Wuxi Unigroup Microelectronics CO.,LTD.

80V N-Channel Trench MOSFET

Features

- Trench Power Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for Fast-switching Applications

Applications

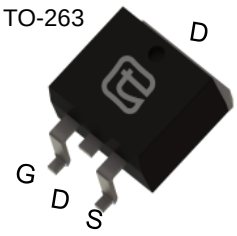
- Synchronous Rectification in DC/DC and AC/DC Converters
- Isolated DC/DC Converters in Telecom and Industrial

Product Summary

V_{DS}	80V
$R_{DS(ON)}$ (at V_{GS}=10V)	< 4.5mΩ
I_D (at V_{GS}=10V)	160A
100% UIS Tested	

RoHS

TO-263



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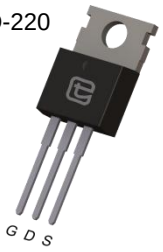
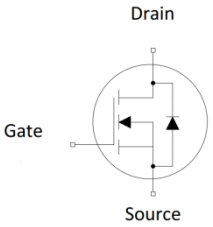




Device	Package	Marking
TMB160N08A	TO-263	160N08A
TMP160N08A	TO-220	160N08A

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage (V_{GS} = 0V)		V_{DSS}	80	V
Continuous Drain Current	T_C = 25ºC	I_D	160	A
	T_C = 100ºC		112	
Pulsed Drain Current (note1)		I_{DM}	640	A
Gate-Source Voltage		V_{GSS}	±20	V
Single Pulse Avalanche Energy (note2)		E_{AS}	960	mJ
Avalanche Current		I_{As}	80	A
Power Dissipation (note3)	T_C = 25ºC	P_D	283	W
	T_C = 100ºC		141	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+175	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	0.53	ºC/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	

Specifications T_J = 25ºC, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	80	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
		V_{DS} = 80V, V_{GS} = 0V, T_J = 100ºC	--	--	25	
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	--	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A	--	3.7	4.5	mΩ
Forward Transconductance	g_{fs}	V_{DS} = 5V, I_D = 20A	60	--	--	S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 40V, f = 1.0MHz	--	9000	--	pF
Output Capacitance	C_{oss}		--	520	--	
Reverse Transfer Capacitance	C_{rss}		--	350	--	
Total Gate Charge	Q_g	V_{DD} = 40V, I_D = 20A, V_{GS} = 10V	--	180	--	nC
Gate-Source Charge	Q_{gs}		--	32	--	
Gate-Drain Charge	Q_{gd}		--	66	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 40V, I_D = 2A, R_G = 2.5Ω	--	38	--	ns
Turn-on Rise Time	t_r		--	40	--	
Turn-off Delay Time	$t_{d(off)}$		--	56	--	
Turn-off Fall Time	t_f		--	21	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	160	A
Pulsed Diode Forward Current	I_{SM}		--	--	640	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 20A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Time	t_{rr}	I_F = 20A, di_F/dt = 500A/μs	--	62	--	ns
Reverse Recovery Charge	Q_{rr}		--	74	--	nC

Notes

1. Repetitive Rating: Pulse Width limited by maximum junction temperature
2. I_{AS} = 80A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
3. The power dissipation PD is based on TJ(MAX)=175° C, using junction-to-case thermal resistance.

Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

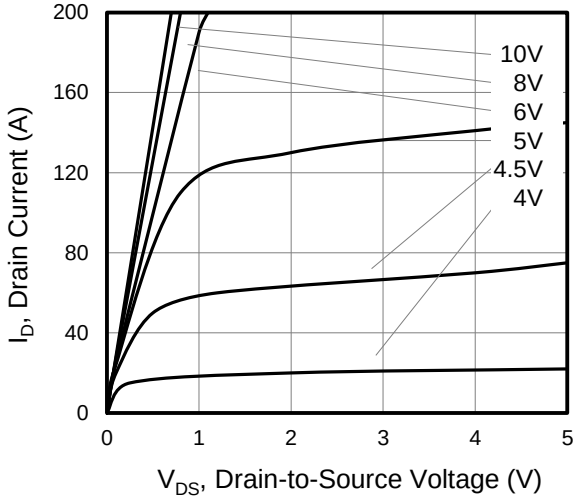


Figure 2. Transfer Characteristics

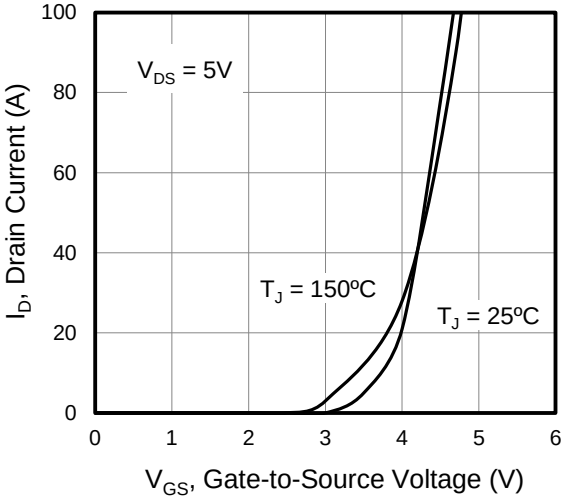


Figure 3. On-Resistance vs. Drain Current

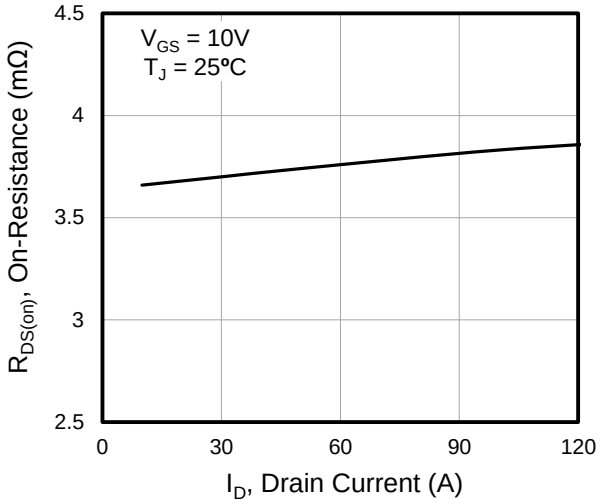


Figure 4. Capacitance

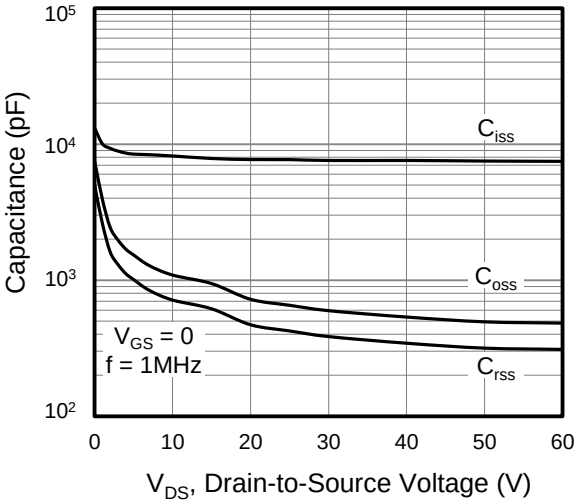


Figure 5. Gate Charge

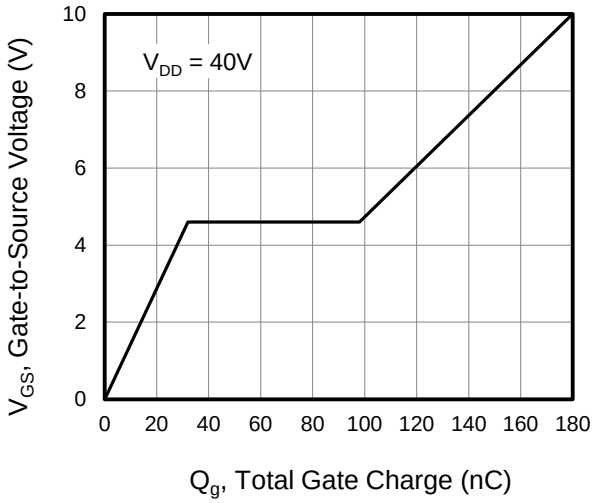
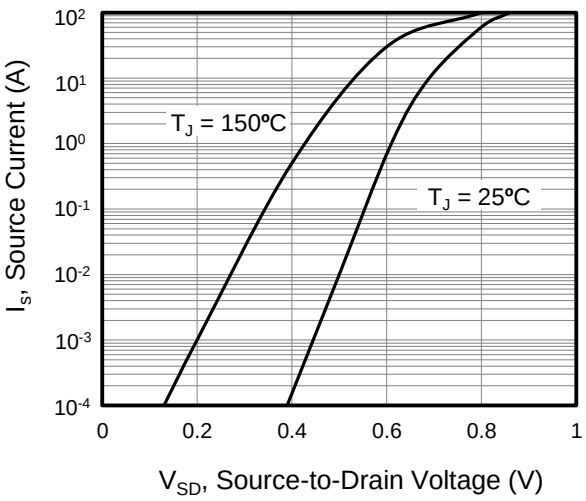


Figure 6. Body Diode Forward Voltage



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. On-Resistance vs. Junction Temperature

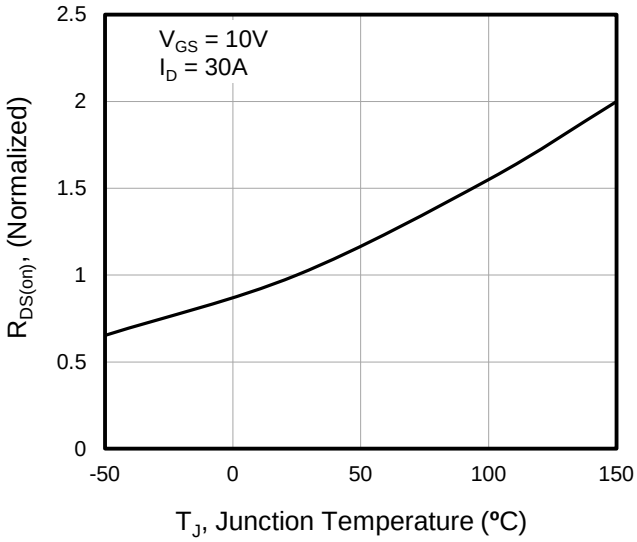


Figure 8. Threshold Voltage vs. Junction Temperature

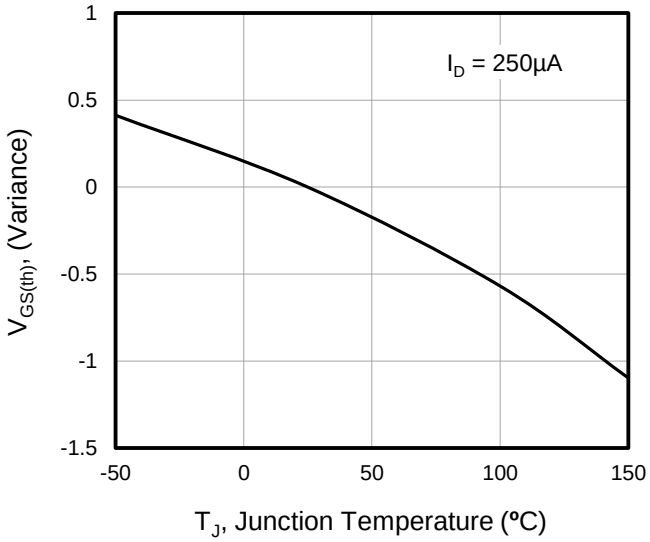


Figure 9. Transient Thermal Impedance

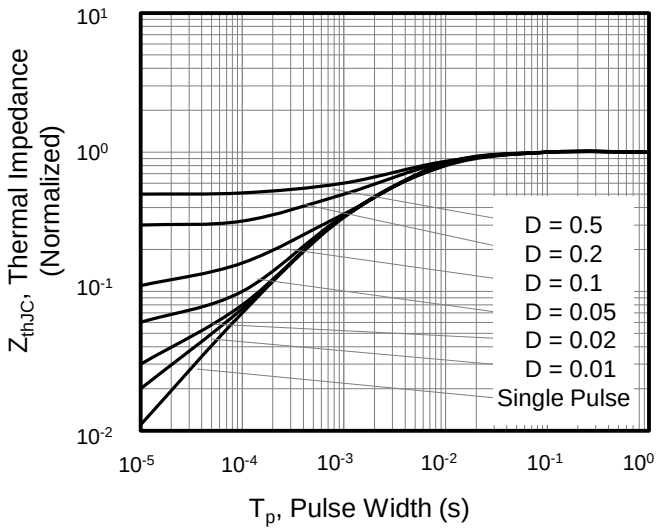


Figure 10. Safe operation area for

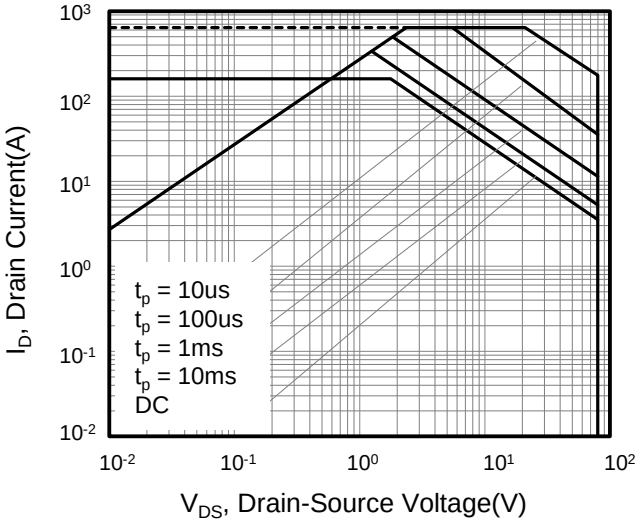


Figure A：Gate Charge Test Circuit and Waveform

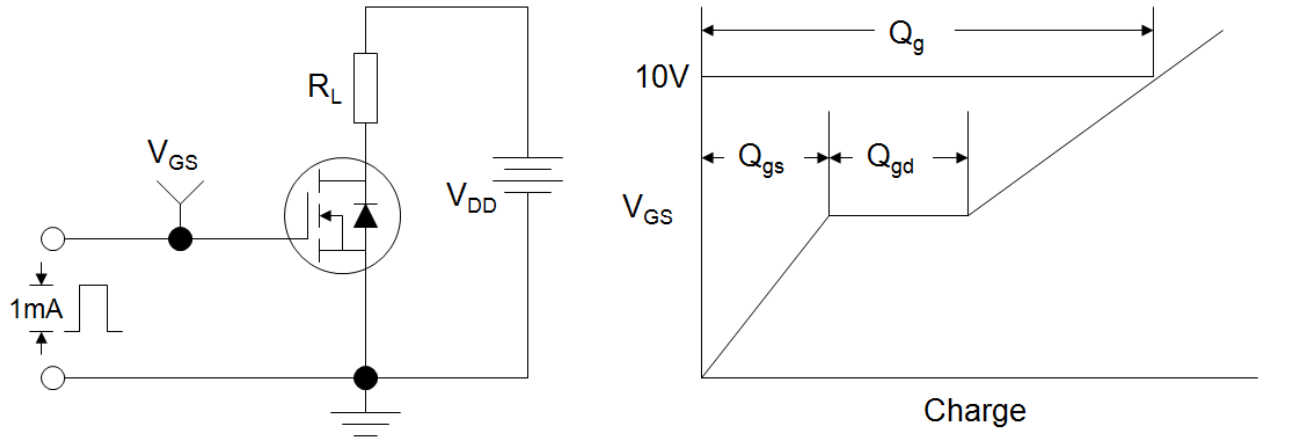


Figure B：Resistive Switching Test Circuit and Waveform

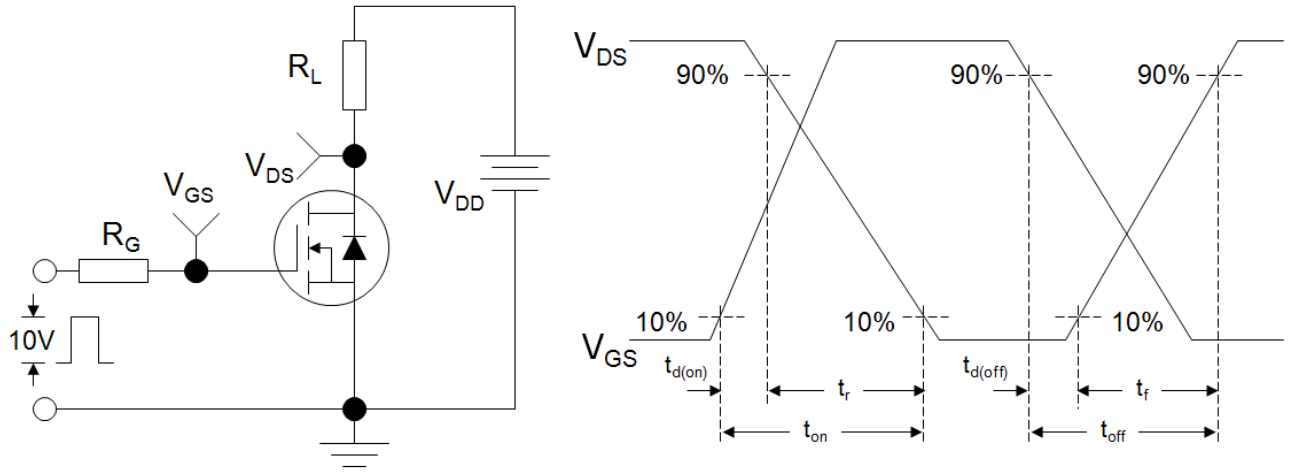
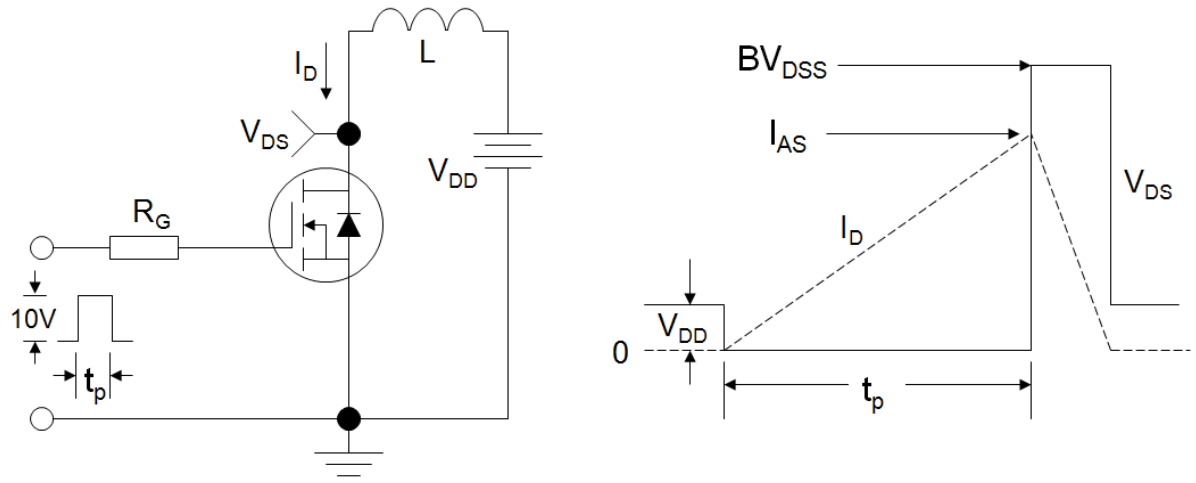


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



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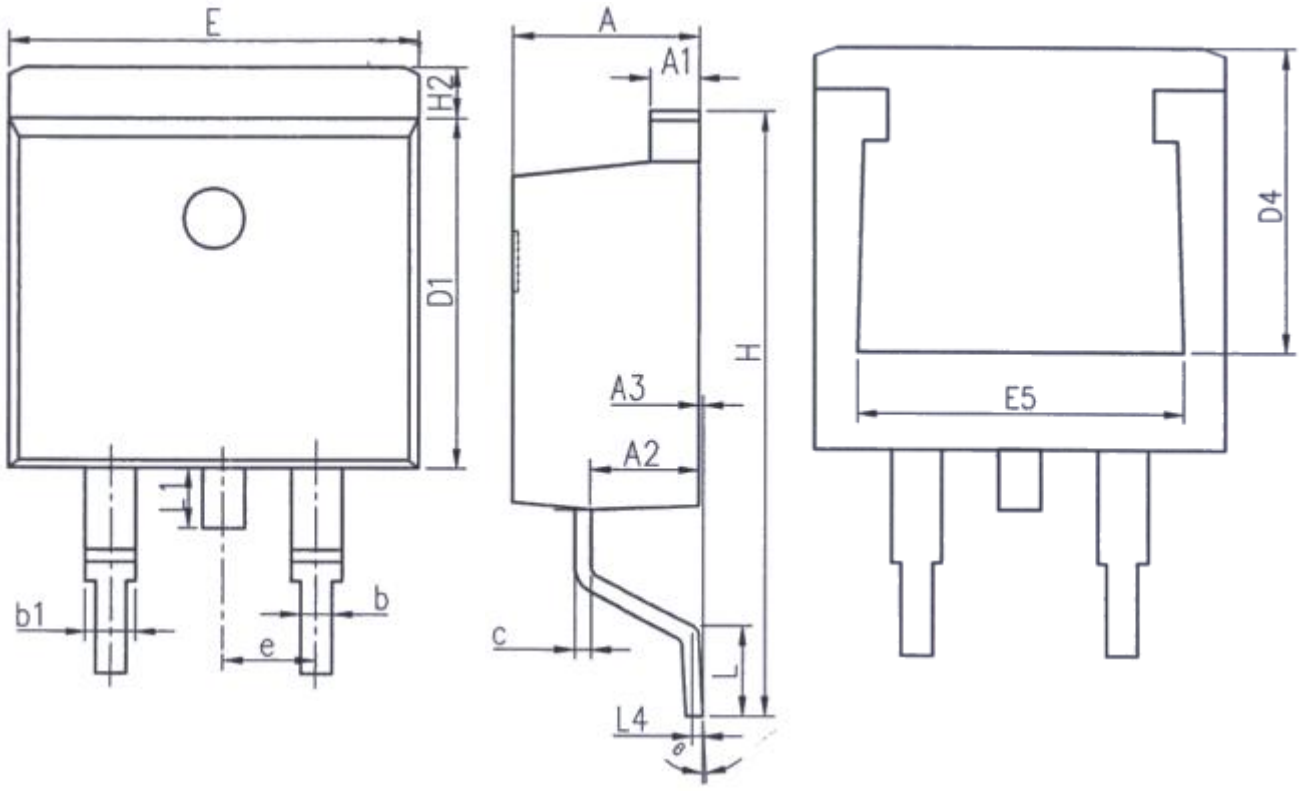

Unit: mm		
Symbol	Min.	Max.
A	4.37	4.77
A1	1.22	1.42
A2	2.49	2.89
A3	0.00	0.25
b	0.70	0.96
b1	1.17	1.47
c	0.30	0.53
D1	8.50	8.90
D4	6.60	-

Unit: mm		
Symbol	Min.	Max.
E	9.86	10.36
E5	7.06	-
e	2.54BSC	
H	14.70	15.50
H2	1.07	1.47
L	2.00	2.60
L1	1.40	1.70
L4	0.25BSC	
θ	0°	9°

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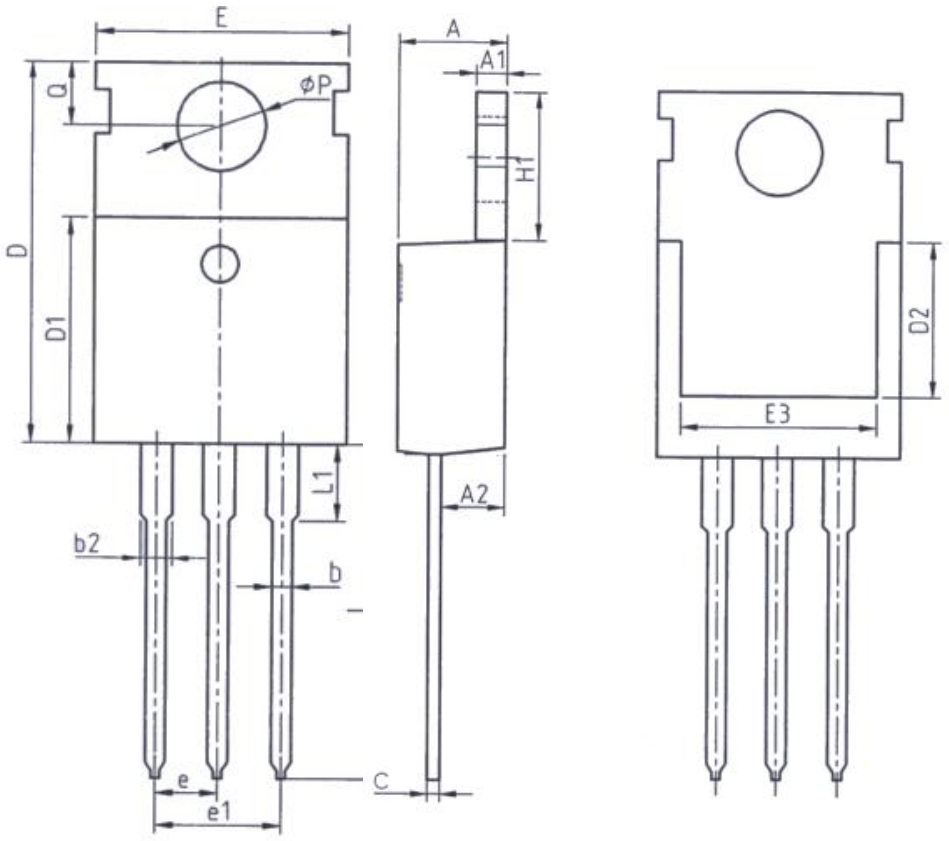

Unit: mm		
Symbol	Min.	Max.
A	4.37	4.77
A1	1.25	1.45
A2	2.20	2.60
b	0.70	0.95
b2	1.17	1.47
c	0.40	0.65
D	15.10	16.10
D1	8.80	9.40
D2	5.50	–

Unit: mm		
Symbol	Min.	Max.
E	9.70	10.30
E3	7.00	–
e	2.54BSC	
e1	5.08BSC	
H1	6.25	6.85
L	12.75	13.80
L1	–	3.40
P	3.40	3.80
Q	2.60	3.00

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