TGD N-Channel Enhancement Mode Power MOSFET

Description

The TGD75H35T uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in automotive applications and a wide variety of other applications.

General Features

● V_{DSS} =75V,I_D =350A

$R_{DS(ON)}$ < 2.2mΩ @ V_{GS}=10V （Typ：1.7 mΩ）

● Good stability and uniformity with high E_{AS}
● Special process technology for high ESD capability
● High density cell design for ultra low Rdson
● Fully characterized avalanche voltage and current
● Excellent package for good heat dissipation

Application

● Automotive applications
● Hard switched and high frequency circuits
● Uninterruptible power supply

(2) D
(1) G
(3) S
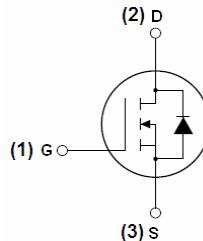
Schematic diagram
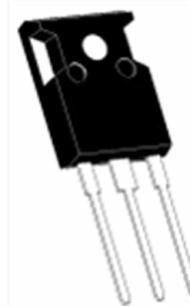
TO-247 top view

100% UIS TESTED!

100% ΔVds TESTED!

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
TGD75H35T	TGD75H35T	TO-247	-	-	-

Absolute Maximum Ratings (T$_C$=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DSS}	75	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	350	A
Drain Current-Continuous(T$_C$=100℃)	I_D (100℃)	270	A
Pulsed Drain Current	I_{DM}	1280	A
Maximum Power Dissipation	P_D	460	W
Derating factor		3.07	W/℃
Single pulse avalanche energy [Note 3]	E_{AS}	3500	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case [Note 1]	$R_{θJC}$	0.33	℃/W

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Electrical Characteristics (T_C=25℃ unless otherwise noted)

| Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250µA	75	86	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=75V,V_{GS}=0V	-	-	1	µA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±200	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250µA	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=40A	-	1.7	2.2	mΩ
Forward Transconductance	g_{FS}	V_{DS}=25V,I_D=40A	100	-	-	S
Dynamic Characteristics						
Input Capacitance	C_{Iss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	25500	-	PF
Output Capacitance	C_{oss}		-	1652	-	PF
Reverse Transfer Capacitance	C_{rss}		-	1261	-	PF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=40V,I_D=40A V_{GS}=10V,R_{GEN}=1.2Ω (Note2)	-	50	-	nS
Turn-on Rise Time	t_r		-	235	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	180	-	nS
Turn-Off Fall Time	t_f		-	280	-	nS
Total Gate Charge	Q_g	V_{DS}=40V,I_D=40A, V_{GS}=10V(Note2)	-	586	-	nC
Gate-Source Charge	Q_{gs}		-	120	-	nC
Gate-Drain Charge	Q_{gd}		-	200	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=40A	-	-	1.2	V
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF = 40A di/dt = 100A/µs(Note2)	-	170	-	nS
Reverse Recovery Charge	Qrr		-	500	-	nC

Notes:

1. Surface Mounted on FR4 Board, t ≤ 10 sec.

2. Pulse Test: Pulse Width ≤ 400µs, Duty Cycle ≤ 2%.

3. EAS condition：Tj=25℃,V_{DD}=37.5V,V_G=10V,L=1mH,Rg=25Ω

4. I_{SD}≤125A, di/dt≤260A/µs, V_{DD}≤$V_{(BR)DSS}$，TJ ≤175°C

Test circuit

1）E_{AS} **test Circuit**
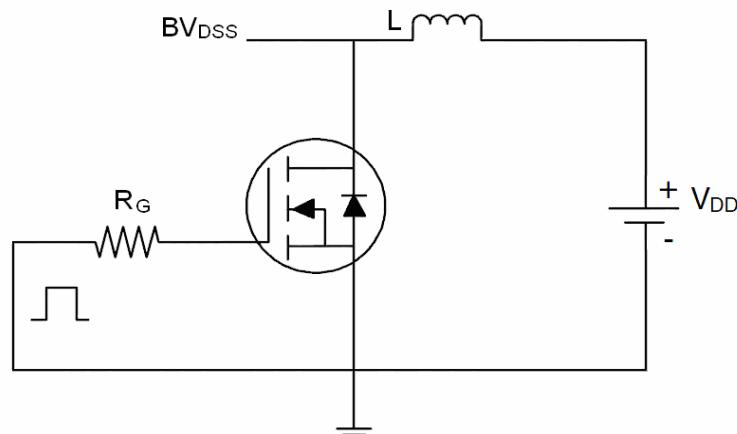
2）**Gate charge test Circuit**
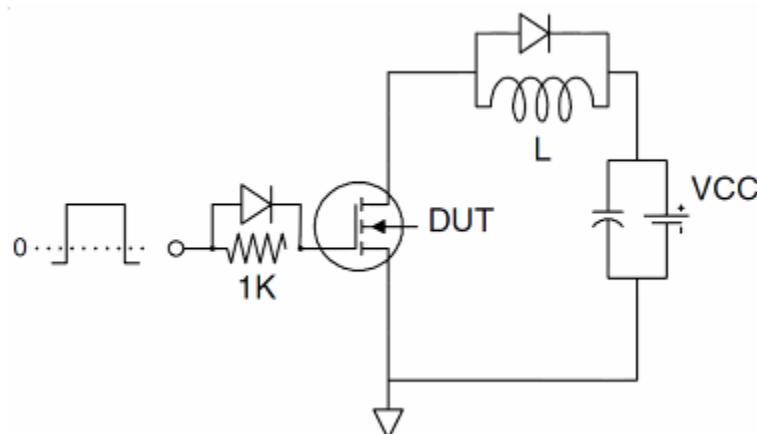
3）**Switch Time Test Circuit**

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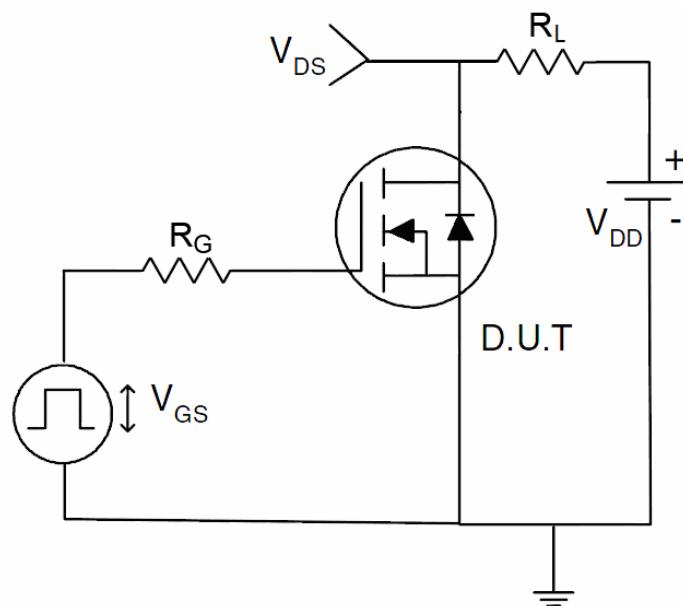
Typical Electrical and Thermal Characteristics
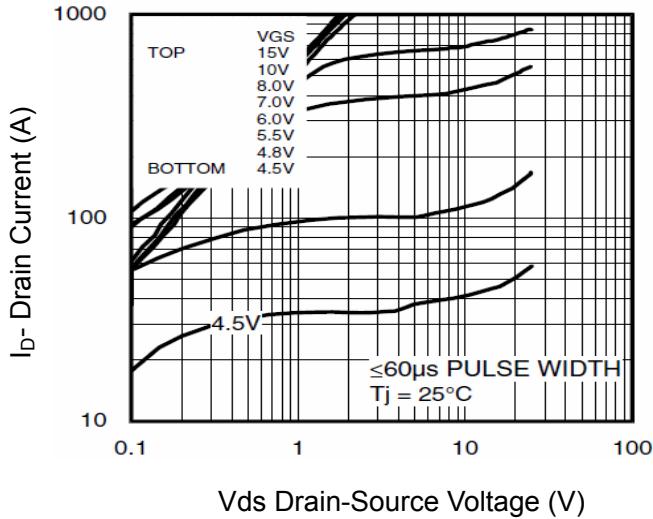
Figure 1 Output Characteristics
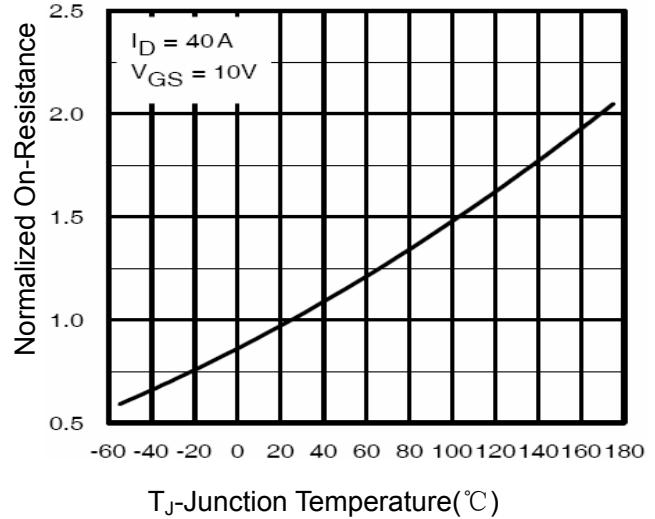
Figure 4 Rdson-JunctionTemperature
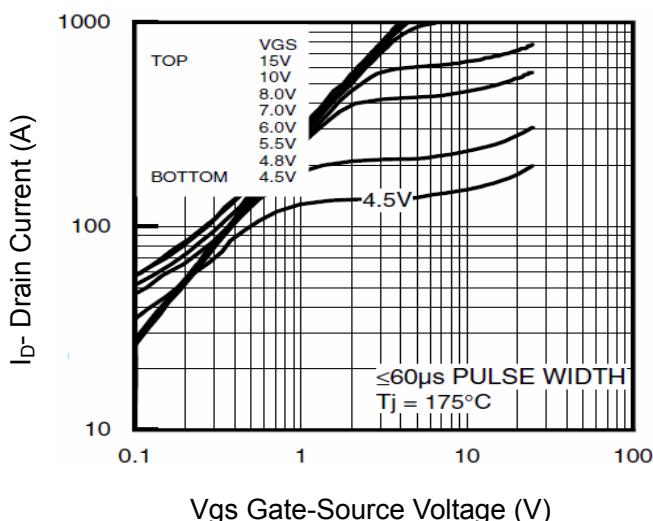
Figure 2 Transfer Characteristics
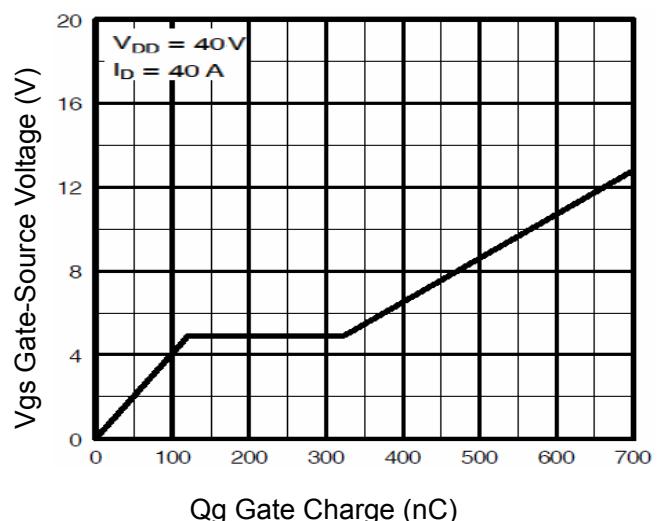
Figure 5 Gate Charge
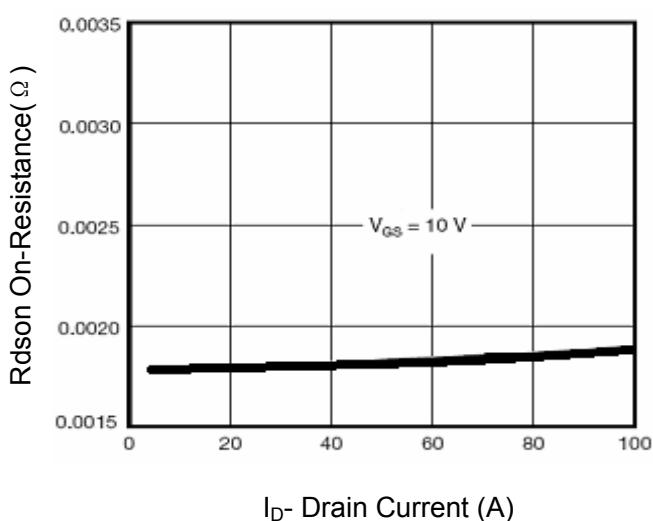
Figure 3 Rdson- Drain Current
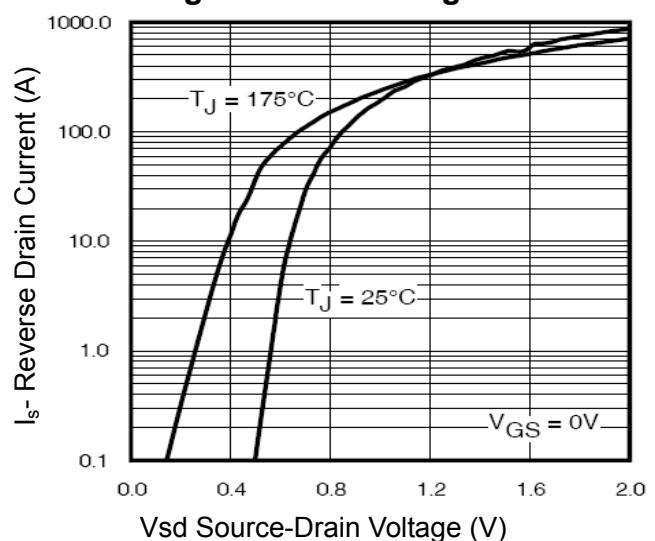
Figure 6 Source- Drain Diode Forward
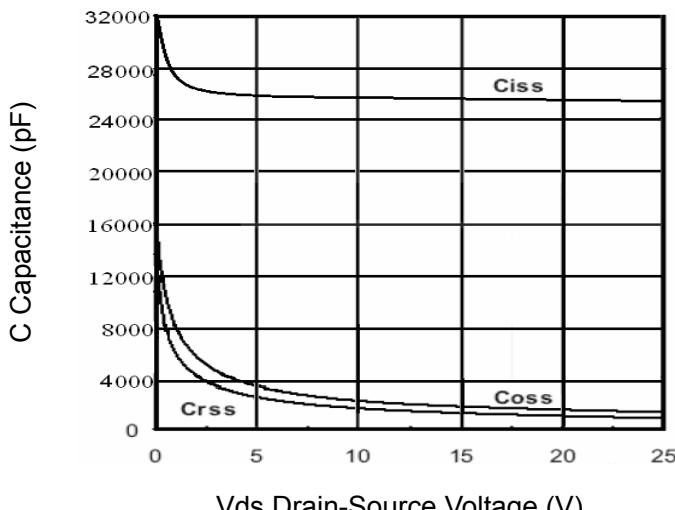
Vds Drain-Source Voltage (V)
**Figure 7 Capacitance vs Vds**
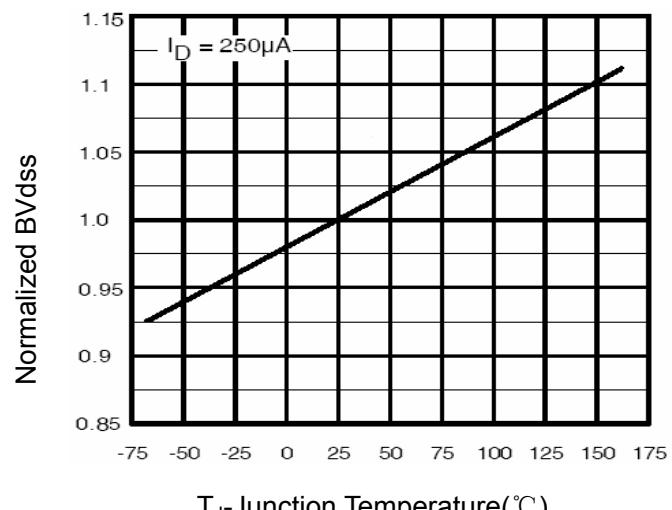
T_J-Junction Temperature($^{\circ}C$)
Figure 9 BV$_{DSS}$ vs Junction Temperature
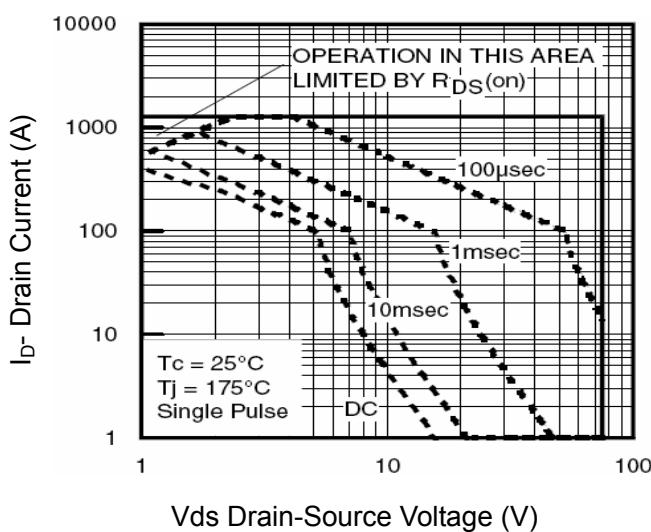
Vds Drain-Source Voltage (V)
**Figure 8 Safe Operation Area**
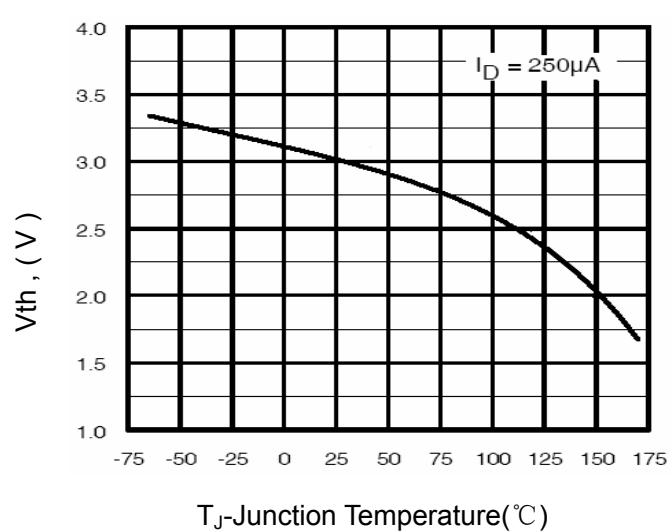
T_J-Junction Temperature($^{\circ}C$)
Figure 10 V$_{GS(th)}$ vs Junction Temperature
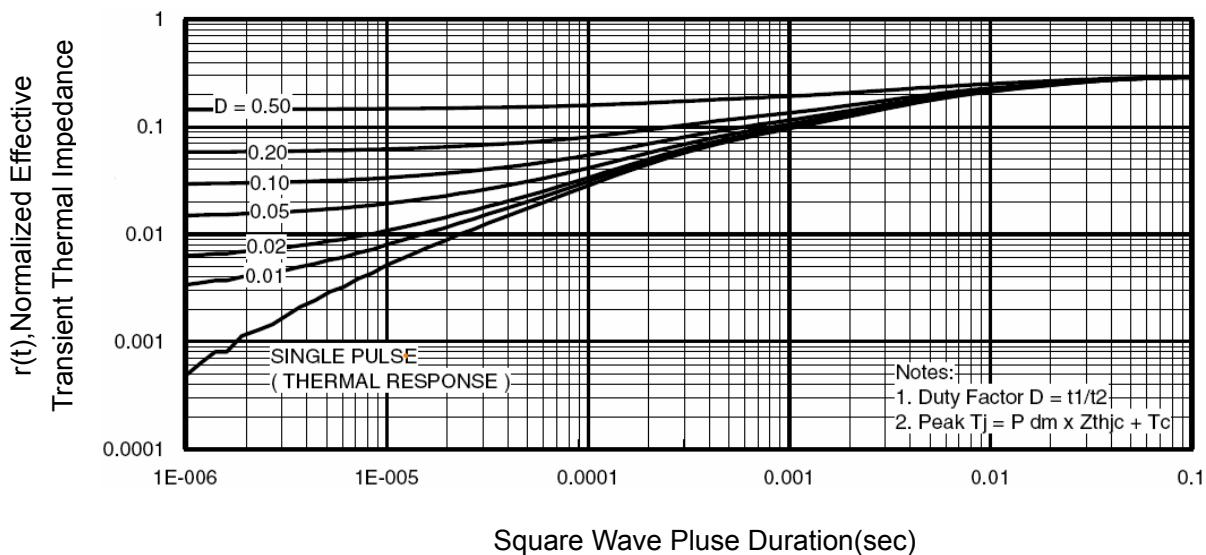
Square Wave Pluse Duration(sec)
Figure 11 Normalized Maximum Transient Thermal Impedance

TO-247 Package Information
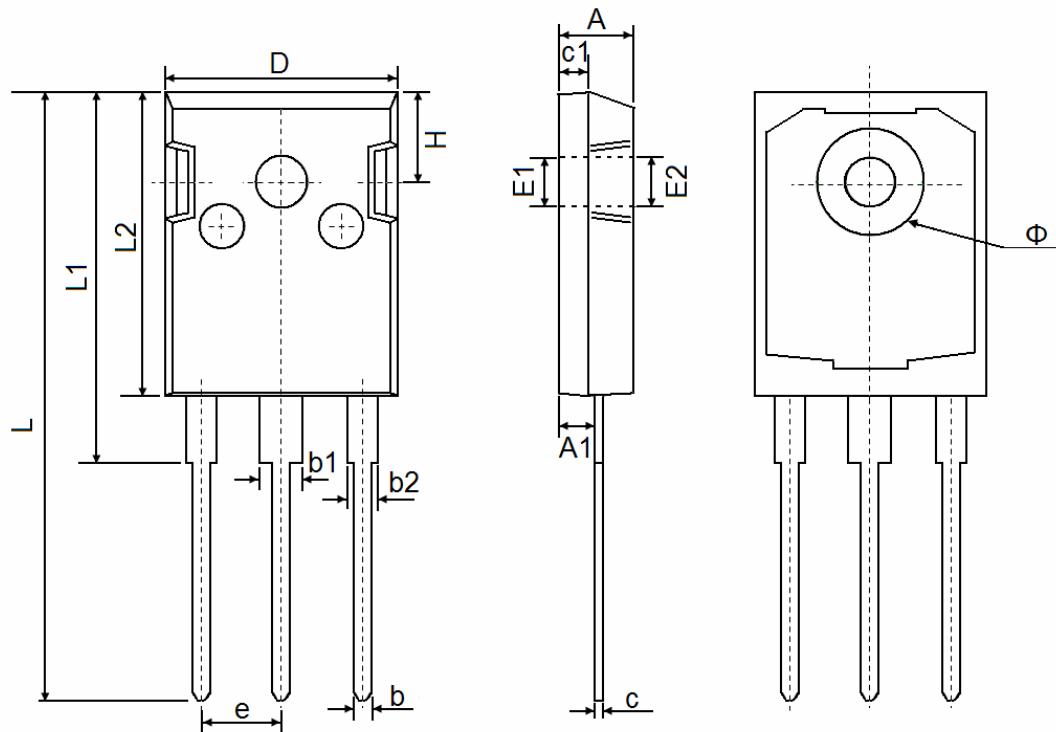
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	

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