



DESCRIPTION

The AM30T40 is available in a TO-220, TO-252, TO-262-3 and TO-263-2 packages.

AEC-Q101 Qualified is available in TO-252 and TO-263-2 packages.

VCES	VCE (sat)	SCIS
400V	1.25V	300mJ

APPLICATION

- Automotive ignition Coil Driver Circuits
- Coil-On Plug Application

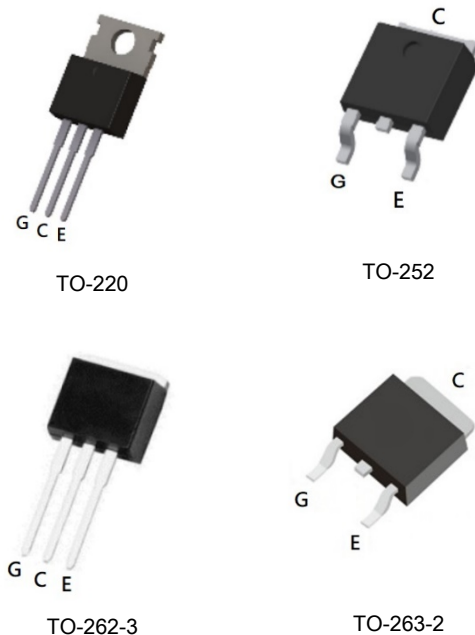
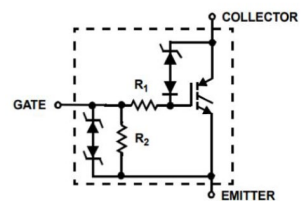
ORDERING INFORMATION

Package Type	Part Number	
TO-220 SPQ: 50pcs/ Tube	T3	AM30T40T3U
		AM30T40T3VU
TO-252 SPQ: 2,500pcs/Reel	D	AM30T40DR
		AM30T40DVR
TO-252 AEC-Q101 SPQ: 2,500pcs/Reel	D	AM30T40DRQ
		AM30T40DVRQ
TO-262-3 SPQ: 50pcs/ Tube	TS3	AM30T40TS3U
		AM30T40TS3VU
TO-263-2 SPQ: 800pcs/Reel	S2	AM30T40S2R
		AM30T40S2VR
TO-263-2 AEC-Q101 SPQ: 800pcs/Reel	S2	AM30T40S2RQ
		AM30T40S2VRQ
Note	V: Halogen free Package R: Tape & Reel U: Tube Q: AEC-Q101 Qualified	
AiT provides all RoHS products		

FEATURE

- Low V_{CEsat}
- High SCIS Energy
- Positive Temperature Coefficient
- Logic Level Gate Drive
- AEC-Q101 Qualified.

PIN DESCRIPTION



Pin #		Symbol	Functions
TO-220 TO-262-3	TO-252 TO-263-2		
1	1	G	Gate
2	2,4	C	Collector
3	3	E	Emitter

**ABSOLUTE MAXIMUM RATINGS**At $T_c = 25^\circ\text{C}$, unless otherwise specified

V_{CES} , Collector-Emitter Voltage ($I_c = 1\text{mA}$)		430V
V_{ECS} , Emitter to Collector Voltage ($I_c = 10\text{mA}$)		24V
E_{SCIS} , SCIS Energy	$T_J = 25^\circ\text{C}$, $ISCIS = 14.2\text{A}$	300mJ
	$T_J = 150^\circ\text{C}$, $ISCIS = 10.6\text{A}$	170mJ
I_c , Collector Current	$T_c = 25^\circ\text{C}$	21A
	$T_c = 100^\circ\text{C}$	17A
E_{SD} , Electrostatic Discharge Voltage (HBM)		4KV
V_{GEM} , Gate- Emitter Voltage Continuous		$\pm 10\text{V}$
P_D , Power Dissipation	$T_c = 25^\circ\text{C}$	150W
T_J, T_{stg} , Operating Junction and Storage Temperature Range		$-40^\circ\text{C} \sim 175^\circ\text{C}$
T_L , Maximum Temperature for Soldering		260°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.

THERMAL CHARACTERISTICS

Parameter	Symbol	RATINGS	Units
Junction-to-Case	$R_{\theta JC}$	1	$^\circ\text{C}/\text{W}$



ELECTRICAL CHARACTERISTICS

At T_C = 25°C, unless otherwise specified

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
OFF Characteristics						
Collector to Emitter Breakdown Voltage	BV _{CER}	V _{GE} =0V, I _C =2mA, R _G = 1KΩ	370	400	430	V
Collector to Emitter Breakdown Voltage	BV _{CES}	V _{GE} =0V, I _C =10mA, R _G = 0Ω	390	420	450	V
Emitter to Collector Breakdown Voltage	BV _{ECS}	V _{GE} =0V, I _C =-75mA	30	-	-	V
Gate to Emitter Breakdown Voltage	BV _{GES}	I _{GES} =±2mA	±12	±14	-	V
Collector to Emitter Leakage Current	I _{CER}	V _{CE} =250V, R _G = 1KΩ, T _J =25°C	-	-	25	μA
		V _{CE} =250V, R _G = 1KΩ, T _J =150°C	-	-	1	mA
Emitter to Collector Leakage Current	I _{ECS}	V _{EC} =24V, T _J =25°C	-	-	1	mA
		V _{EC} =24V, T _J =150°C	-	-	40	mA
Series Gate Resistance	R1		-	70	-	Ω
Gate to Emitter Resistance	R2		10	-	26	KΩ
ON Characteristics						
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =4V, I _C =6A	-	1.25	1.60	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =4.5V, I _C =10A	-	1.50	1.80	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =4.5V, I _C =15A	-	1.90	2.20	V
Gate Threshold Voltage	V _{GE(TH)}	V _{CE} = V _{GE} , I _C =1mA	1.30	-	2.20	V
Pulse width tp≤300μs, δ≤2%						
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GE} =0V, V _{CE} =25V, f=1.0MHz	-	900	-	pF
Output Capacitance	C _{oss}		-	75	-	
Reverse Transfer Capacitance	C _{rss}		-	16	-	
Total Gate Charge	Q _g	I _C =10V, V _{CE} =12V, V _{GE} =5V	-	8	-	nC
Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{CE} =14V, V _{GE} =5V, R _G = 1KΩ	-	0.6	4	μs
Rise Time	t _r		-	2	7	
Turn-Off Delay Time	t _{d(OFF)}	V _{CE} =300V, V _{GE} =5V, R _G = 1KΩ	-	5	15	
Fall Time	t _f		-	2	15	



TYPICAL CHARACTERISTICS

Fig.1 Collector-Emitter Saturation Voltage vs. Junction Temperature

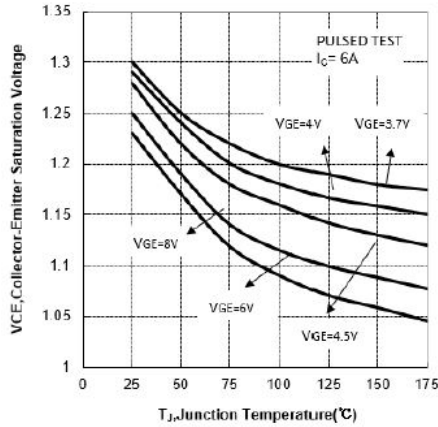


Fig.2 Collector-Emitter Saturation Voltage vs. Junction Temperature

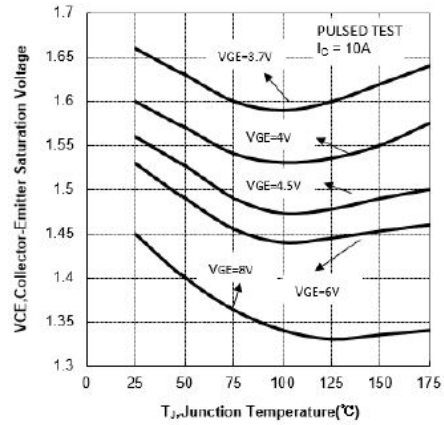


Fig.3 Collector-Emitter Voltage vs. Collector Current

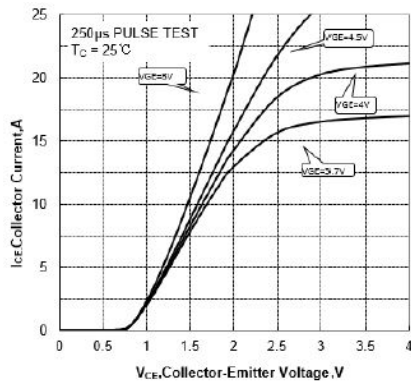


Fig.4 Collector-Emitter Voltage vs. Collector Current

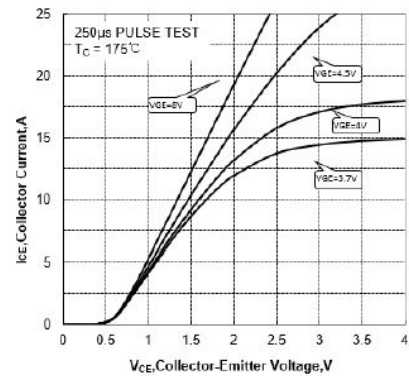


Fig.5 Collector-Emitter Voltage vs. Collector Current

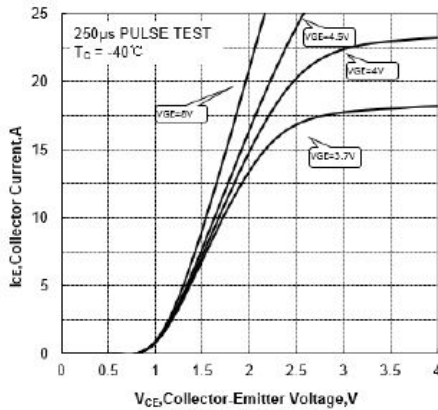


Fig.6 Switching Time vs. Junction Temperature

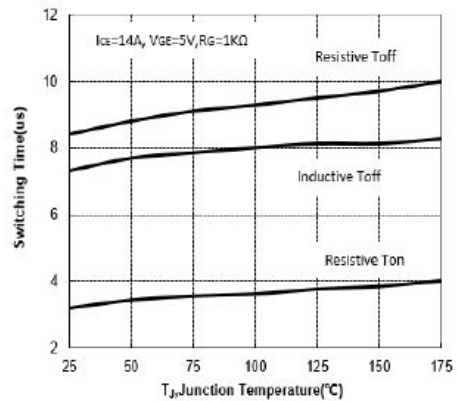




Fig.7 Typical Transfer Characteristics

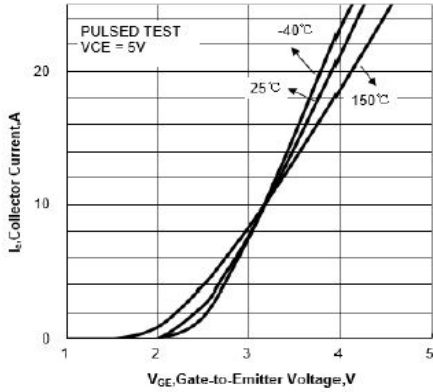


Fig.9 Leakage Current vs. Junction Temperature

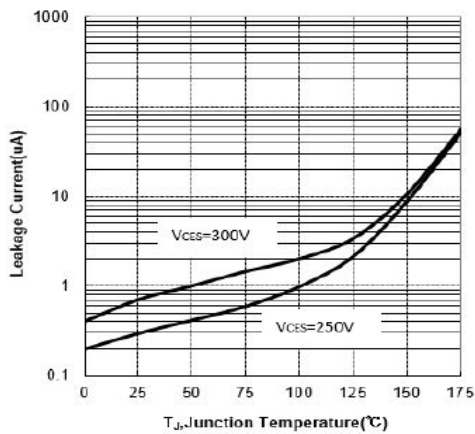


Fig.11 Typical Capacitance vs. Collector-Emmitter Voltage

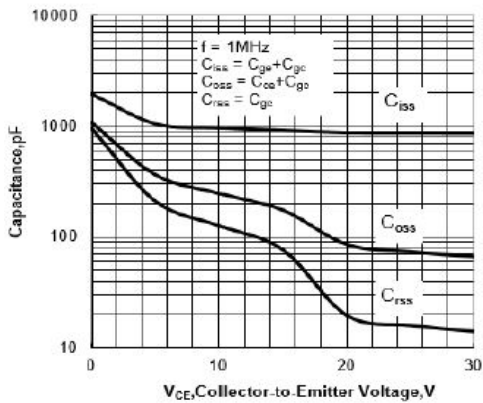


Fig.8 Threshold Voltage vs. Junction Temperature

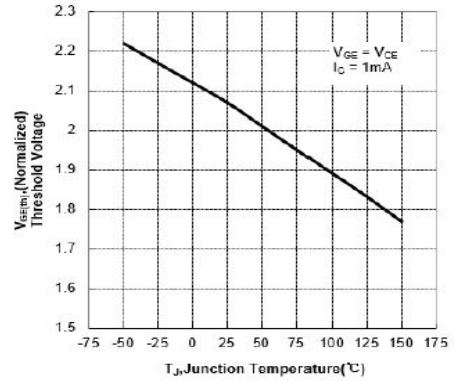


Fig.10 Breakdown Voltage vs. Series Gate Resistance

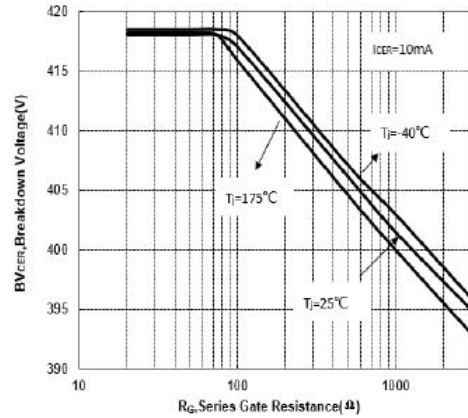


Fig.12 Typical Gate charge

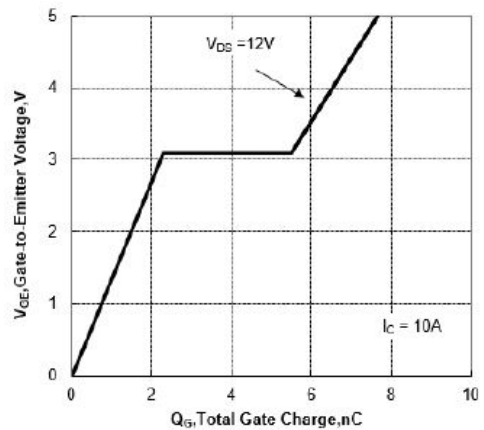




Fig.13 Self Clamped Inductive Switching Current vs. Inductance

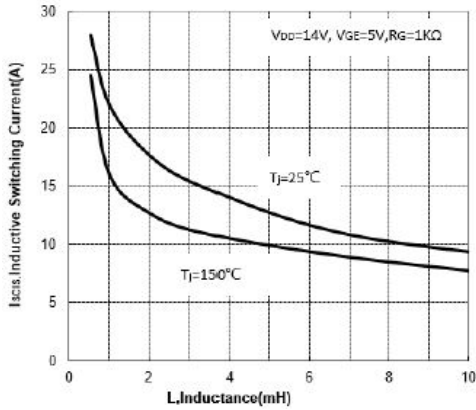


Fig.14 Typical Switching Times vs. Time in Clamp

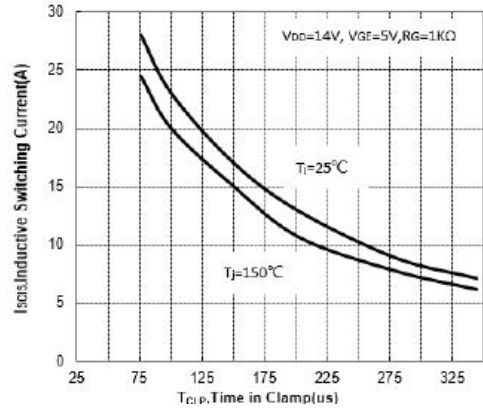


Fig.15 Max Thermal Impedance

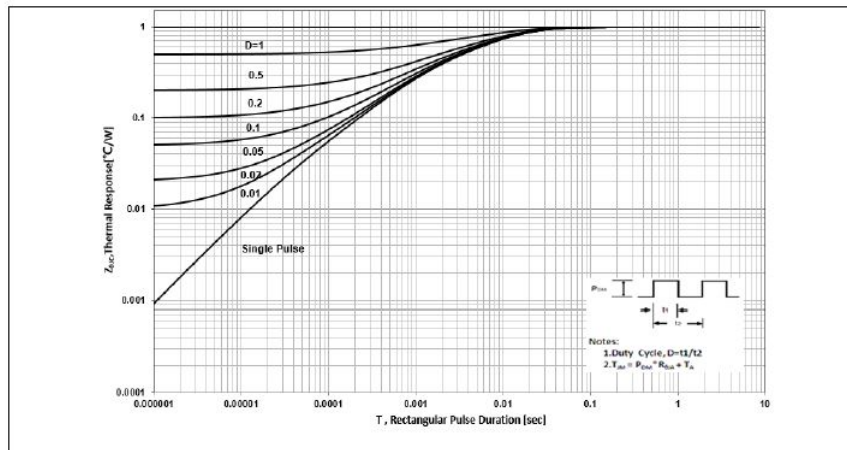


Fig.16 Inductive Switching Test Circuit

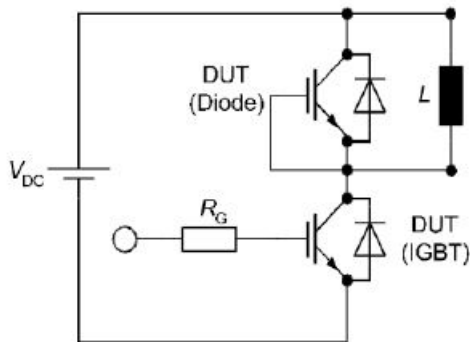


Fig.17 Inductive Switching Waveforms

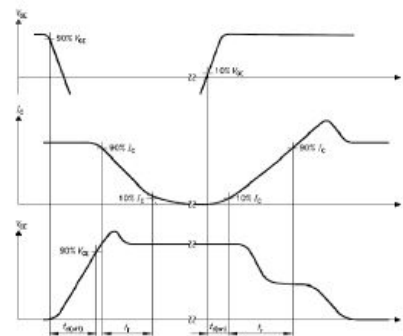




Fig.18 Inductive Switching Waveforms

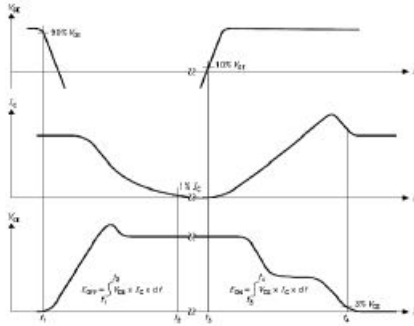


Fig.19 Inductive Switching Waveforms

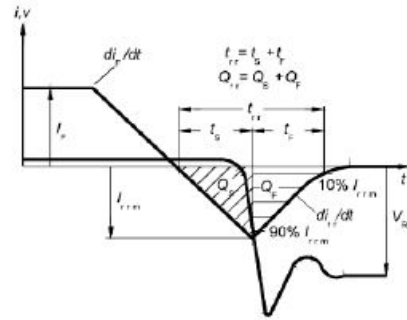


Fig.20 Energy Test Circuit

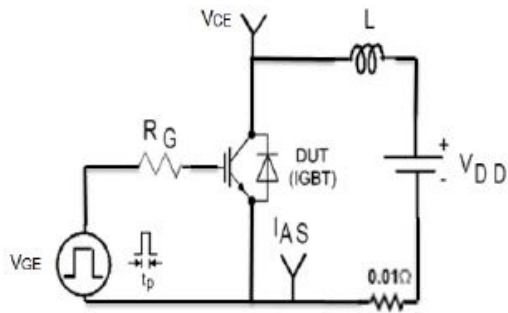
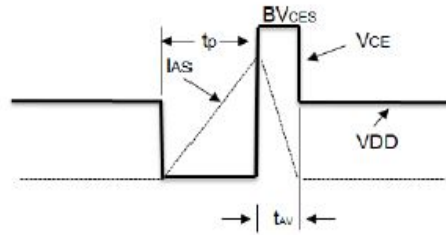


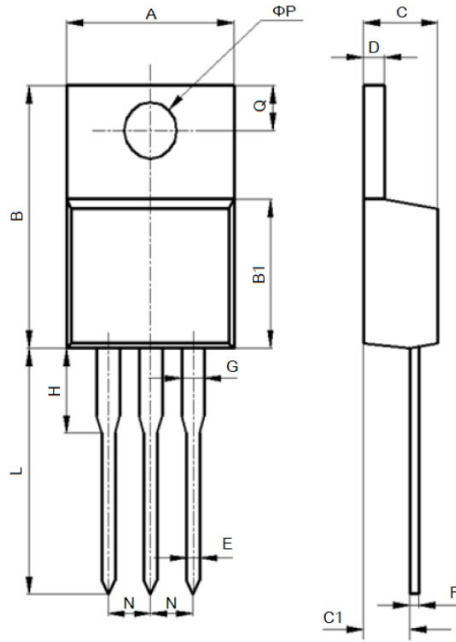
Fig.21 Energy Waveforms





PACKAGE INFORMATION

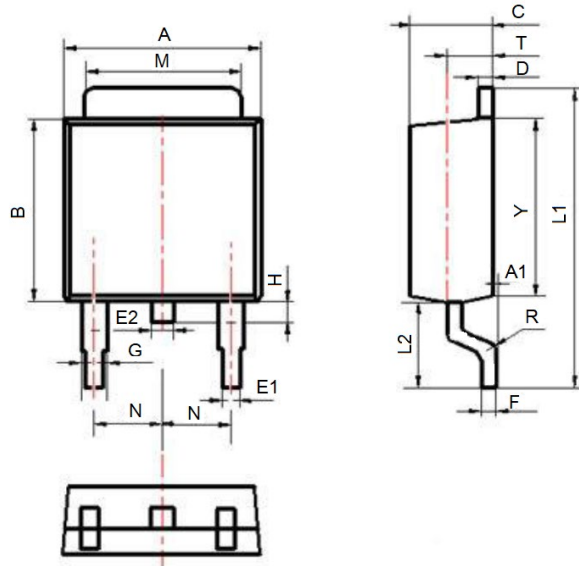
Dimension in TO-220 (Unit: mm)



Symbol	Min.	Max.
A	9.600	10.600
B	15.000	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



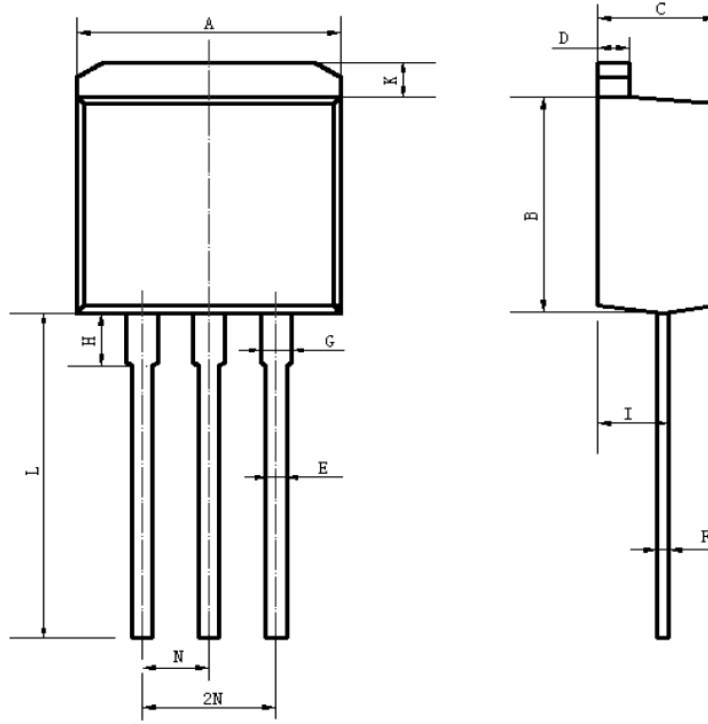
Dimension in TO-252 (Unit: mm)



Symbol	MILLIMETERS	
	Min.	Max.
A	6.300	6.900
A1	0.000	0.130
B	5.700	6.300
C	2.100	2.500
D	0.300	0.600
E1	0.600	0.900
E2	0.700	1.000
F	0.300	0.600
G	0.700	1.200
L1	9.600	10.500
L2	2.700	3.100
H	0.600	1.000
M	5.100	5.500
N	2.090	2.490
R	0.300	0.300
T	1.400	1.600
Y	5.100	6.300



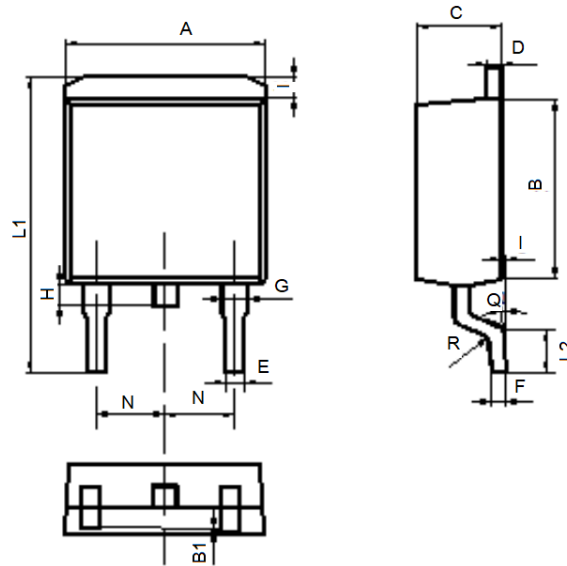
Dimension in TO-262-3 (Unit: mm)



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	Values(mm)	
	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	0.400	0.400
N	2.390	2.690



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