DESCRIPTION

The AM055NS10H is available in TO-220 and TO-263 Packages.

BVDSS	RDSON	ID
100V	4.8mΩ	120A

APPLICATION

- Synchronous rectification
- High speed switching applications

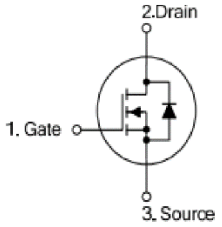
ORDERING INFORMATION

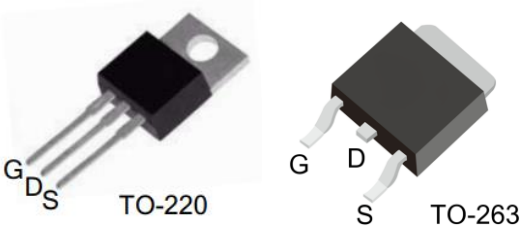
Package Type	Part Number	
TO-220 SPQ:50pcs /Tube	T3	AM055NS10HT3U
		AM055NS10HT3VU
TO-263 SPQ:800pcs /Reel	S2	AM055NS10HS2R
		AM055NS10HS2VR
Note	V: Halogen free Package R: Tape & Reel U: Tube	
AiT provides all RoHS products		

FEATURE

- Fast Switching
- $R_{DS(ON)typ.}$=4.8mΩ @ V_{GS}=10V
- Low On-Resistance
- Low Gate Charge
- Low Reverse transfer capacitances
- High avalanche ruggedness
-

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}	100	V
Continuous Drain Current, Silicon Limited	I_D	127	A
Continuous Drain Current, Package Limited		120	A
Continuous Drain Current @T_C=100°C, Silicon Limited		80.7	A
Pulsed Drain Current	I_{DM}(1)	480	A
Gate-Source Voltage	V_{GS}	±20	V
Avalanche Energy	E_{AS}(2)	306	mJ
Power Dissipation	P_D	173.6	W
Derating Factor above 25°C		1.39	W/℃
Storage Temperature Range	T_{STG}	-55 to 150	℃
Junction Temperature	T_J	150	℃
Maximum Temperature for Soldering	T_L	260	℃
THERMAL RESISTANCE			
Thermal Resistance, Junction-Case	$R_{\theta JC}$	0.72	℃/W
Thermal Resistance, Junction-Ambient	$R_{\theta JA}$	62.5	

(1) Repetitive Rating : Pulse width limited by maximum junction temperature

(2) L=0.5mH, Ias=35A, Start T_A =25℃

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.

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	100	110	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		V_{DS}=80V, V_{GS}=0V @T_C=125°C	-	-	100	μA
Gate-Source Forward Leakage	$I_{GSS(F)}$	V_{GS}=+20V	-	-	100	nA
Gate-Source Reverse Leakage	$I_{GSS(R)}$	V_{GS}=-20V	-	-	-100	nA
ON CHARACTERISTICS						
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=50A	-	4.8	5.5	mΩ
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2	3	4	V
Dynamic CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS}=50V,	-	5000	-	pF
Output Capacitance	C_{oss}	V_{GS}=0,	-	878	-	
Reverse Transfer Capacitance	C_{rss}	f=1MHz	-	75	-	
Total Gate Charge	Q_g	V_{DD}=50V,	-	74	-	nC
Gate-Source charge	Q_{gs}	I_D=50A,	-	25	-	
Gate-Drain charge	Q_{gd}	V_{GS}=10V	-	14	-	
Gate resistance	R_G	V_{GS}=0, V_{DS}=0	-	1.7	-	Ω
Switching CHARACTERISTICS						
Turn-on Delay Time	$t_{d(ON)}$	V_{DD}=50V,	-	24	-	nS
Rise Time	t_r	I_D=50A,	-	21	-	
Turn-Off Delay Time	$t_{d(OFF)}$	V_{GS}=10V, R_G=5Ω,	-	50	-	
Fall Time	t_f	Resistive Load	-	27	-	
Source-Drain Diode CHARACTERISTICS						
Continuous Source Current	I_S		-	-	120	A
Maximum Pulsed Current	I_{SM}		-	-	480	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=50A	-	-	1.2	V
Reverse Recovery Time	t_{rr}	Is=50A,V_{GS}=0,	-	66	-	ns
Reverse Recovery Charge	Q_{rr}	di/dt=100A/us	-	150	-	nC

* Pulse width tp≤300μs, δ≤2%.

TYPICAL PERFORMANCE CHARACTERISTICS

Fig.1 Safe Operating Area

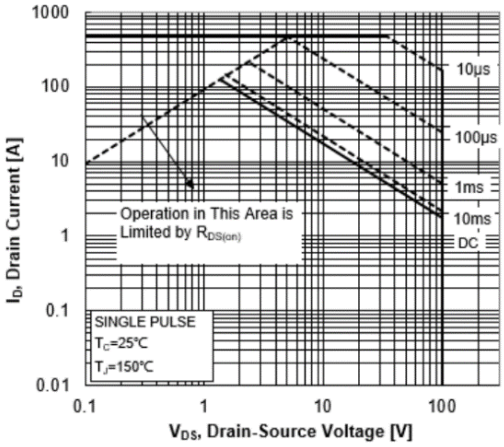


Fig.2 Maximum Power Dissipation Vs Case Temperature

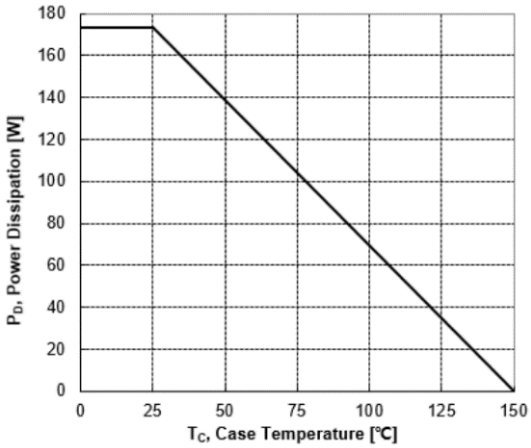


Fig.3 Maximum Continuous Drain Current Vs Case Temperature

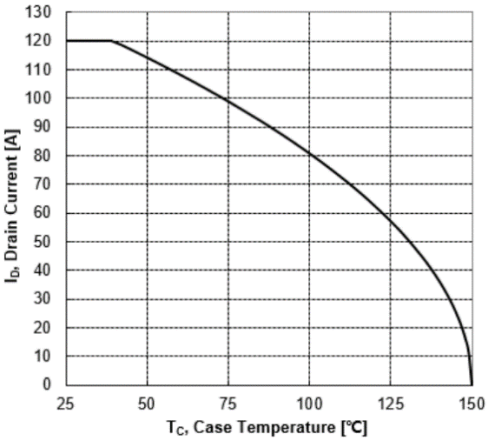


Fig.4 Typical Output Characteristics

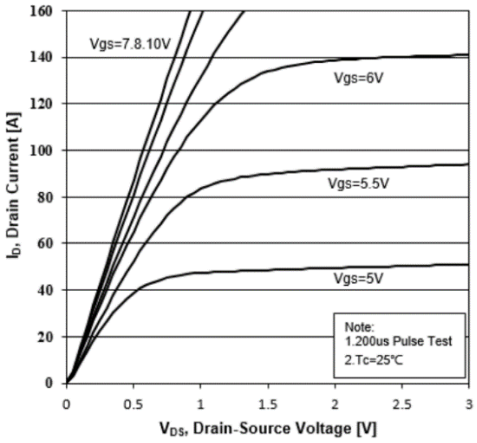


Fig.5 Transient Thermal Impedance

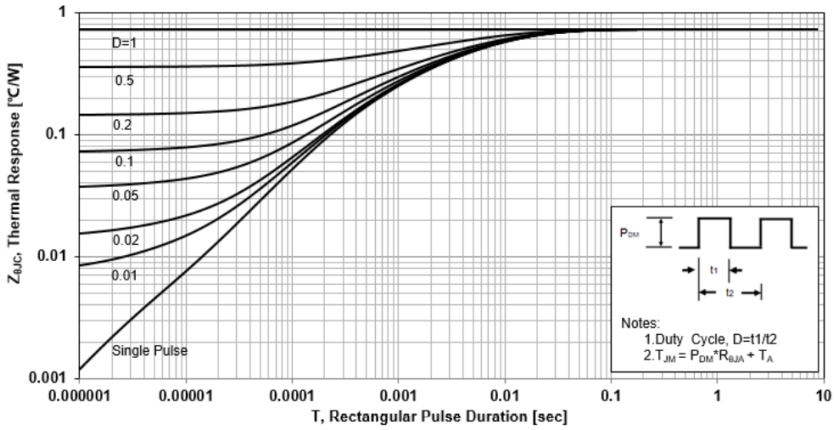


Fig.6 Typical Transfer Characteristics

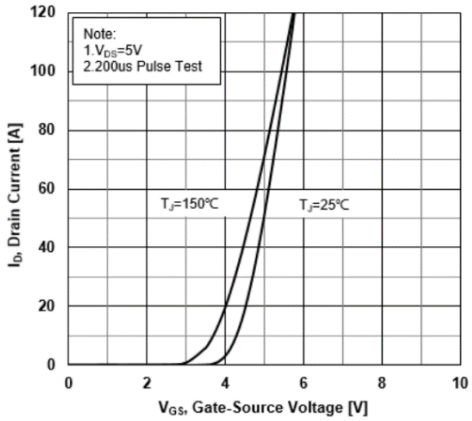


Fig.7 Source-Drain Diode Forward Characteristics

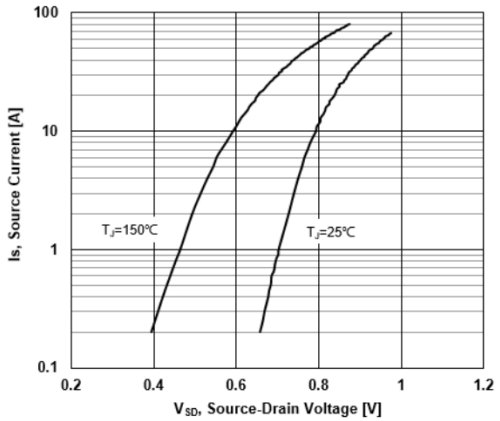


Fig.8 Drain-Source On-Resistance vs Drain Current

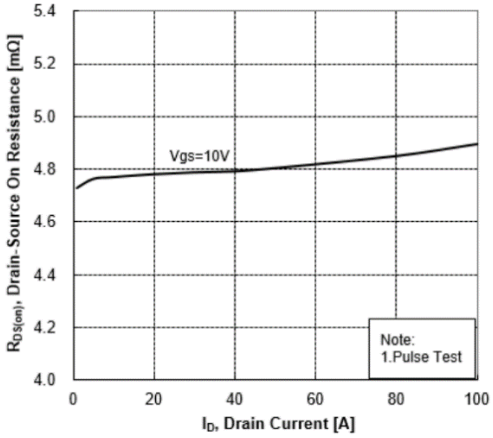


Fig.9 Normalized On-Resistance vs Junction Temperature

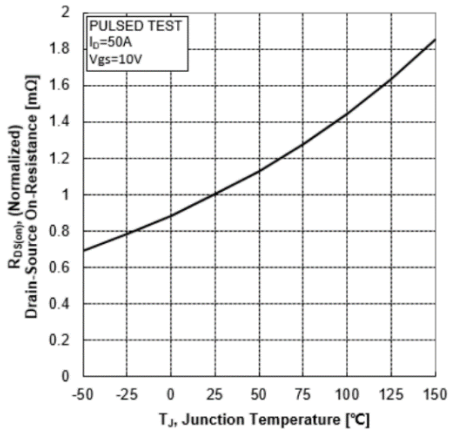


Fig.10 Normalized Threshold Voltage vs Junction Temperature

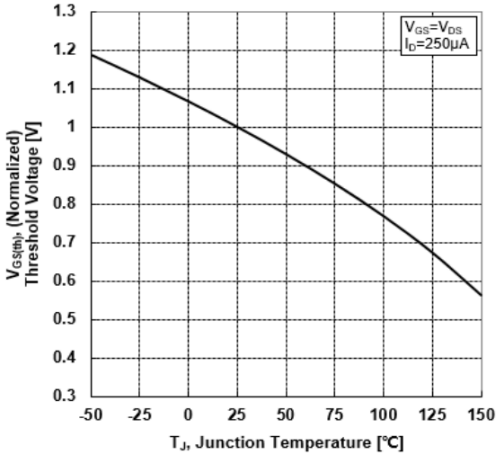


Fig.11 Normalized Breakdown Voltage vs Junction Temperature

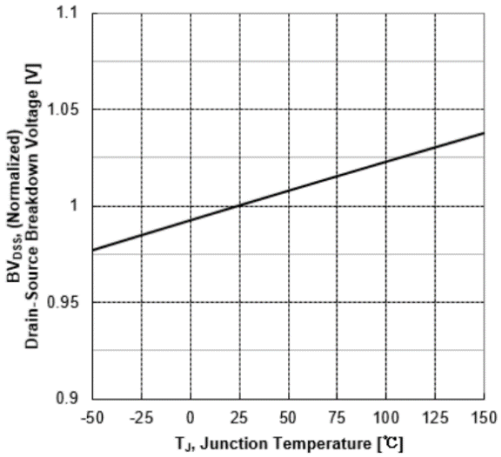


Fig.12 Capacitance Characteristics

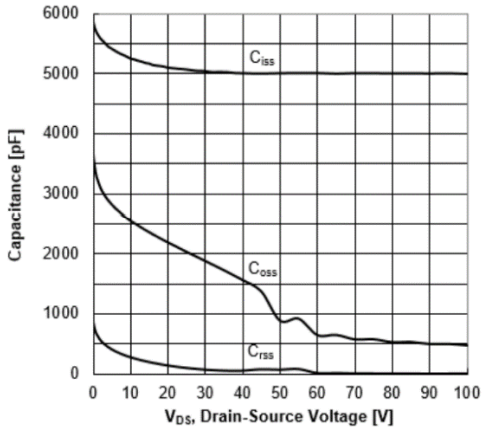


Fig.13 Typical Gate Charge vs Gate-Source Voltage

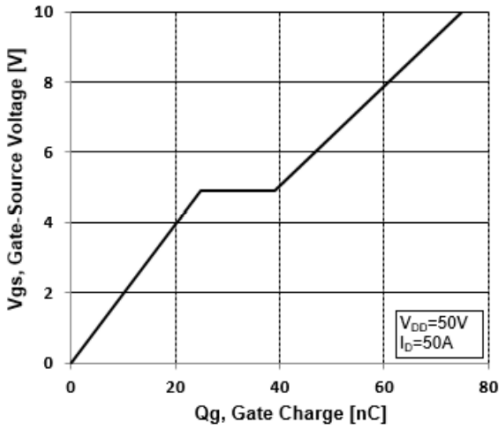


Fig.14 Resistive Switching Test Circuit

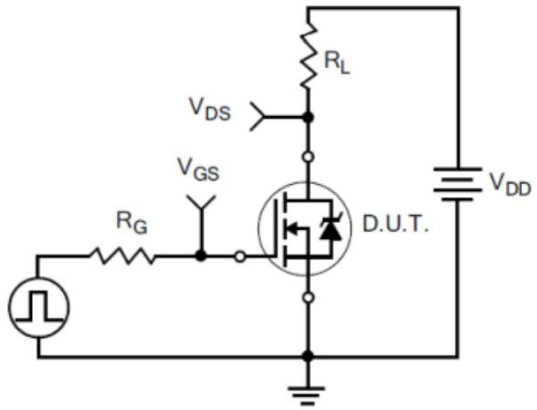


Fig.15 Resistive Switching Waveforms

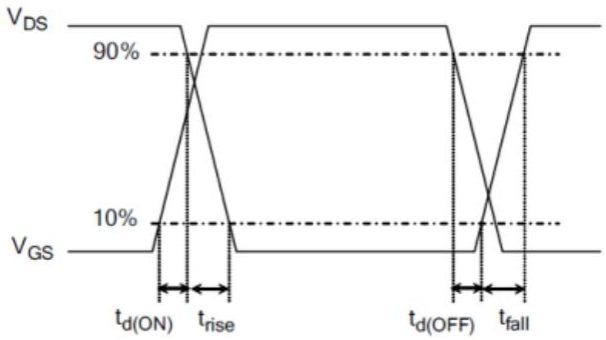


Fig.16 Gate Charge Test Circuit

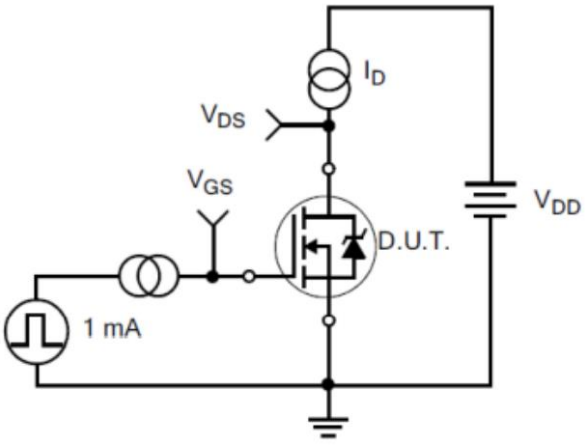


Fig.17 Gate Charge Waveforms

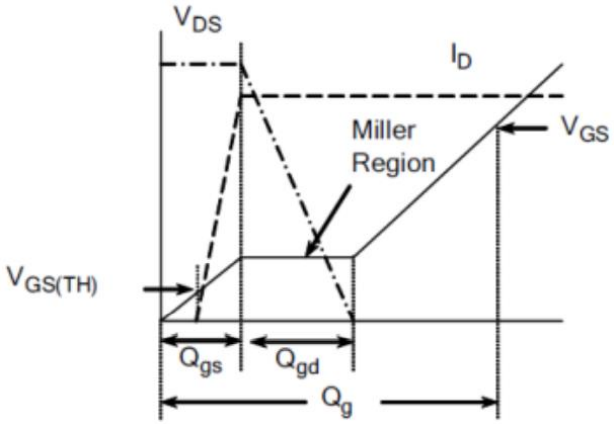


Fig.18 Diode Reverse Recovery Test Circuit

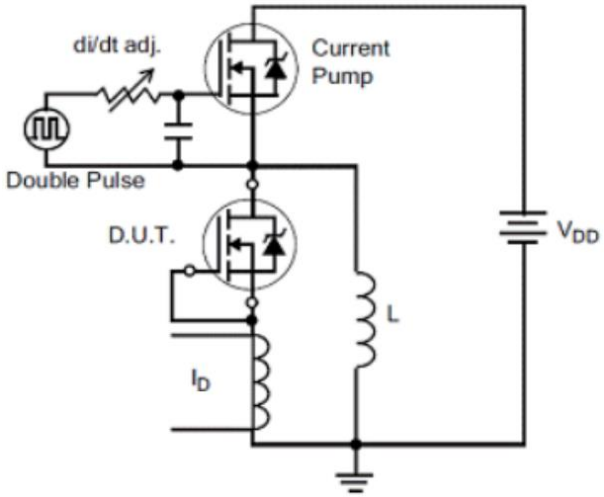


Fig.19 Diode Reverse Recovery Waveform

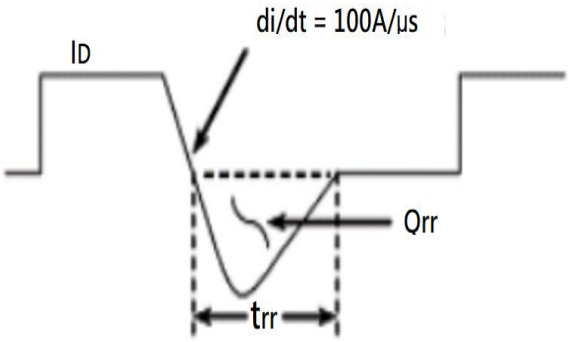


Fig.20 Unclamped Inductive Switching Test Circuit

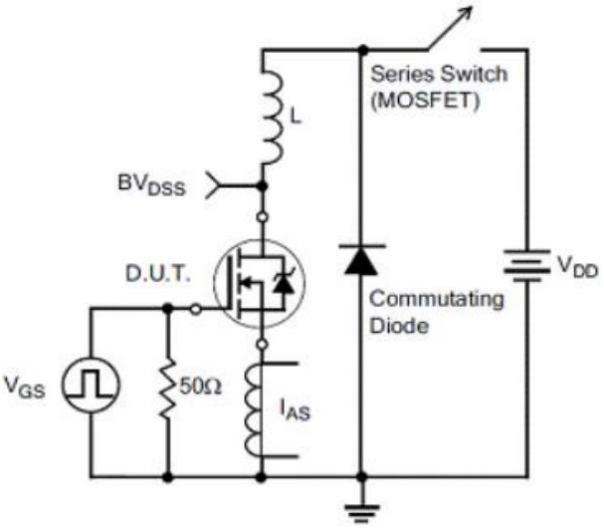
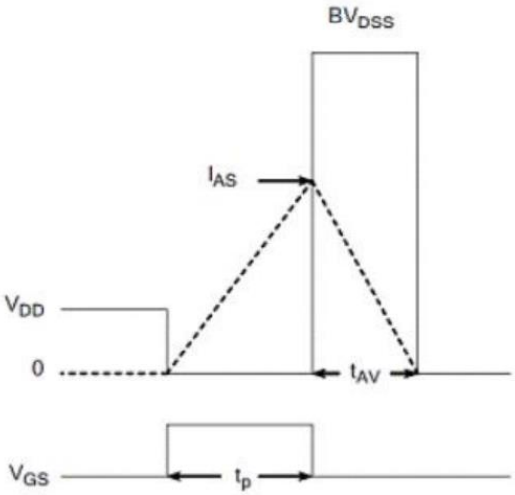


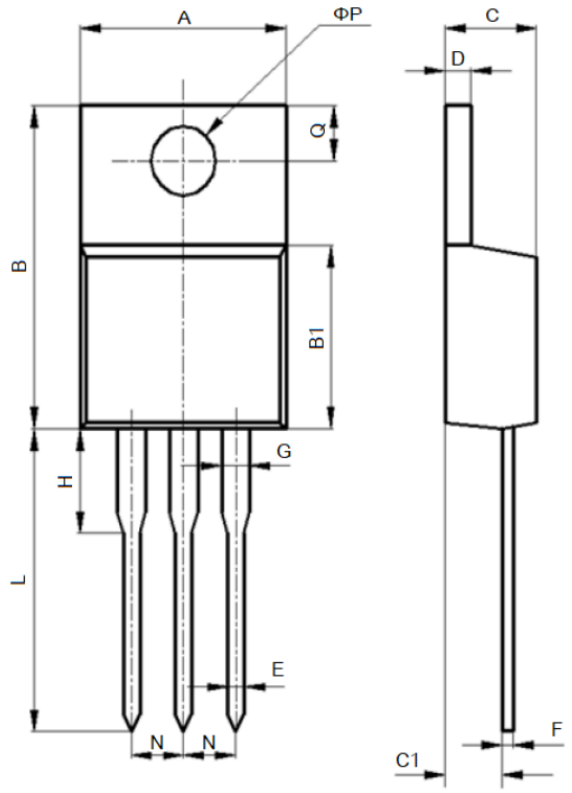
Fig.21 Unclamped Inductive Switching Waveform



$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

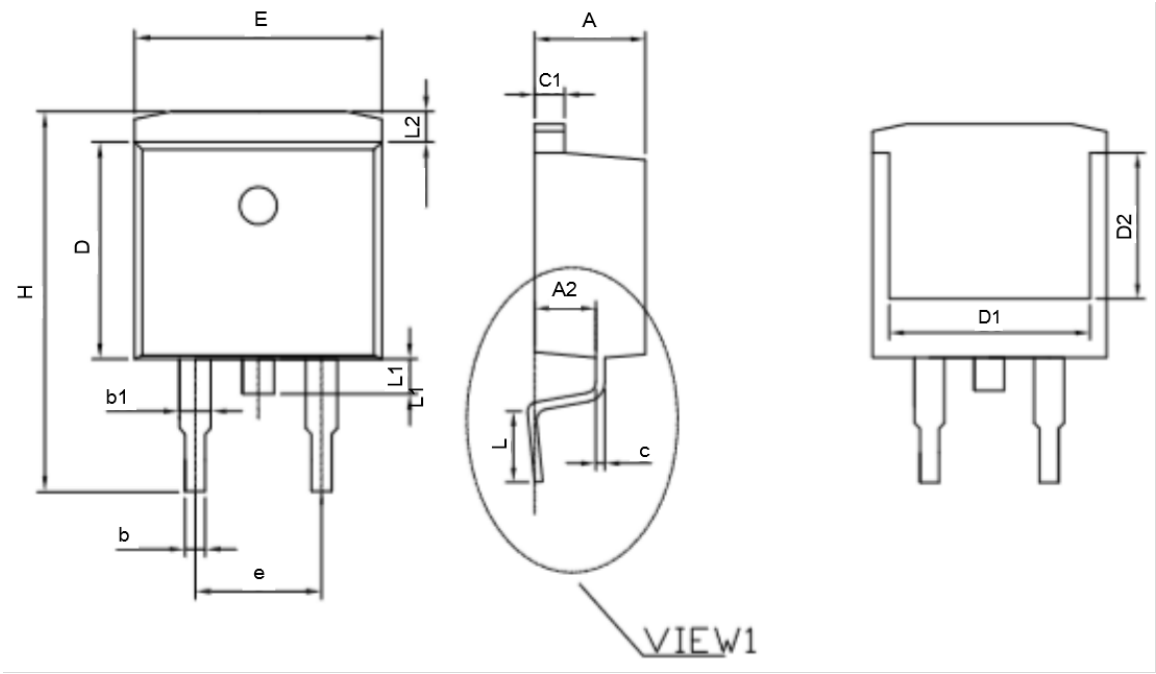
PACKAGE INFORMATION

Dimension in TO-220 (Unit: mm)



Symbol	Min.	Max.
A	9.60	10.6
B	15.0	16.0
B1	8.90	9.50
C	4.30	4.80
C1	2.30	3.10
D	1.20	1.40
E	0.70	0.90
F	0.30	0.60
G	1.17	1.37
H	2.70	3.80
L	12.6	14.8
N	2.34	2.74
Q	2.40	3.00
ΦP	3.50	3.90

Dimension in TO-263 (Unit: mm)



Symbol	Min.	Max.
A	4.400	4.800
A1	0.050	0.300
A2	2.250	2.550
b	0.720	0.920
b1	1.120	1.420
c	0.400	0.600
c1	1.200	1.400
D	8.800	9.400
D1	7.750	8.150
D2	6.550	6.950
E	9.650	10.35
e	4.980	5.180
H	14.70	15.60
L	2.300	2.600
L1	1.200	1.600
L2	0.950	1.300

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