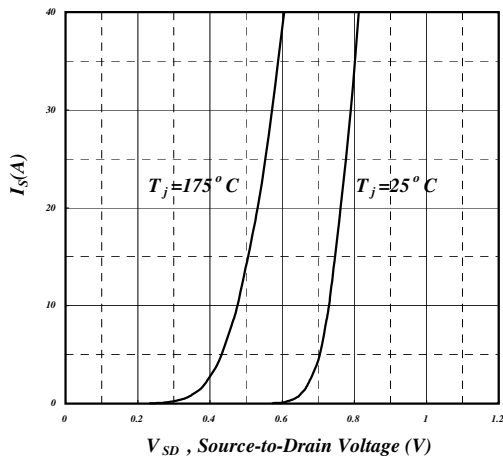


Fig 5. Forward Characteristic of Reverse Diode

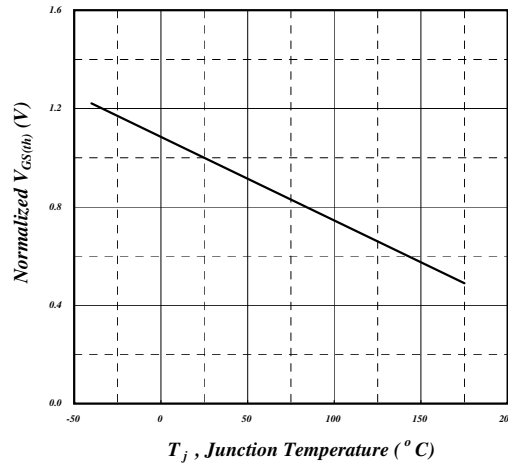


Fig 6. Gate Threshold Voltage vs. Junction Temperature



Typical Electrical Characteristics (cont.)

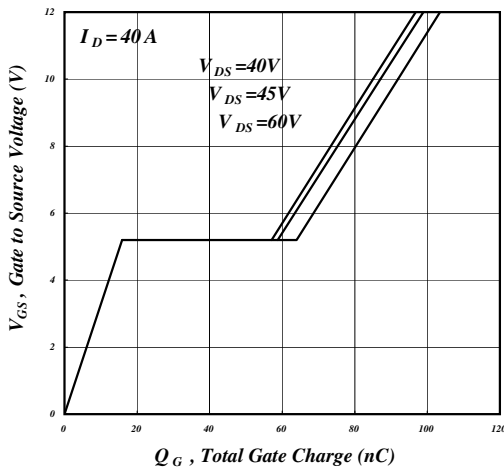


Fig 7. Gate Charge Characteristics

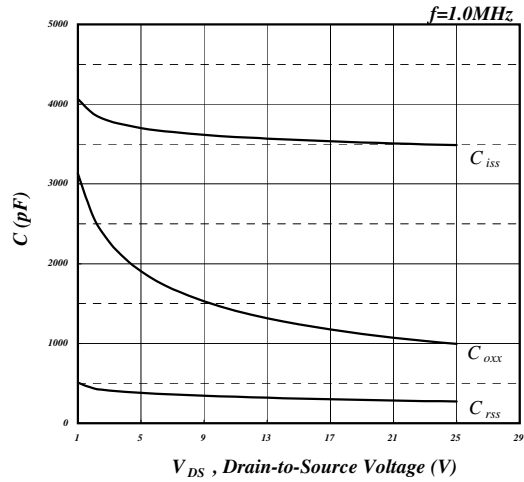


Fig 8. Typical Capacitance Characteristics

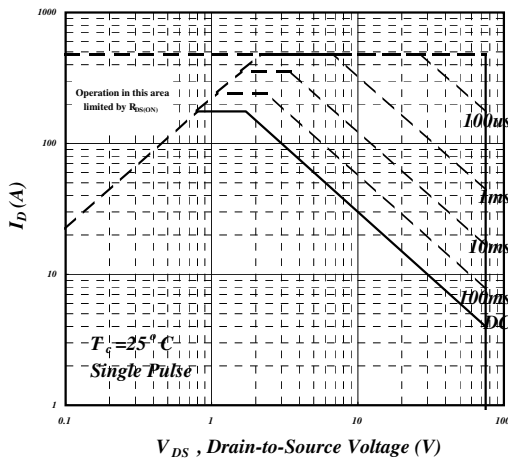


Fig 9. Maximum Safe Operating Area

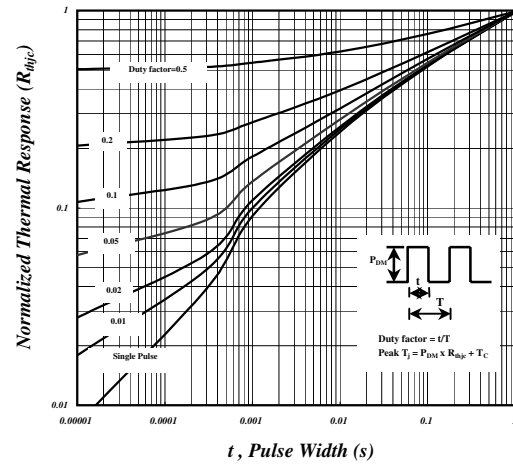


Fig 10. Effective Transient Thermal Impedance

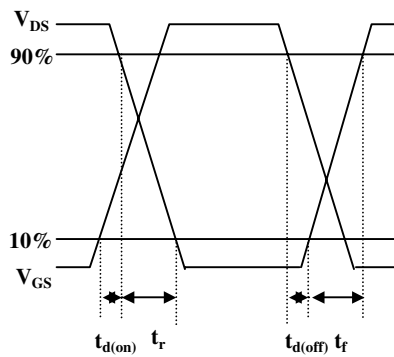


Fig 11. Switching Time Waveforms

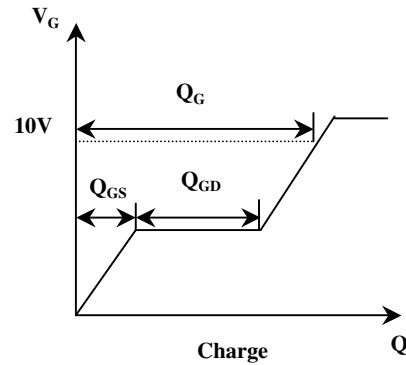
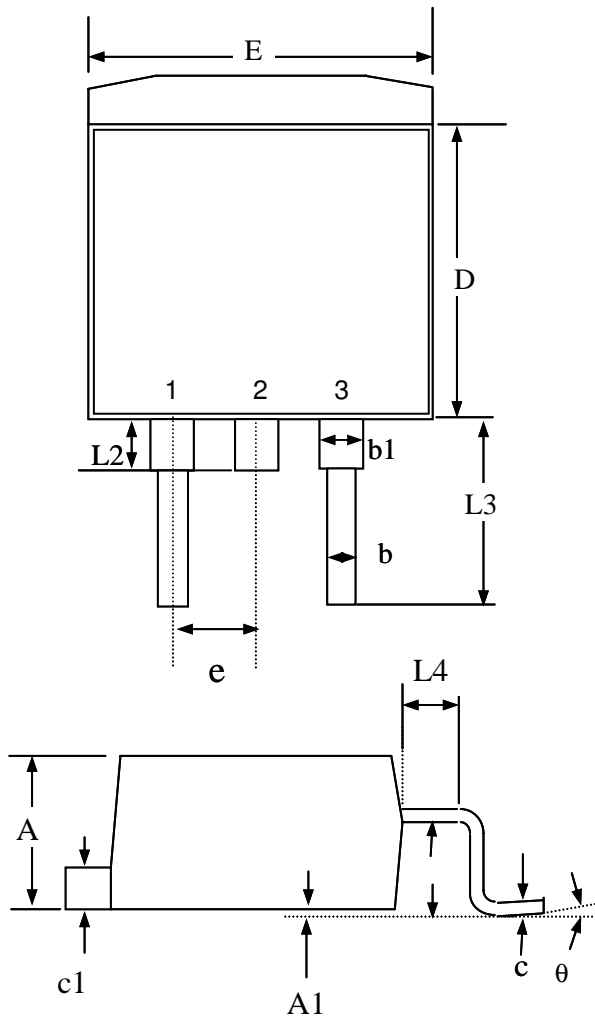


Fig 12. Gate Charge Waveform



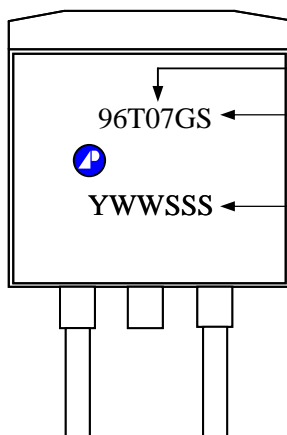
Package Dimensions: TO-263



SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	4.25	4.75	5.20
A1	0.00	0.15	0.30
A2	2.20	2.45	2.70
b	0.70	0.90	1.10
b1	1.07	1.27	1.47
c	0.30	0.45	0.60
c1	1.15	1.30	1.45
D	8.30	8.90	9.40
E	9.70	10.10	10.50
e	2.04	2.54	3.04
L2	-----	1.50	-----
L3	4.50	4.90	5.30
L4	-----	1.50	----

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

Marking Information: TO-263



Product: AP96T07
 Package code:
 GS = RoHS-compliant halogen-free TO-263
 Date Code (YWWSSS)
 Y : Last digit of the year
 WW : Work week
 SSS : Lot code sequence