DESCRIPTION

The AM60R150A is available in TO-247, TO-262-3 and TO-263-2 packages.

BVDSS	RDSON	ID
650V	0.13Ω	23A

FEATURE

- Fast body diode MOSFET
- Fast Switching
- Improved dv/dt capability

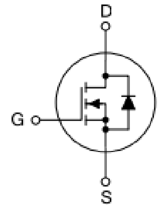
APPLICATION

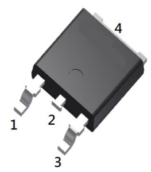
- High frequency switching mode power supply
- Applications using the following topologies: LLC / Phase shifted bridge (ZVS) /3-level Inverter

ORDERING INFORMATION

Package Type	Part Number	
TO-247 SPQ: 30pcs/Tube	TL3F	AM60R150ATL3FU
		AM60R150ATL3FVU
TO-262-3 SPQ: 50pcs/Tube	TS3	AM60R150ATS3U
		AM60R150ATS3VU
TO-263-2 SPQ: 800pcs/Reel	S2	AM60R150AS2R
		AM60R150AS2VR
Note	U: Tube R: Tape & Reel V: Halogen free Package	
AiT provides all RoHS products		

PIN DESCRIPTION





TO-263-2

Pin#			Symbol	Function
TO-247	TO-262-3	TO-263-2		
1	1	1	G	Gate
2	2	2,4	D	Drain
3	3	3	S	Source

ABSOLUTE MAXIMUM RATINGS

T_C = 25°C, unless otherwise specified.

V_{DSS}, Drain-to-Source Voltage		600V
I_D, Continuous Drain Current		23A
I_D, Continuous Drain Current T_C = 100 °C		14A
I_{DM}, Pulsed Drain Current (1)		69A
V_{GS}, Gate-to-Source Voltage		±30V
E_{AS}, Single Pulse Avalanche Energy (2)		600mJ
dv/dt, Peak Diode Recovery dv/dt (3)		15V/ns
P_D, Power Dissipation	TO-262-3, TO-263-2	220W
P_D, Derating Factor above 25°C		1.75W/℃
T_J, Operating Junction Temperature Range		150℃
T_{STG}, Storage Temperature Range		-55℃~+150℃
T_L, Maximum Temperature for Soldering		300℃
$R_{\theta JA}$, Junction-to-Ambient		62.5℃/W
$R_{\theta JC}$, Junction-to-Case		0.57℃/W

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) L=20mH, V_{Ds}=50V, Start T_J=25℃

(3) I_{SD} =23A,di/dt ≤100A/us, V_{DD}≤B_{VDS}, Start T_J=25℃

ELECTRICAL CHARACTERISTICS

T_C = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
OFF Characteristics						
Drain to Source Breakdown Voltage	V_{DSS}	V_{GS}=0V, I_D=250μA	600	-	-	V
BV_{DSS} Temperature Coefficient	ΔBV_{DSS} / ΔT_J	I_D=250μA Reference 25℃	-	0.63	-	V/℃
Drain to Source Leakage Current	I_{DSS}	V_{DS}=600V, V_{GS}=0V, T_J=25℃	-	-	10	μA
		V_{DS}=480V, V_{GS}=0V, T_J=125℃	-	-	500	

Gate to Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+30V	-	-	100	nA
Gate to Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-30V	-	-	-100	nA
ON Characteristics						
Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=9A (4)	-	0.13	0.15	Ω
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=250μA(4)	3	-	5	V
Dynamic Characteristics						
Gate resistance	R_g	f=1MHz	-	3.2	-	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	1810	-	pF
Output Capacitance	C_{oss}		-	103	-	
Reverse Transfer Capacitance	C_{rss}		-	52	-	
Switching Characteristics						
Turn-on Delay Time	$t_{d\ (ON)}$	I_D=8.2A, V_{DD}=300V, V_{GS}=10V, R_G=51Ω	-	82	-	ns
Rise Time	t_r		-	62	-	
Turn-Off Delay Time	$t_{d\ (OFF)}$		-	215.6	-	
Fall Time	t_f		-	44.4	-	
Total Gate Charge	Q_g	I_D=11A, V_{DD}=400V, V_{GS}=10V	-	45	-	nC
Gate to Source Charge	Q_{gs}		-	12	-	
Gate to Drain (“Miller”) Charge	Q_{gd}		-	17	-	
Source-Drain Diode Characteristics						
Continuous Source Current (Body Diode)	I_S	T_c=25℃	-	-	23	A
Maximum Pulsed Current (Body Diode)	I_{SM}		-	-	69	A
Diode Forward Voltage	V_{SD}	I_S=11A , V_{GS}=0V (4)	-	-	1.2	V
Reverse Recovery Time	T_{rr}	I_S=23A, Tj=25℃ dIF/dt =100A/μs V_{GS}=0V	-	110	-	ns
Reverse Recovery Charge	Q_{rr}		-	564.9	-	nC
Reverse Recovery Current	I_{rrm}		-	8	-	A

(1) The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
(2) The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
(3) The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation
(4) Pulse width tp≤300μs, δ≤2%

TYPICAL PERFORMANCE CHARACTERISTICS

Fig 1. Typical Output Characteristics

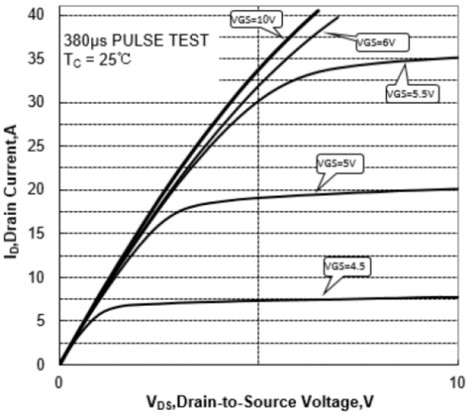


Fig 2. Typical Transfer Characteristics

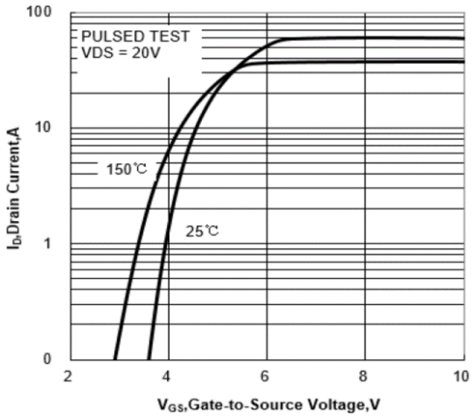


Fig3. Typical Drain to Source ON Resistance vs. Drain Current

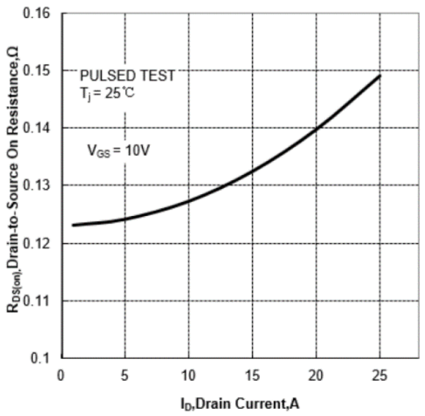


Fig4. Typical Drain to Source on Resistance vs. Junction Temperature

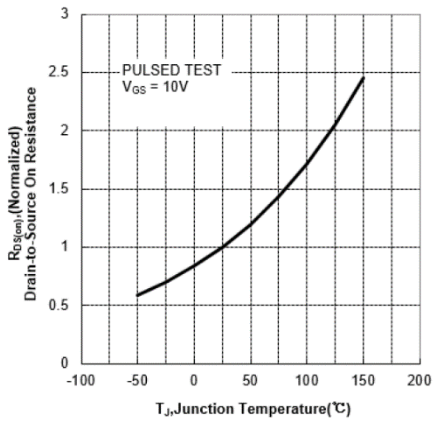


Fig5. Typical Threshold Voltage vs. Junction Temperature

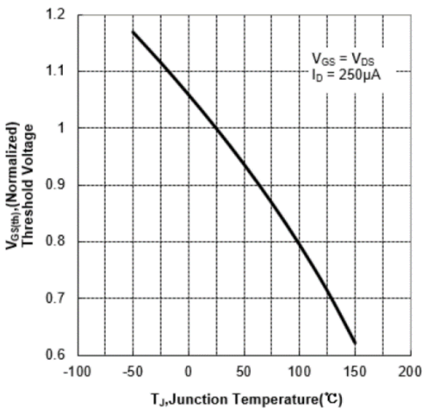


Fig6. Typical Breakdown Voltage vs. Junction Temperature

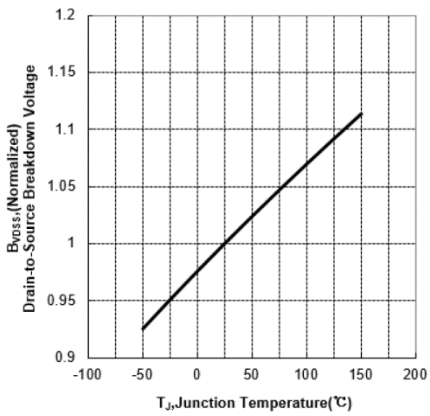


Fig7. Typical Capacitance
vs. Drain to Source Voltage

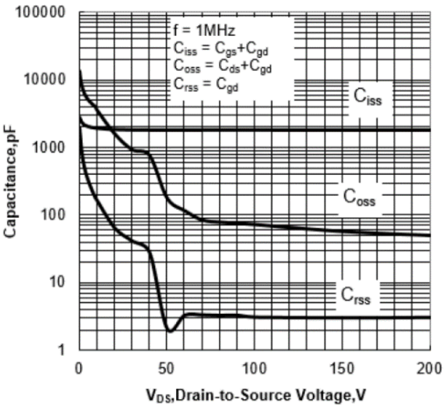


Fig8. Typical Gate Charge
vs. Gate to Source Voltage

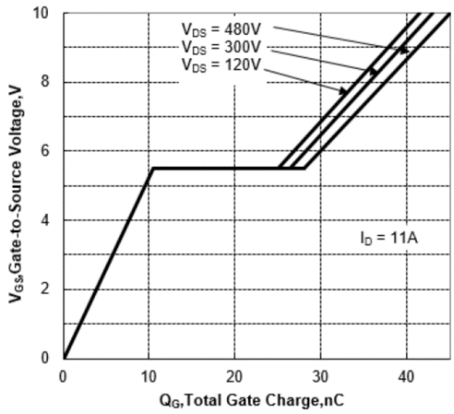


Fig9. Gate Charge Test Circuit

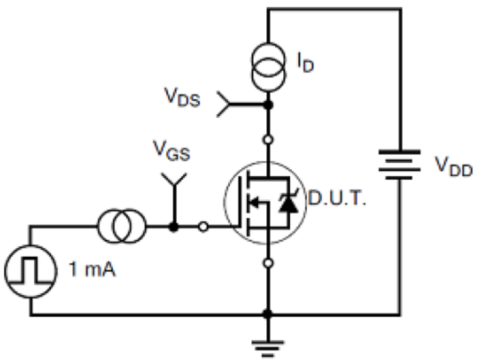


Fig10. Gate Charge Waveforms

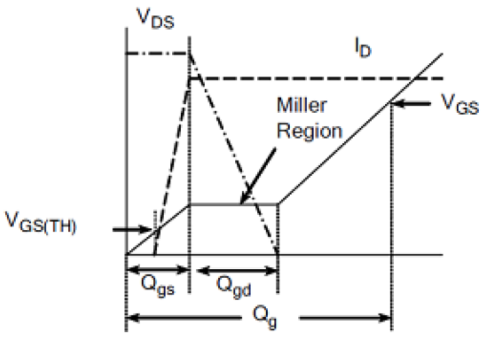


Fig11. Resistive Switching Test Circuit

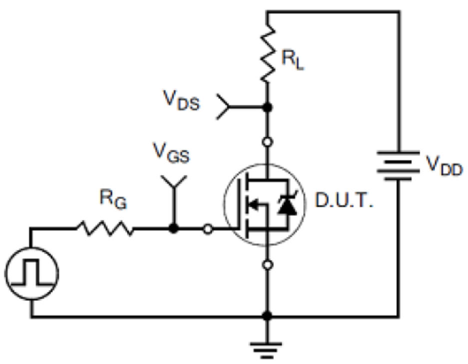


Fig12. Resistive Switching Waveforms

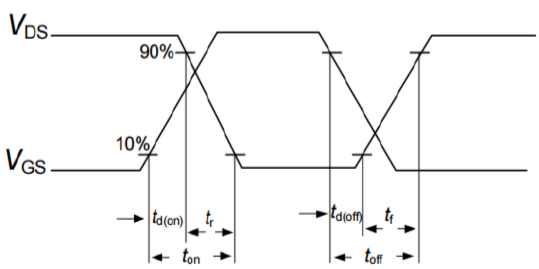


Fig 13. Diode Reverse Recovery Test Circuit

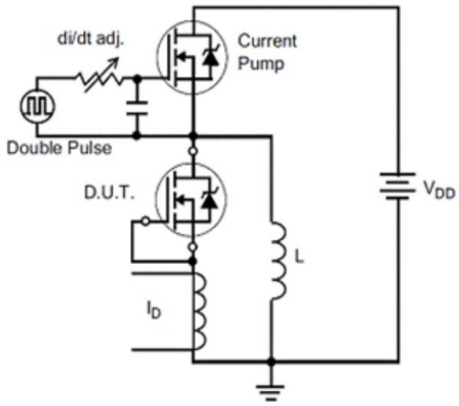


Fig 14. Diode Reverse Recovery Waveform

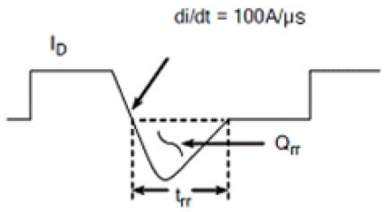


Fig15. Unclamped Inductive Switching Test Circuit

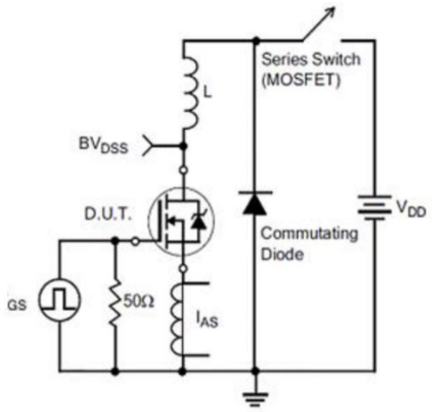
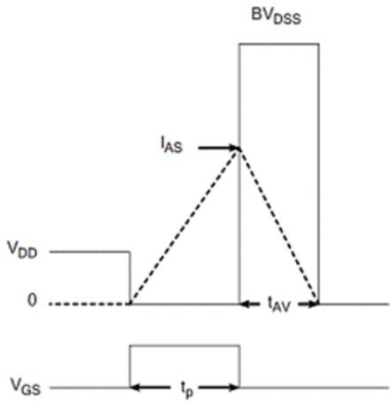
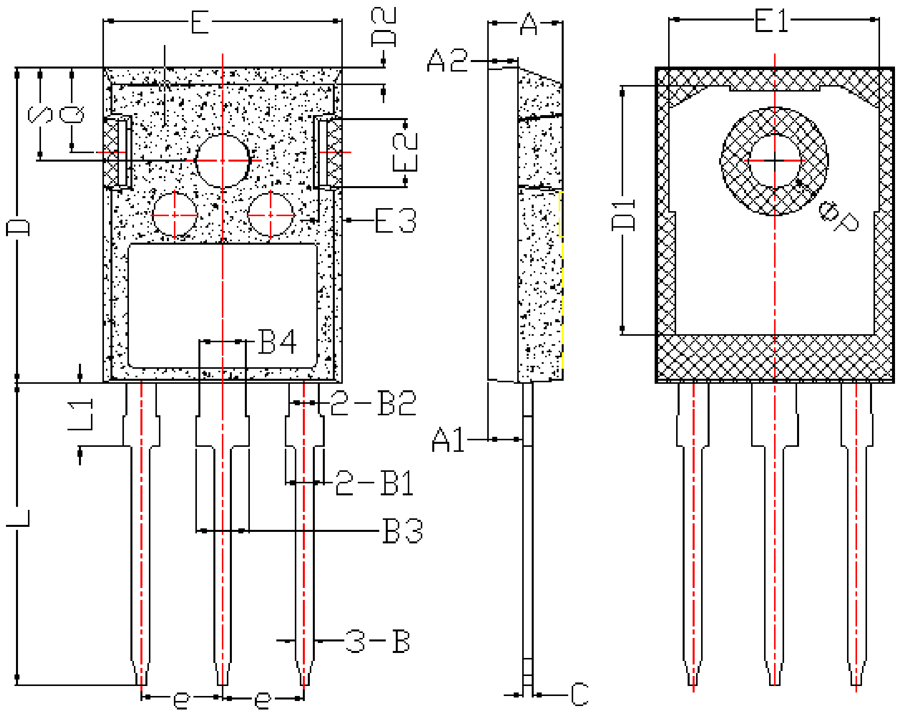


Fig16. Unclamped Inductive Switching Waveform



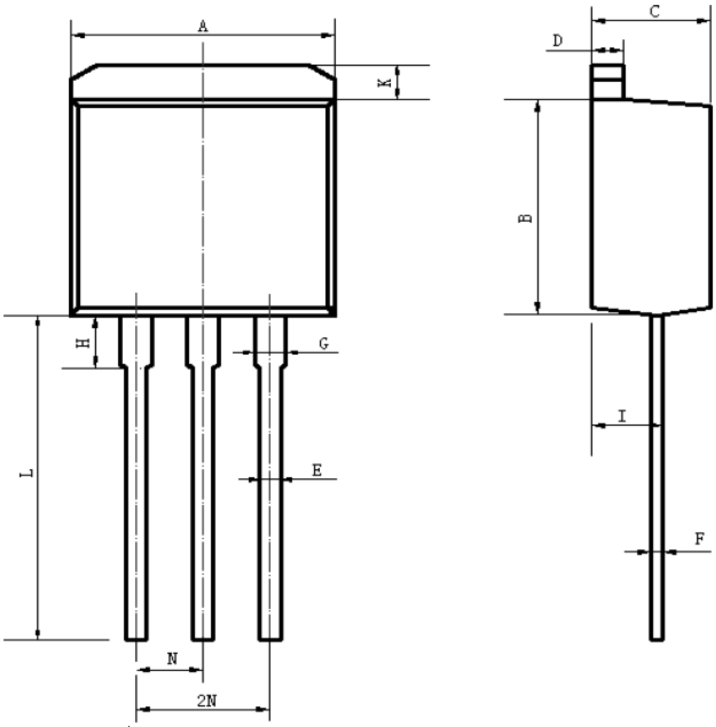
PACKAGE INFORMATION

Dimension in TO-247 (Unit: mm)



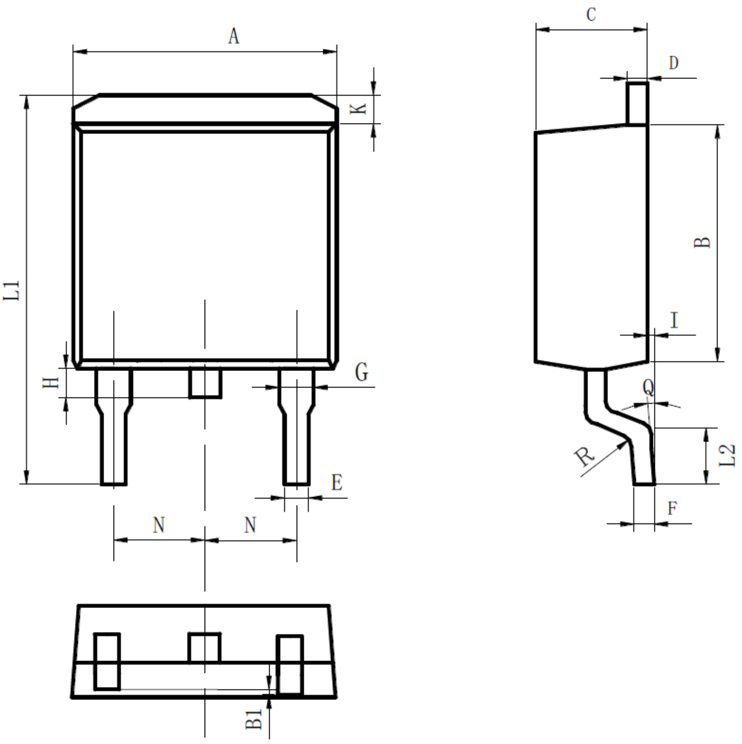
Symbol	Min.	Max.
A	4.600	5.200
A1	2.200	2.600
B	0.900	1.400
B1	1.750	2.350
B2	1.750	2.150
B3	2.800	3.350
B4	2.800	3.150
C	0.500	0.700
D	20.600	21.300
D1	16.000	18.000
E	15.500	16.100
E1	13.000	14.700
E2	3.800	5.300
E3	0.800	2.600
e	5.200	5.700
L	19.000	20.500
L1	3.900	4.600
ΦP	3.300	3.700
Q	5.200	6.000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

Dimension in TO-262-3 (Unit: mm)



Symbol	MILLIMETERS	
	Min.	Max.
A	9.800	10.400
B	8.900	9.500
C	4.300	4.800
D	1.150	1.400
E	0.700	0.910
F	0.280	0.550
G	1.070	1.470
H	3.370	3.770
I	2.500	2.900
K	0.900	1.400
L	12.700	14.700
N	2.350	2.700

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



Symbol	MILLIMETERS	
	Min.	Max.
A	9.800	10.400
B	8.900	9.500
B1	0	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	0.2
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.