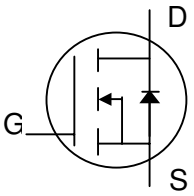
N-channel Enhancement-mode Power MOSFET

Simple Drive Requirement

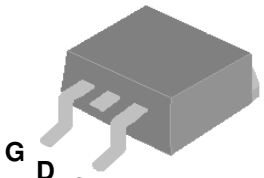
Low On-resistance

Fast Switching Performance

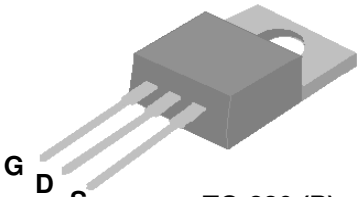
RoHS-compliant, halogen-free



BV_{DSS}	75V
$R_{DS(ON)}$	5mΩ
I_D	80A



TO-263 (S)



TO-220 (P)

Description

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

The AP95T07GS-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.

The AP95T07GP-HF-3 is in the TO-220 through-hole package which is used where a low PCB footprint or an attached heatsink is required.

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℃	Continuous Drain Current[3]	80	A
I_D at T_C=100℃	Continuous Drain Current[3]	70	A
I_{DM}	Pulsed Drain Current[1]	320	A
P_D at T_C=25℃	Total Power Dissipation	300	W
	Linear Derating Factor	2	W/℃
E_{AS}	Single Pulse Avalanche Energy [4]	450	mJ
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Maximum Thermal Resistance, Junction-case	0.5	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[5]	40	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	62	℃/W

Ordering Information

AP95T07GS-HF-3TR : in RoHS-compliant halogen-free TO-263, shipped on tape and reel (800 pcs/reel)

AP95T07GP-HF-3TB : in RoHS-compliant halogen-free TO-220, shipped in tubes (50pcs/tube)

Electrical Specifications at T_j=25℃ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=1mA	75	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=60A	-	-	5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2	-	4	V
g_{fs}	Forward Transconductance	V_{DS}=10V, I_D=60A	-	88	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=75V, V_{GS}=0V	-	-	10	uA
	Drain-Source Leakage Current (T_j=125°C)	V_{DS}=60V ,V_{GS}=0V	-	-	250	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= ±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=80A	-	85	135	nC
Q_{gs}	Gate-Source Charge	V_{DS}=40V	-	25	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=10V	-	36	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=40V	-	22	-	ns
t_r	Rise Time	I_D=80A	-	160	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω , V_{GS}=10V	-	38	-	ns
t_f	Fall Time	R_D=0.5Ω	-	165	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	4290	6870	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	985	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	390	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1.2	1.8	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=60A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time[2]	I_S=40A, V_{GS}=0V	-	75	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	190	-	nC

Notes:

1.Pulse width limited by maximum junction temperature.

2.Pulse test

3.Package limitation current is 80A, calculated continuous current based on maximum allowable junction temperature is 169A.

4.Starting Tj=25C , L=1mH , I_{AS}=30A.

5.Surface-mounted on 1 in^2 copper pad of FR4 board

Typical Electrical Characteristics

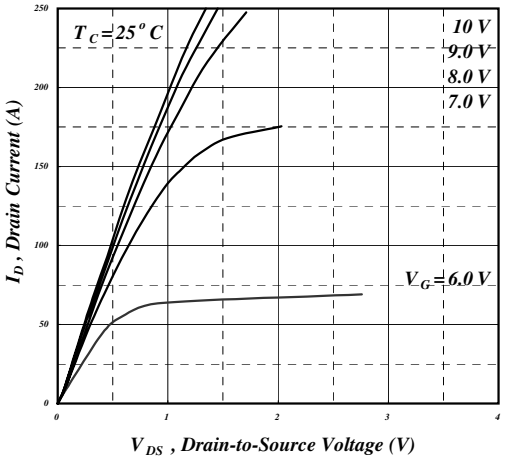


Fig 1. Typical Output Characteristics

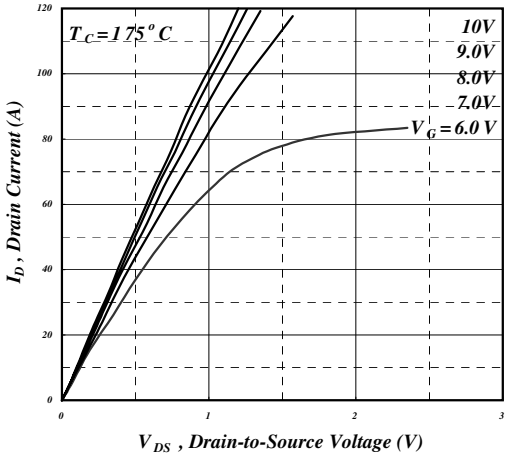


Fig 2. Typical Output Characteristics

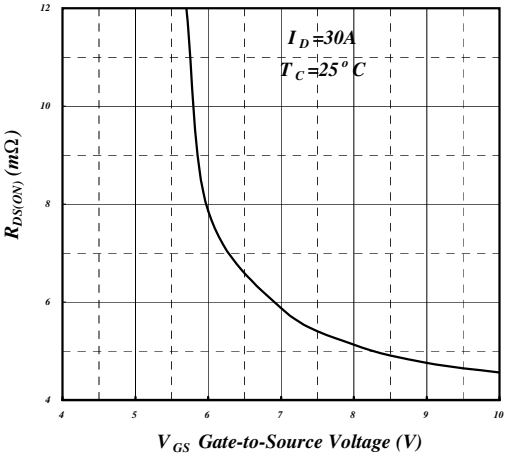


Fig 3. On-Resistance vs. Gate Voltage

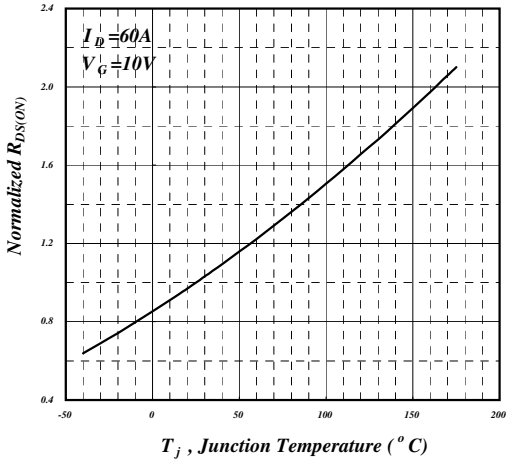


Fig 4. Normalized On-Resistance vs. Junction Temperature

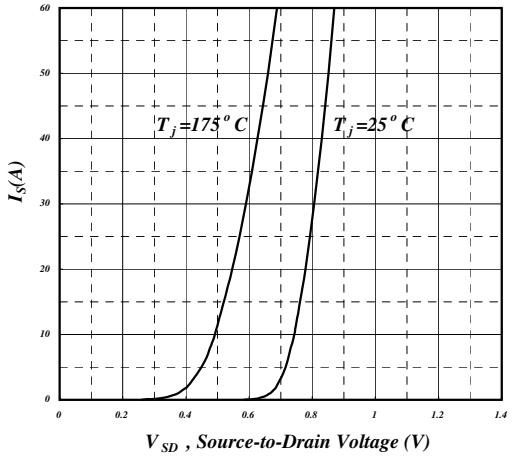


Fig 5. Forward Characteristic of Reverse Diode

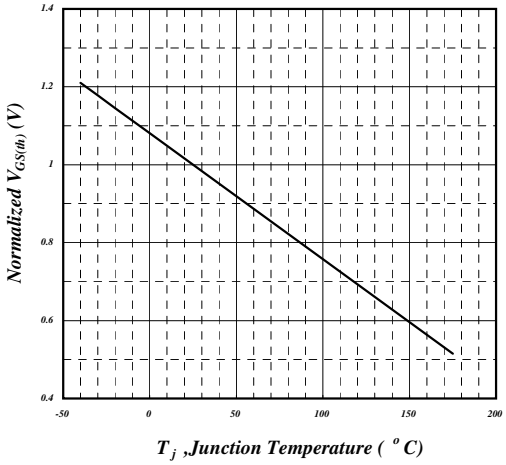


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

Typical Electrical Characteristics (cont.)

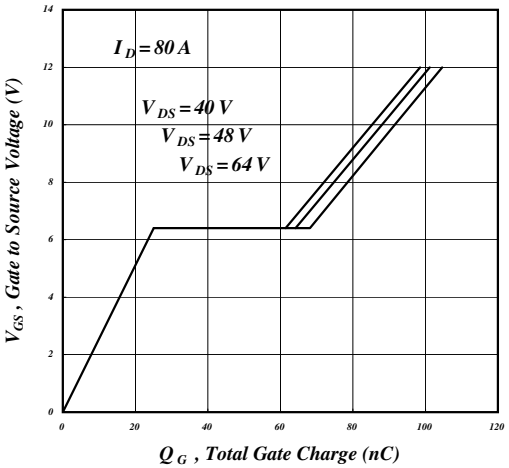


Fig 7. Gate Charge Characteristics

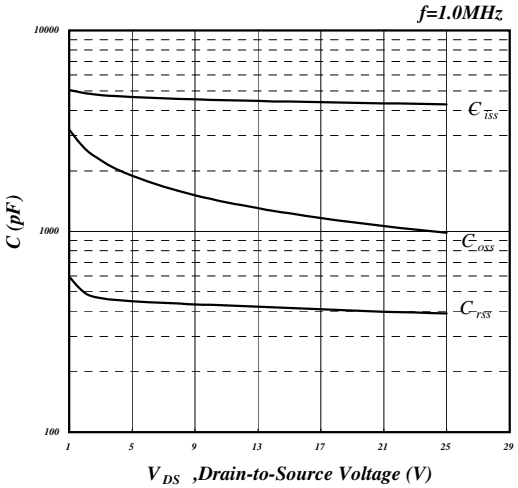


Fig 8. Typical Capacitance Characteristics

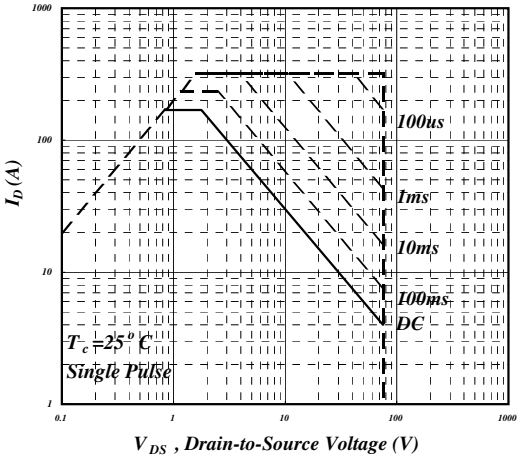


Fig 9. Maximum Safe Operating Area

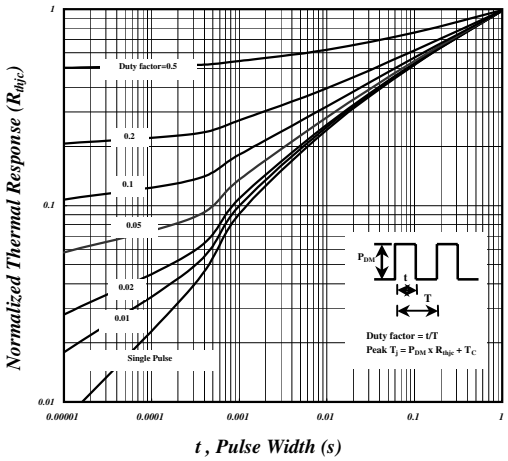


Fig 10. Effective Transient Thermal Impedance

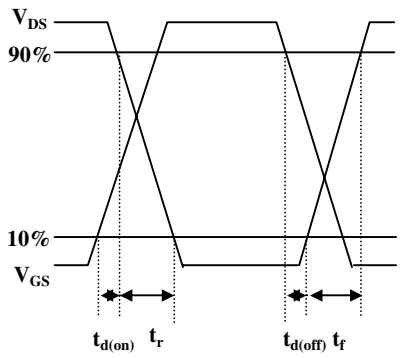


Fig 11. Switching Time Waveform

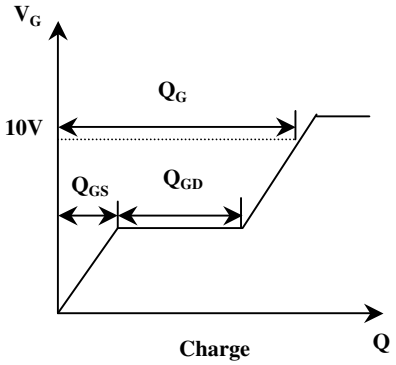
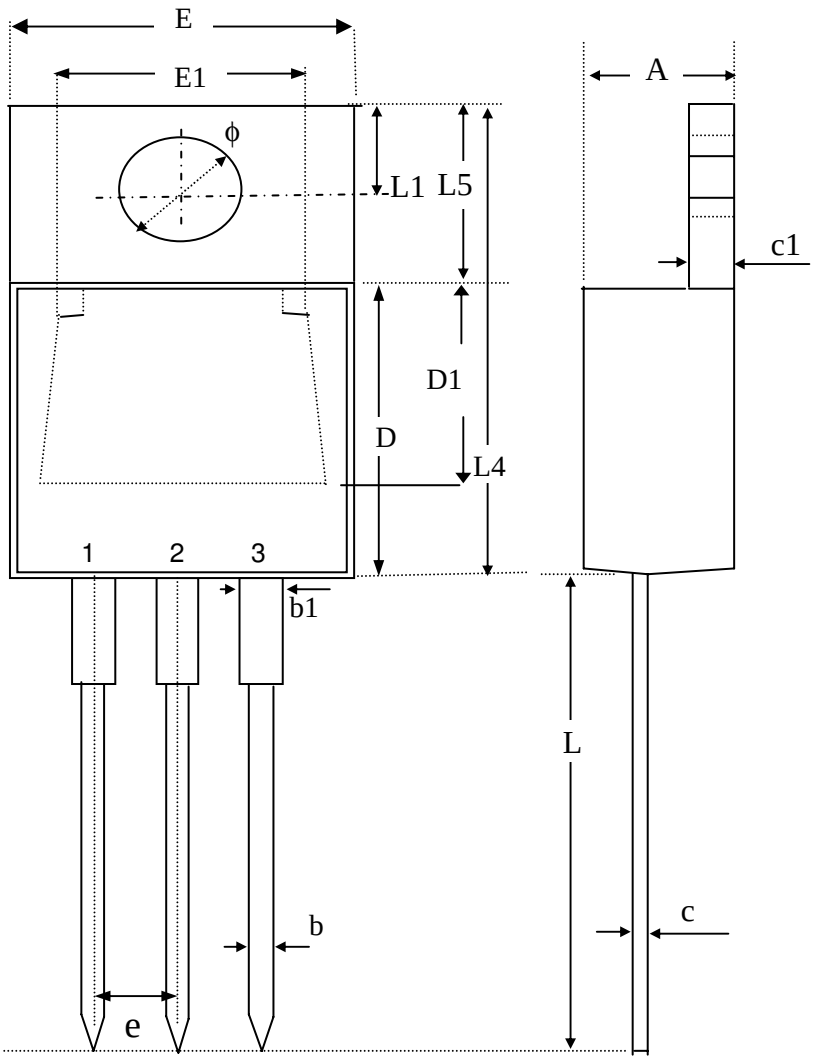


Fig 12. Gate Charge Waveform

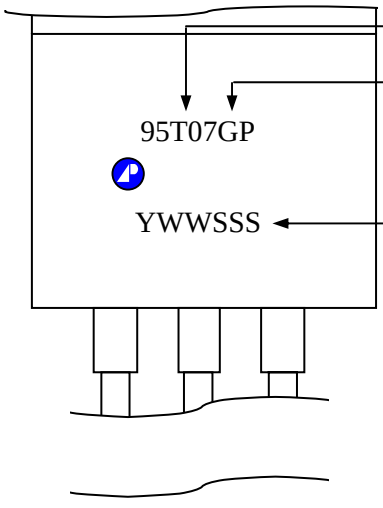
Package Dimensions: TO-220



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
ϕ	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: TO-220

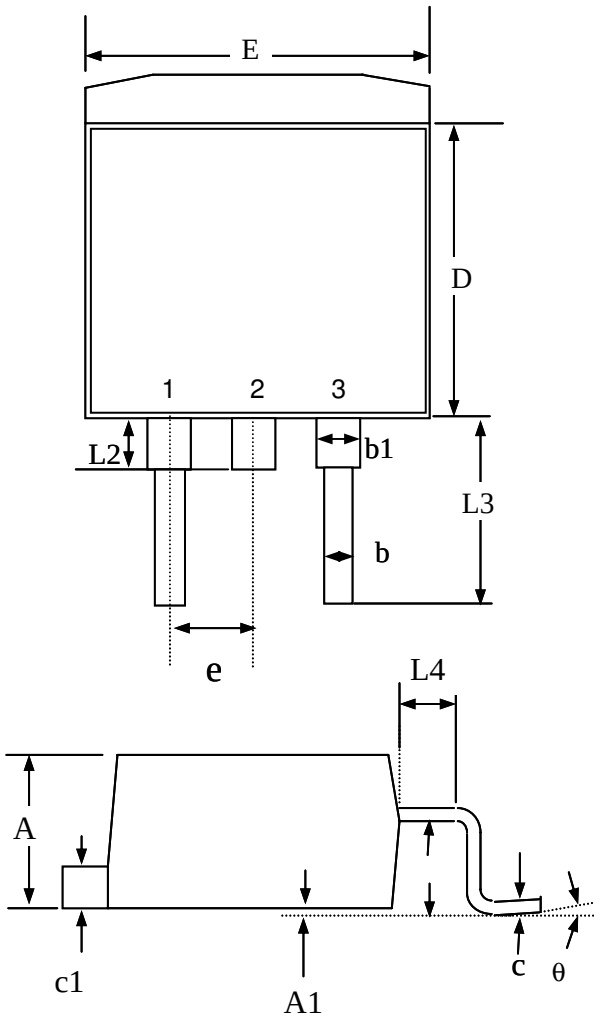


Product: AP95T07

Package code
GP = RoHS-compliant halogen-free TO-220

Date/lot code (YWWSSS)
Y: Last digit of the year
WW: Work week
SSS: Lot code sequence

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