



DESCRIPTION

The AM03N150 is available in TO-220, TO-220F, TO-3PN, TO-3PF, TO-247 and TO-263-2 Packages

BVDSS	RDSON	ID
1500V	5800 mΩ	3A

APPLICATIONS

- High Frequency Switching Mode Power Supply

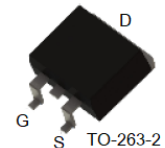
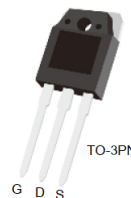
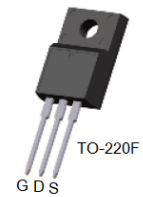
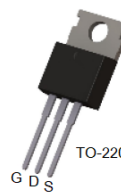
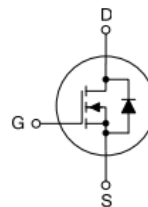
ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs/Tube	T3	AM03N150T3U
		AM03N150T3VU
TO-220F SPQ: 50pcs/Tube	T3F	AM03N150T3FU
		AM03N150T3FVU
TO-3PN SPQ: 30pcs/Tube	TX	AM03N150TXU
		AM03N150TXVU
TO-3PF SPQ: 30pcs/Tube	TXF	AM03N150TXFU
		AM03N150TXFVU
TO-247 SPQ: 30pcs/Tube	TL3F	AM03N150TL3FU
		AM03N150TL3FVU
TO-263-2 SPQ: 800pcs/ Reel	S2	AM03N150S2R
		AM03N150S2VR
Note	U: Tube R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

FEATURE

- Fast Switching
- Low C_{rss}
- 100% avalanche tested
- Improved dv/dt capability

PIN DESCRIPTION



Pin#	Symbol	Function
1	G	Gate
2	D	Drain
3	S	Source

**ABSOLUTE MAXIMUM RATINGS**T_A = 25°C, unless otherwise specified.

Parameter		Symbol	Value	Unit
Drain-to-Source Voltage		V _{DSS}	1500	V
Continuous Drain Current		I _D	3	A
	T _C = 100°C		1.7	A
Pulsed Drain Current ⁽¹⁾		I _{DM}	12	A
Gate-to-Source Voltage		V _{GS}	±30	V
Single Pulse Avalanche Energy ⁽²⁾		E _{AS}	450	mJ
Peak Diode Recovery dv/dt ⁽³⁾		dv/dt	5.0	V/ns
Power Dissipation	TO-220, TO-3PN, TO-247, TO-263-2	P _D	140	W
Derating Factor above 25°C			1.1	W/°C
Power Dissipation	TO-220F, TO-3PF		62.5	W
Derating Factor above 25°C			0.5	W/°C
Operating Junction		T _J	150	°C
Storage Temperature Range		T _{STG}	-55 ~ +150	°C
Maximum Temperature for Soldering		T _L	300	°C

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(1) Pulse width limited by maximum junction temperature

(2) I_{DS}=2.5A, V_{DD}=50V, Start T_A=25°C

(3) I_{SD}=3A, di/dt ≤100A/us, V_{DD}≤BV_{DS}, Start T_A=25°C

THERMAL CHARACTERISTICS

TO-220, TO-3PN, TO-247, TO-263-2			
Thermal Resistance Junction-Ambient	R _{θJA}	62.5	°C/W
Thermal Resistance Junction-Case	R _{θJC}	0.89	°C/W
TO-220F, TO-3PF			
Thermal Resistance Junction-Ambient	R _{θJA}	62.5	°C/W
Thermal Resistance Junction-Case	R _{θJC}	2	°C/W

**ELECTRICAL CHARACTERISTICS**T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	V _{DSS}	V _{GS} =0V, I _D =250μA	1500	-	-	V
BVDSS Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250μA Reference 25°C	-	1.2	-	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =1500V, V _{GS} =0V T _J =25°C	-	-	10	μA
		V _{DS} =1200V, V _{GS} =0V, T _J =125°C	-	-	500	
Gate-Source Forward Leakage	I _{GSS(F)}	V _{GS} =+30V	-	-	100	nA
Gate-Source Reverse Leakage	I _{GSS(R)}	V _{GS} =-30V	-	-	-100	
ON CHARACTERISTICS						
Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =1.5A *	-	5.8	8.0	Ω
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA *	3.0	-	5.0	V
DYNAMIC CHARACTERISTICS						
Gate Resistance	R _g	f=1.0MHz	-	3.0	-	Ω
Input Capacitance	C _{iss}	V _{GS} =0V,	-	1450	-	pF
Output Capacitance	C _{oss}	V _{DS} =25V,	-	87.5	-	
Reverse Transfer Capacitance	C _{rss}	f=1.0MHz	-	4.7	-	
SWITCHING CHARACTERISTICS						
Turn-on Delay Time	t _{d(ON)}	I _D =1.25A, V _{DD} =750V, V _{GS} =10V, R _G =5Ω	-	25	-	nS
Rise Time	t _r		-	46	-	
Turn-Off Delay Time	t _{d(OFF)}		-	45	-	
Fall Time	t _f		-	60	-	
Total Gate Charge	Q _g	I _D =3A, V _{DD} =1000V, V _{GS} =10V	-	36	-	nC
Gate to Source Charge	Q _{gs}		-	11	-	
Gate to Drain ("Miller") Charge	Q _{gd}		-	14	-	
SOURCE-DRAIN DIODE CHARACTERISTICS						
Continuous Source Current (Body Diode)	I _S	T _C =25°C	-	-	3	A
Maximum Pulsed Current (Body Diode)	I _{SM}		-	-	12	A
Diode Forward Voltage	V _{SD}	I _S =3A, V _{GS} =0V *	-	-	1.2	V
Reverse Recovery Time	T _{rr}	I _S =2.5A, T _A =25°C, dIF/dt=100A/μs, V _{GS} =0V	-	405	-	nS
Reverse Recovery Charge	Q _{rr}		-	2400	-	nC
Reverse Recovery Current	I _{rrm}		-	11.8	-	A

* Pulse width t_p≤300μs, δ≤2%



TYPICAL PERFORMANCE CHARACTERISTICS

Fig.1 Safe Operating Area
(TO-220, TO-3PN, TO-247, TO-263-2)

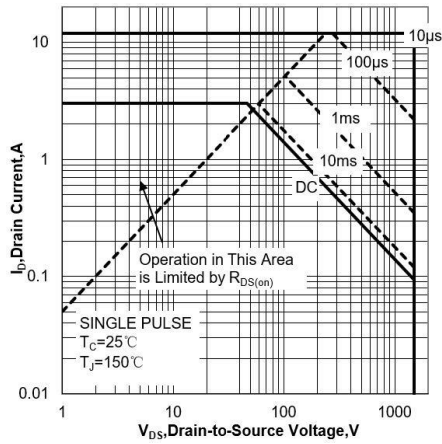


Fig.2 Safe Operating Area (TO-220F, TO-3PF)

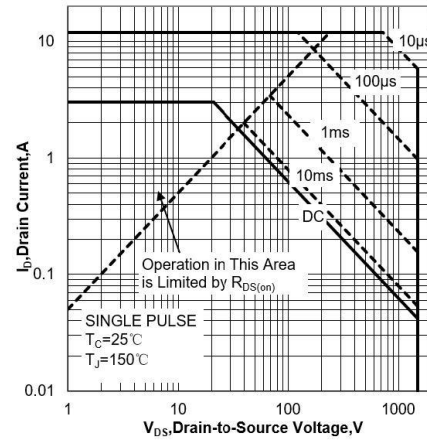


Fig.3 Power Dissipation
(TO-220, TO-3PN, TO-247, TO-263-2)

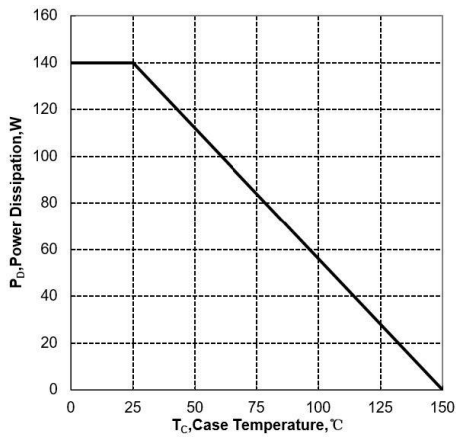


Fig.4 Power Dissipation (TO-220F, TO-3PF)

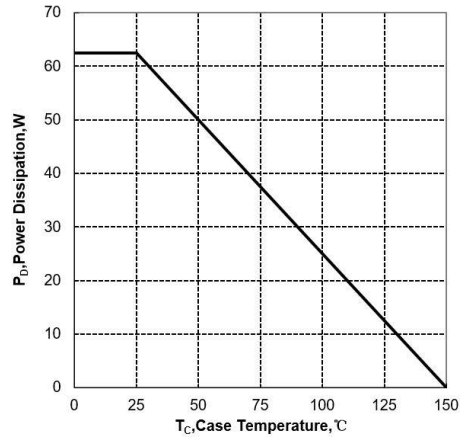


Fig.5 Max Thermal Impedence
(TO-220, TO-3PN, TO-247, TO-263-2)

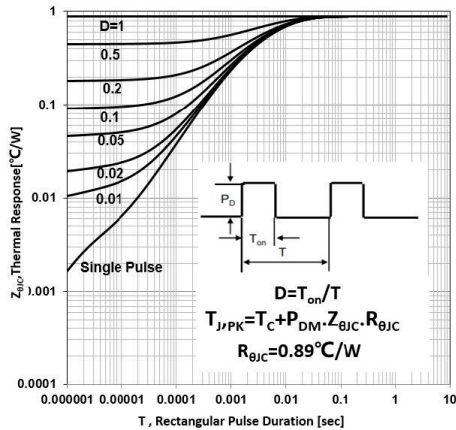


Fig.6 Max Thermal Impedence
(TO-220F, TO-3PF)

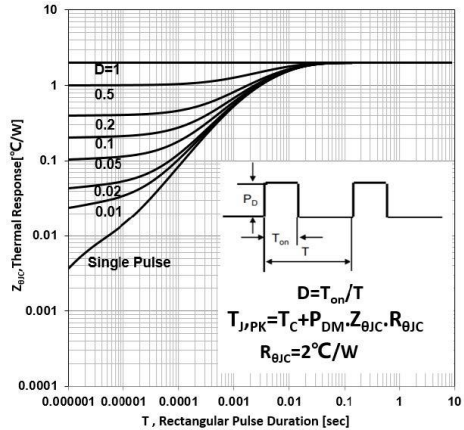




Fig.7 Typical Output Characteristics

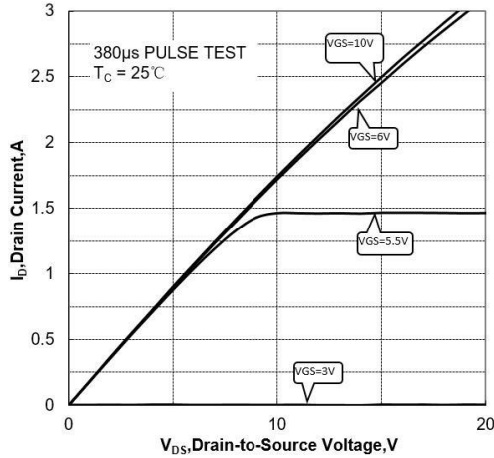


Fig.8 Typical Transfer Characteristics

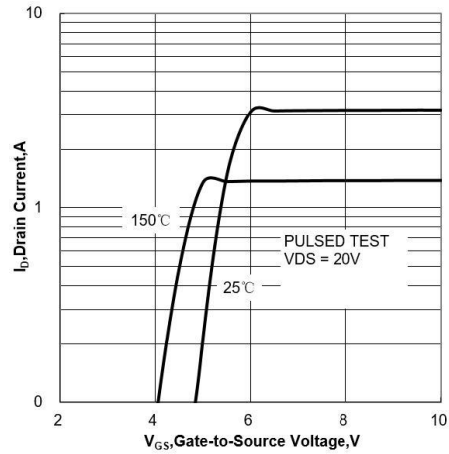


Fig.9 Typical Drain to Source ON Resistance vs. Drain Current

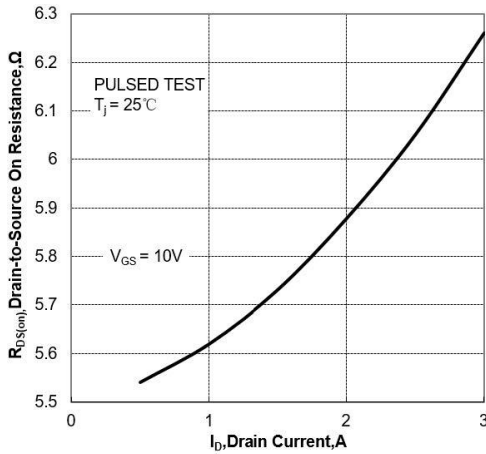


Fig.10 Typical Drain to Source on Resistance vs. Junction Temperature

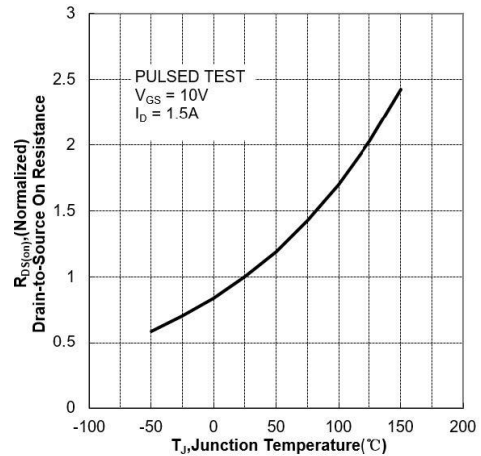


Fig.11 Typical Threshold Voltage vs. Junction Temperature

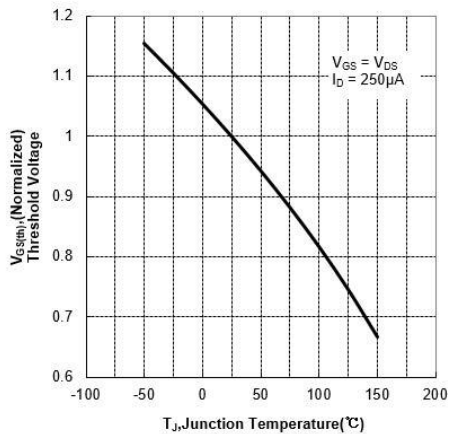


Fig.12 Typical Breakdown Voltage vs. Junction Temperature

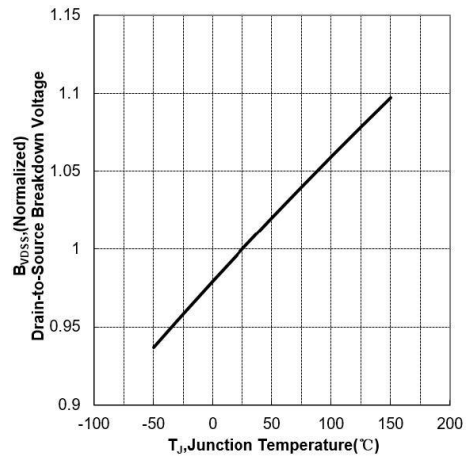




Fig.13 Typical Capacitance vs. Drain to Source Voltage

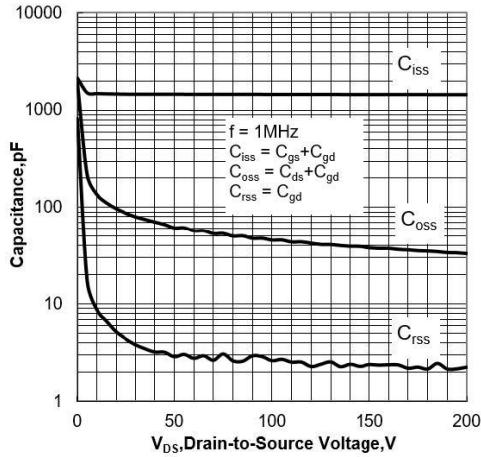


Fig.15 Gate Charge Test Circuit

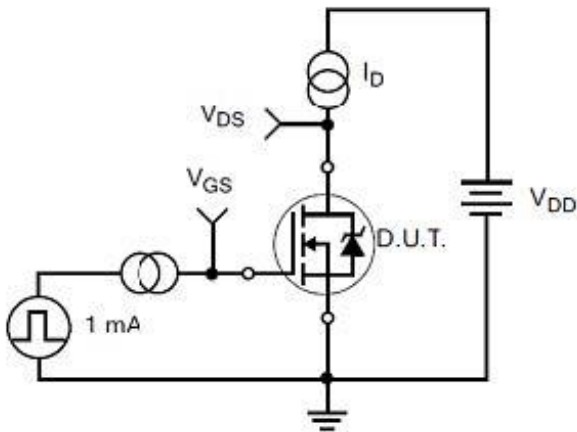


Fig.17 Resistive Switching Test Circuit

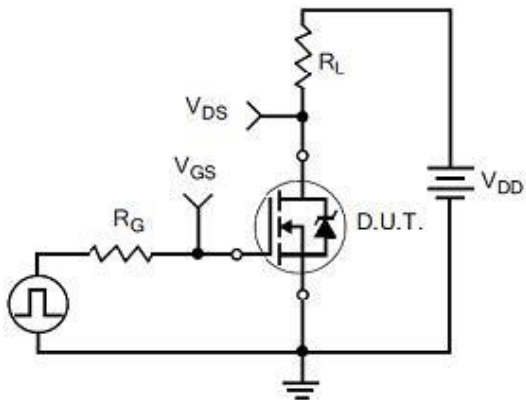


Fig.14 Typical Gate Charge vs. Gate to Source Voltage

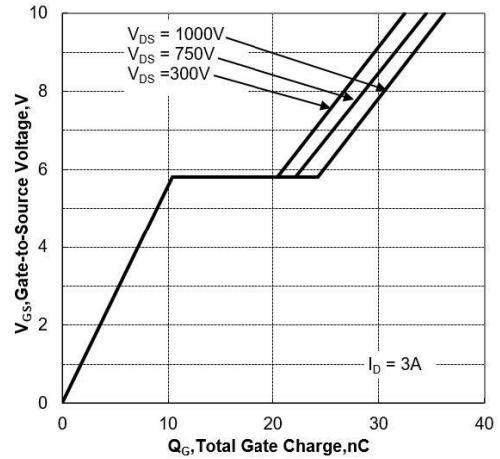


Fig.16 Gate Charge Waveforms

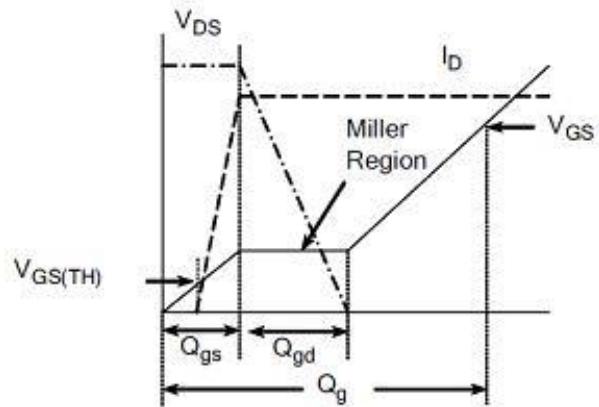


Fig.18 Resistive Switching Waveforms

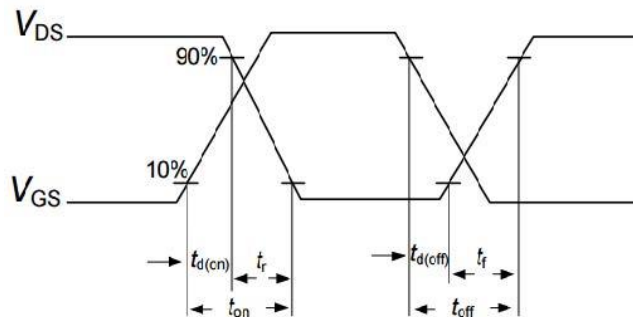




Fig.19 Diode Reverse Recovery Test Circuit

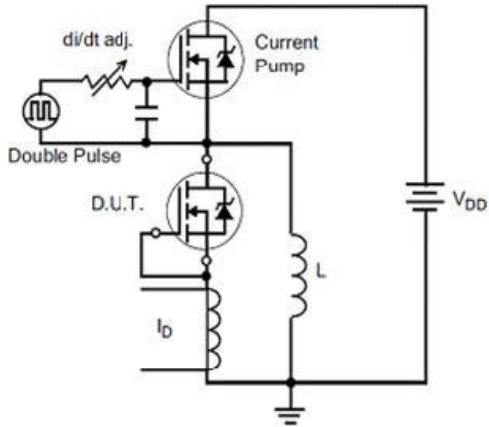


Fig.20 Diode Reverse Recovery Waveform

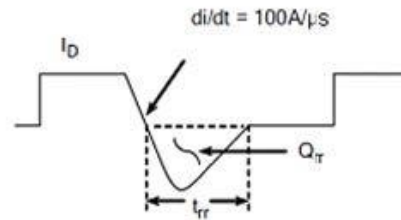


Fig.21 Unclamped Inductive Switching Test Circuit

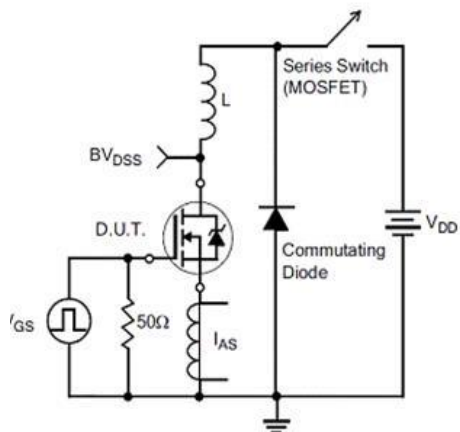
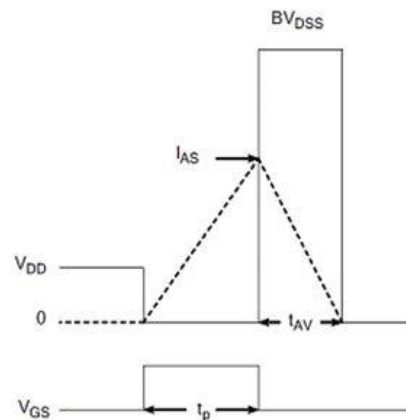


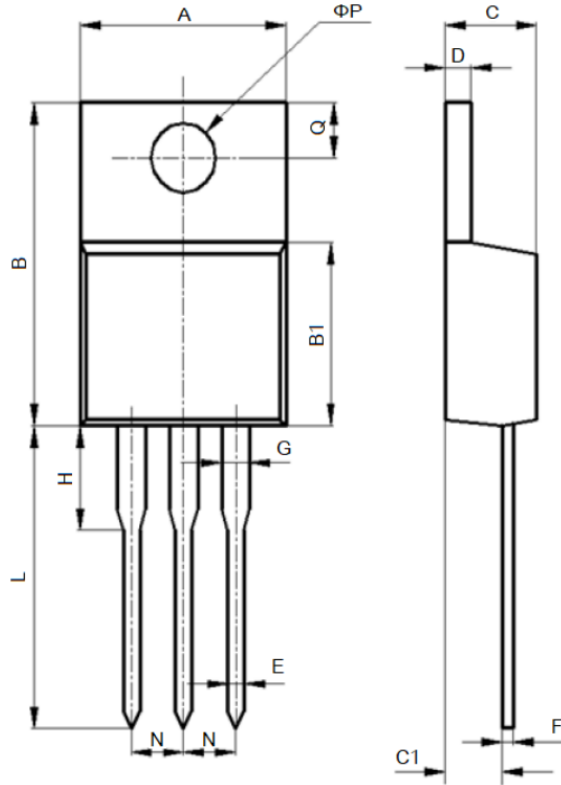
Fig.22 Unclamped Inductive Switching Waveform





PACKAGE INFORMATION

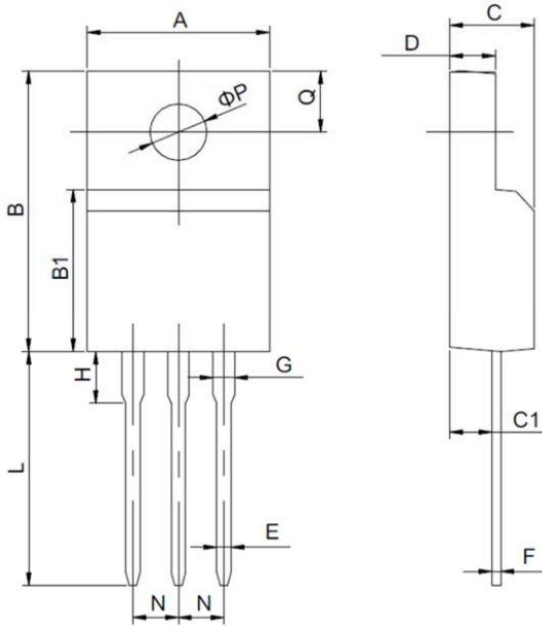
Dimension in TO-220 (Unit: mm)



Symbol	Min.	Max.
A	9.600	10.600
B	15.00	16.000
B1	8.900	9.500
C	4.300	4.800
C1	2.300	3.100
D	1.200	1.400
E	0.700	0.900
F	0.300	0.600
G	1.170	1.370
H	2.700	3.800
L	12.600	14.800
N	2.340	2.740
Q	2.400	3.000
ΦP	3.500	3.900



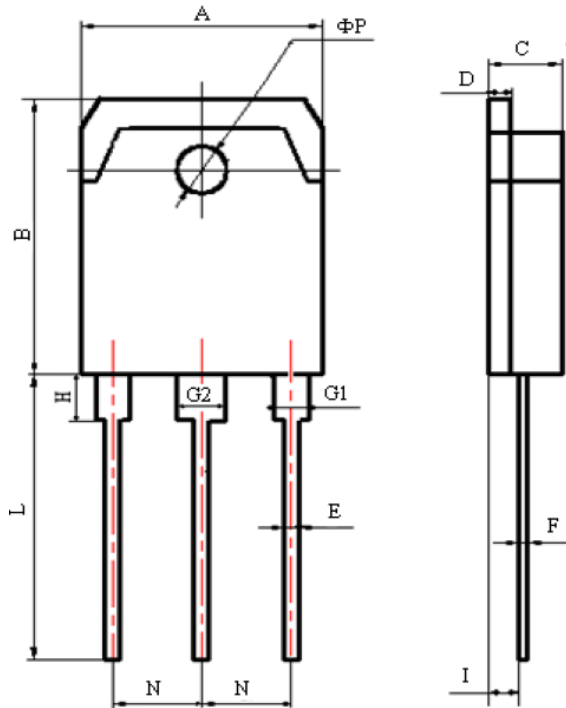
Dimension in TO-220F (Unit: mm)



Symbol	Min.	Max.
A	9.600	10.400
B	15.400	16.200
B1	8.900	9.500
C	4.300	4.900
C1	2.100	3.000
D	2.400	3.000
E	0.600	1.000
F	0.300	0.600
G	1.120	1.420
H	1.600	3.800
L	12.000	14.000
N	2.340	2.740
Q	3.150	3.550
ΦP	2.900	3.300



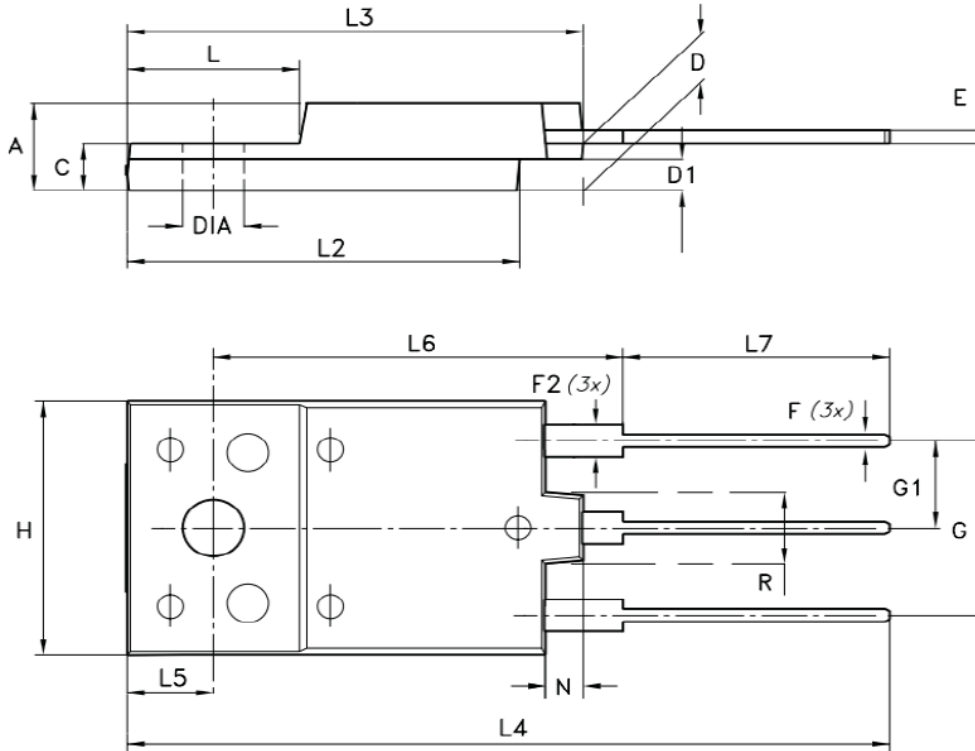
Dimension in TO-3PN (Unit: mm)



Symbol	Min.	Max.
A	15.000	16.000
B	19.200	20.600
C	4.600	5.000
D	1.400	1.600
E	0.900	1.100
F	0.500	0.700
G1	2.000	2.200
G2	3.000	3.200
H	3.000	3.700
I	1.200	2.90
L	19.000	21.000
N	5.250	5.650
ΦP	3.100	3.300



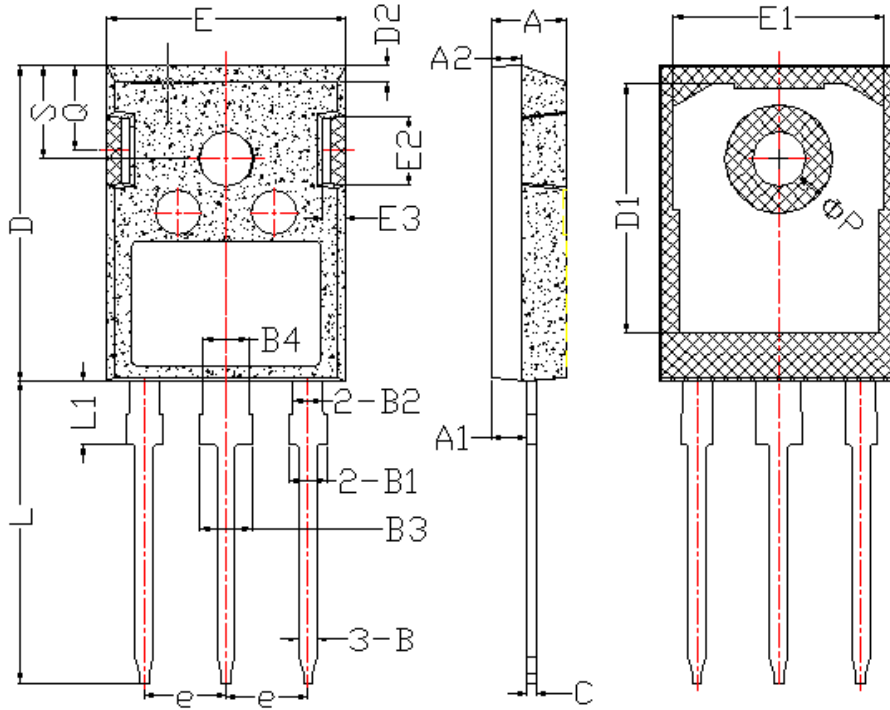
Dimension in TO-3PF (Unit: mm)



Symbol	Min.	Max.
A	5.300	5.700
C	2.800	3.200
D	3.100	3.500
D1	1.800	2.200
E	0.800	1.100
F	0.650	0.950
F2	1.800	2.200
G	10.300	11.500
G1	5.450 REF	
H	15.300	15.700
L	9.800	10.200
L2	22.800	23.200
L3	26.300	26.700
L4	43.200	44.400
L5	4.300	4.700
L6	24.300	24.700
L7	14.600	15.000
N	1.800	2.200
R	3.800	4.200
DIA	3.400	3.800



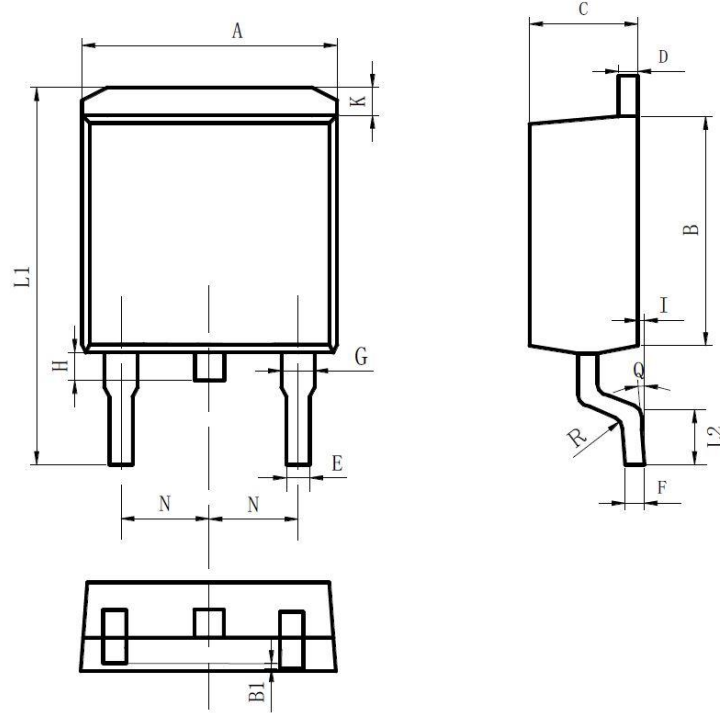
Dimension in TO-247 (Unit: mm)



Symbol	Min.	Max.
A	4.600	5.200
A1	2.200	2.600
B	0.900	1.400
B1	1.750	2.350
B2	1.750	2.150
B3	2.800	3.350
B4	2.800	3.150
C	0.500	0.700
D	20.600	21.300
D1	16.000	18.000
E	15.500	16.100
E1	13.000	14.700
E2	3.800	5.300
E3	0.800	2.600
e	5.200	5.700
L	19.000	20.500
L1	3.900	4.600
ΦP	3.300	3.700
Q	5.200	6.000
S	5.800	6.600



Dimension in TO-263-2 (Unit: mm)



Symbol	Min.	Max.
A	9.800	10.400
B	8.900	9.500
B1	0.000	0.100
C	4.400	4.800
D	1.160	1.370
E	0.700	0.950
F	0.300	0.600
G	1.070	1.470
H	1.300	1.800
K	0.950	1.370
L1	14.500	16.500
L2	1.600	2.300
I	0.000	0.200
Q	0°	8°
R	0.4°	
N	2.390	2.690



IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc. integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or server property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.