N-Channel Enhancement Mode Power MOSFET

Description

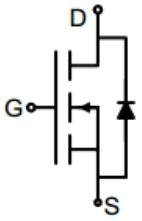
The GT045N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

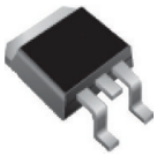
- V_{DS} 100V
- I_D (at V_{GS} = 10V) 130A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 4.5mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 6.3mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters
- BMS



Schematic Diagram



TO-263

Device	Package	Marking	Packaging
GT045N10M	TO-263	GT045N10	800pcs/Reel
GT045N10T	TO-220	GT045N10	50pcs/Tube

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Continuous Drain Current		I_D	130	A
Pulsed Drain Current	(note1)	I_{DM}	240	A
Gate-Source Voltage		V_{GS}	±20	V
Single Pulse Avalanche Energy	(note2)	EAS	42	mJ
Power Dissipation		P_D	156	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	ºC/W
Thermal Resistance, Junction-to-Case	R_{thJc}	0.8	ºC/W

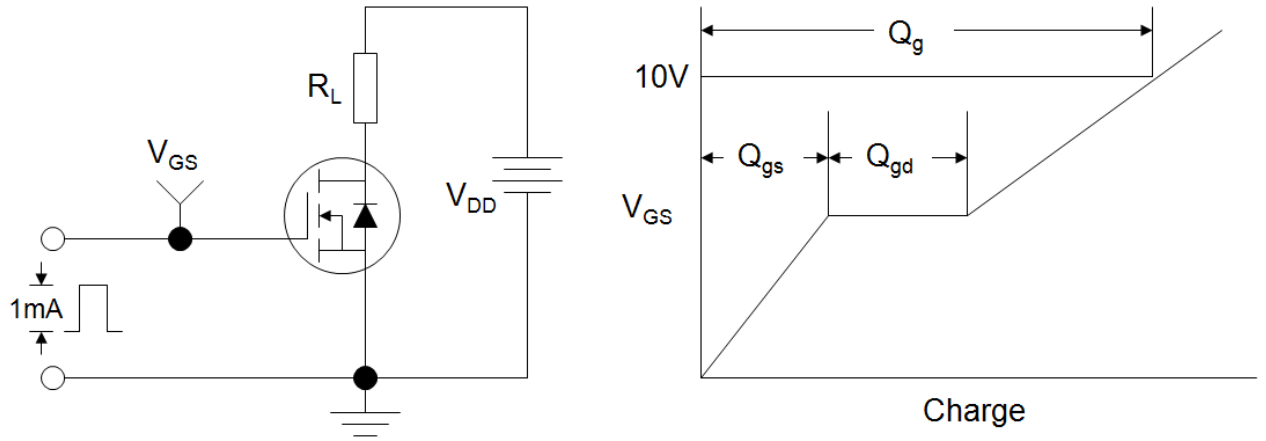
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	2	3	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A	--	4.1	4.5	mΩ
		V_{GS} = 4.5V, I_D = 20A	--	6.0	6.3	
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=20A	--	60	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	6124	--	pF
Output Capacitance	C_{oss}		--	792	--	
Reverse Transfer Capacitance	C_{rss}		--	15	--	
Total Gate Charge	Q_g	V_{DD} = 50V, I_D = 20A, V_{GS} = 10V	--	101.6	--	nC
Gate-Source Charge	Q_{gs}		--	20.6	--	
Gate-Drain Charge	Q_{gd}		--	28.7	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 20A, R_G = 4.5Ω	--	28.2	--	ns
Turn-on Rise Time	t_r		--	7.5	--	
Turn-off Delay Time	$t_{d(off)}$		--	81.9	--	
Turn-off Fall Time	t_f		--	20.1	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	130	A
Pulsed Diode Forward Current	I_{SM}		--	--	390	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 20A, V_{GS} = 0V	--	--	1.3	V

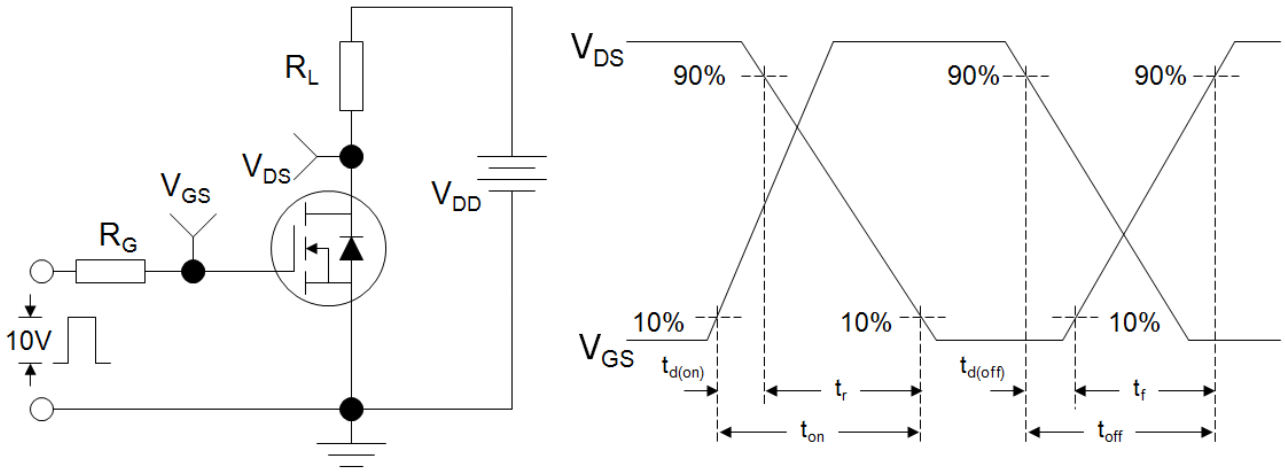
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 23A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
3. Identical low side and high side switch with identical R_G

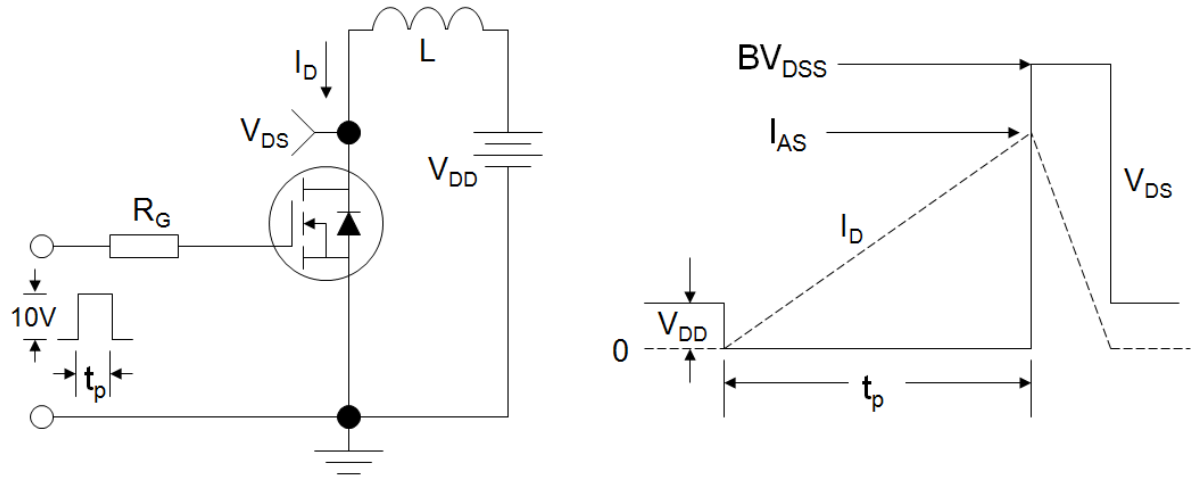
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

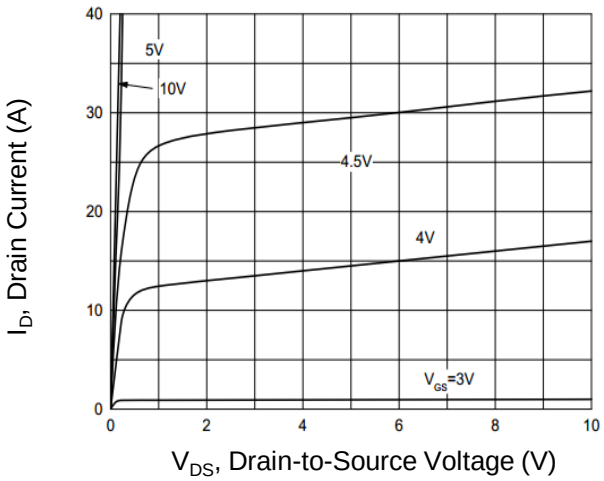


Figure 2. Transfer Characteristics

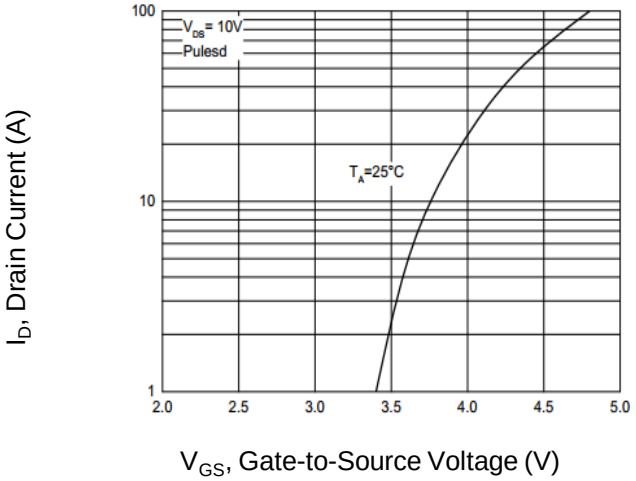


Figure 3.Rdson-Drain Current

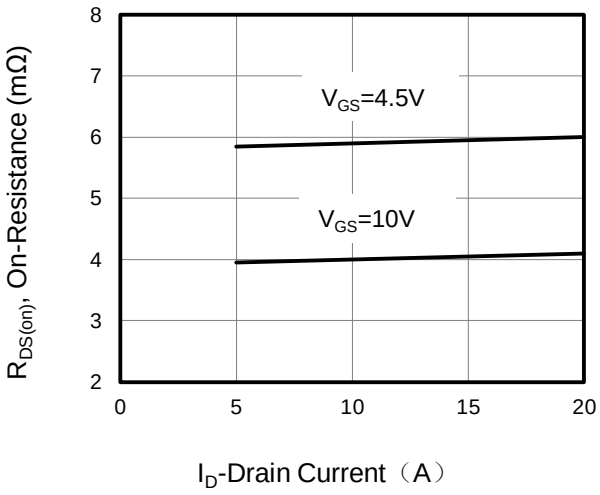


Figure 4. Gate Charge

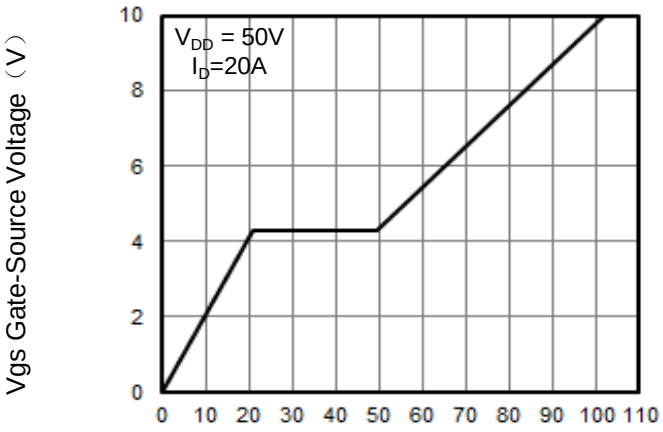


Figure 5. Capacitance vs Vds

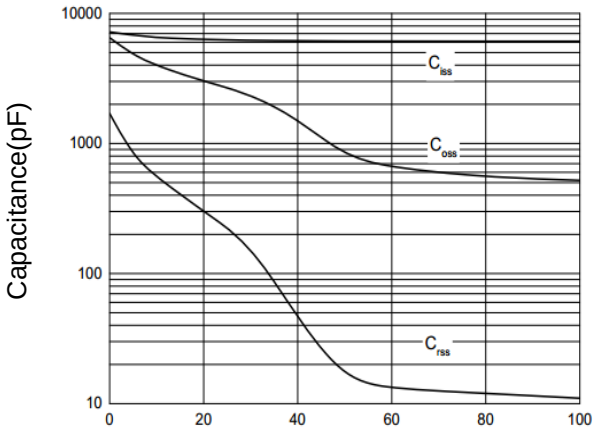
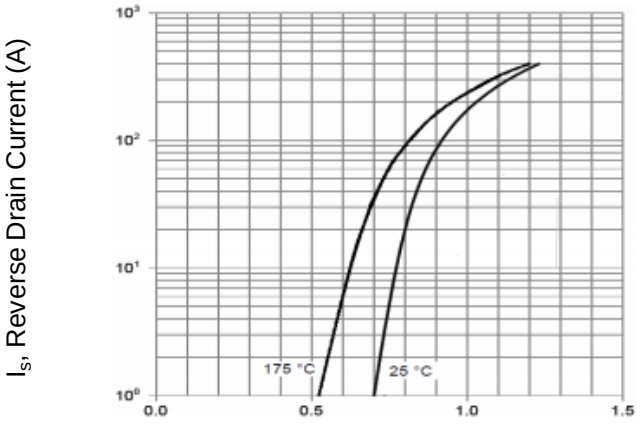


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

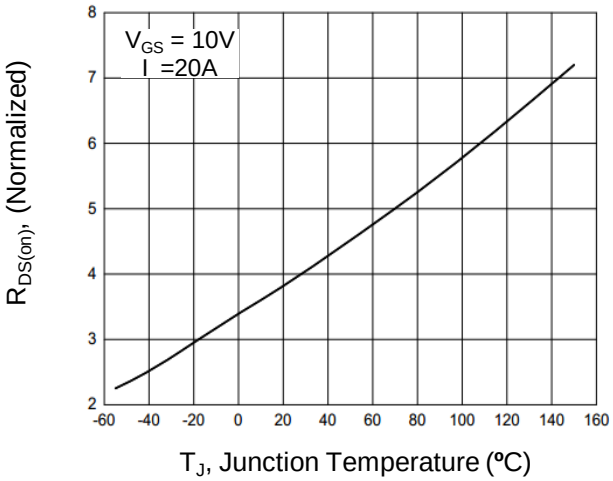


Figure 8. Safe Operation Area

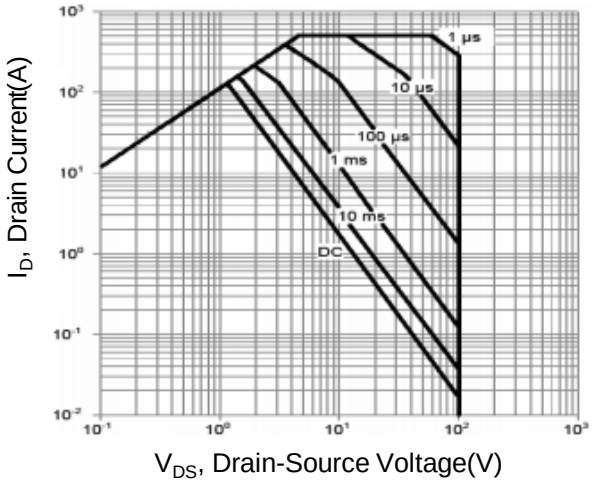
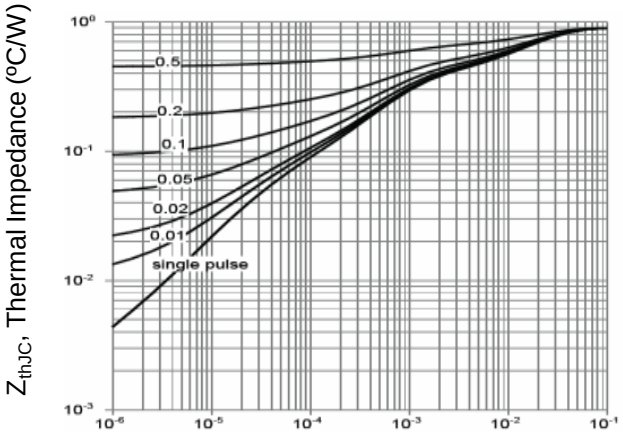
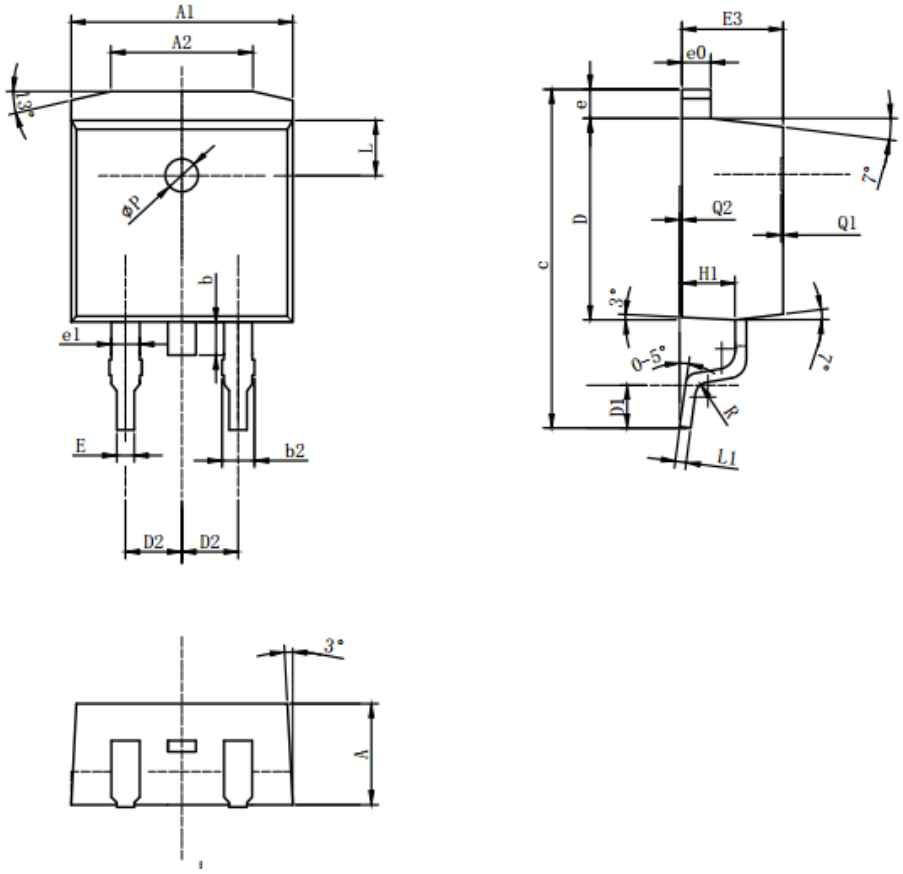


Figure 9. Normalized Maximum Transient Thermal Impedance



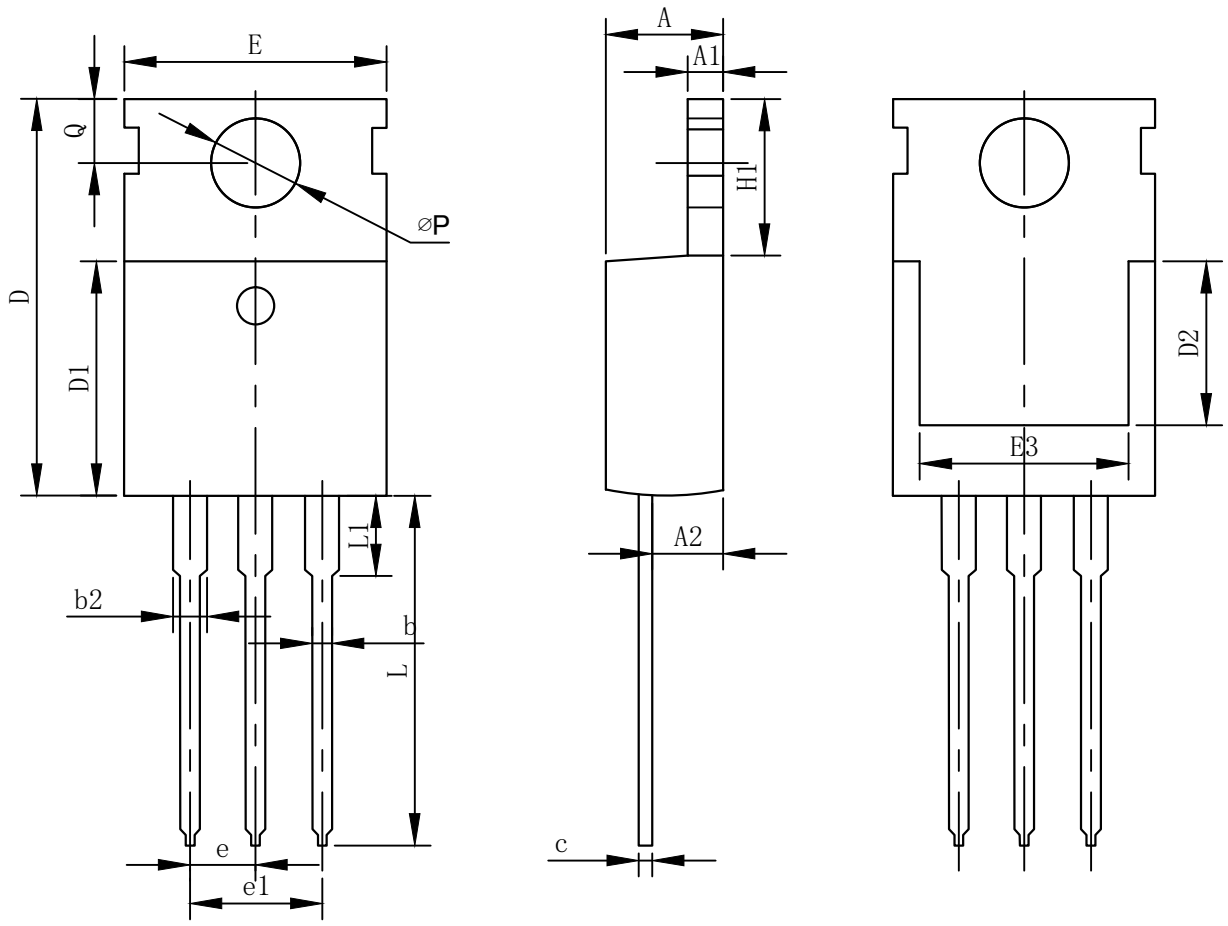
TO-263 Package Information



COMMON DIMENSIONS

SYMBO	mm		
	MIN	NOM	MAX
A	4.52	4.57	4.62
A1	9.95	10.00	10.05
A2	6.30	6.40	6.50
b	1.30	1.50	1.70
b2	1.17	1.27	1.37
c	14.80	15.00	15.20
D	9.05	9.10	9.15
D1	1.90	2.10	2.30
D2	–	2.54	–
E	–	0.80	–
E3	–	4.57	–
e	–	1.30	–
e0	–	1.30	–
e1	1.73	3	–
H1	–	2.40	–
L	–	2.50	–
L1	–	0.50	–
ΦP	–	1.50	–
R	–	0.50	–
Q1	0.10	–	0.15
Q2	0	–	0.02

TO-220 Package information



COMMONDIMENSIONS

SYMBO	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.70
A1	1.25	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.70	1.27	1.47
c	0.45	0.50	0.60
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50	-	-
E	9.70	10.00	10.30
E3	7.00	-	-
e	2.54BSC		
e1	5.08BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1	-	3.10	3.40
ϕP	3.40	3.60	3.80
Q	2.60	2.80	3.00

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