N-Channel Enhancement Mode Power MOSFET

Description

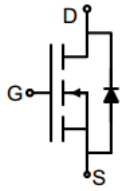
The GT080N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

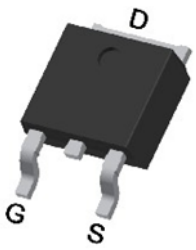
- V_{DS} 100V
- I_D (at V_{GS} = 10V) 75A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 8mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 12mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Synchronous Rectification in SMPS or LED Driver
- UPS
- Motor Control
- BMS
- High Frequency Circuit



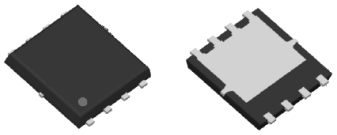
Schematic Diagram



TO-252



TO-220


DFN5*6

Device	Package	Marking	Packaging
GT080N10T	TO-220	GT080N10	50pcs/Tube
GT080N10M	TO-263	GT080N10	50pcs/Tube
GT080N10D5	DFN5*6	GT080N10	2500pcs/Reel

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	75	A
Pulsed Drain Current (note1)	I_{DM}	300	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_D	100	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-Case	R_{thJC}	1.5	ºC/W

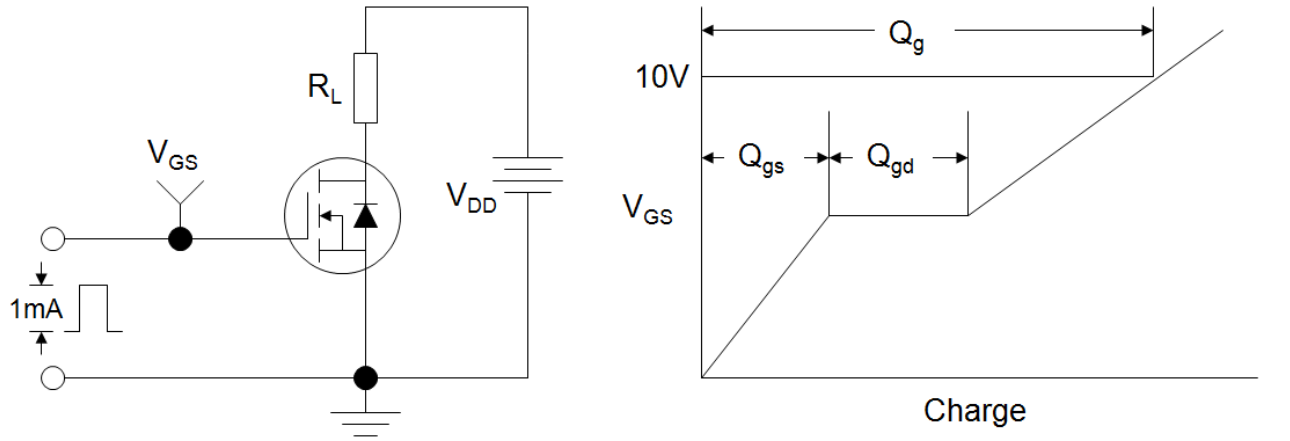
Specifications T_J = 25ºC, unless otherwise noted

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	2.2	3	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 50A	--	6	8	mΩ
		V_{GS} = 4.5V, I_D = 50A		10	12	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=50A	--	60	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	3650	--	pF
Output Capacitance	C_{oss}		--	315	--	
Reverse Transfer Capacitance	C_{rss}		--	22	--	
Total Gate Charge	Q_g	V_{DD} = 50V, I_D = 40A, V_{GS} = 10V	--	70	--	nC
Gate-Source Charge	Q_{gs}		--	14.5	--	
Gate-Drain Charge	Q_{gd}		--	17	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 40A, R_G = 1.6Ω	--	16	--	ns
Turn-on Rise Time	t_r		--	11	--	
Turn-off Delay Time	$t_{d(off)}$		--	35	--	
Turn-off Fall Time	t_f		--	9	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	75	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 25A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Time	trr	I_S = 40A, V_{GS} = 0V di/dt=100A/us	--	60	--	nS

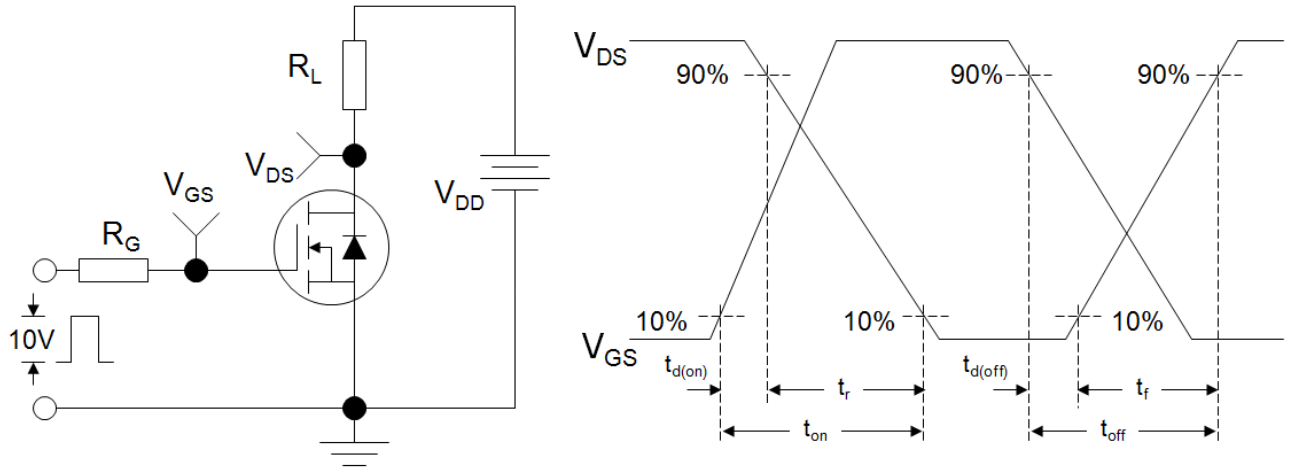
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 20A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
3. Identical low side and high side switch with identical R_G

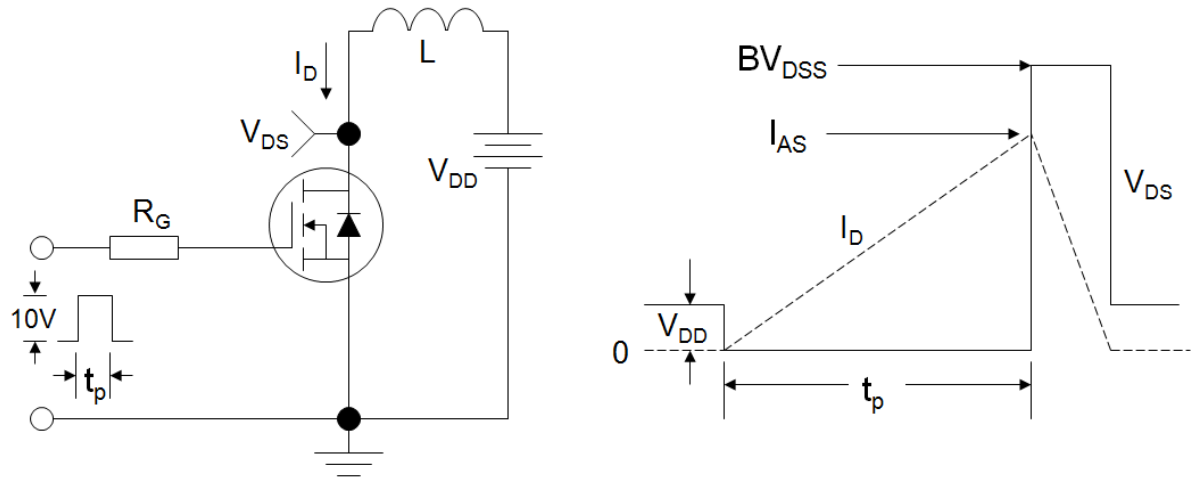
Gate Charge Test Circuit



EAS Test Circuit

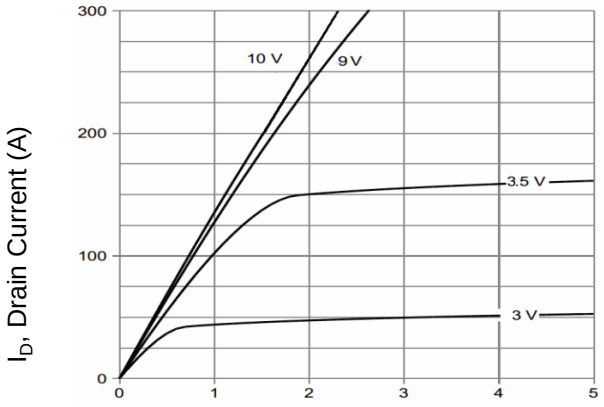


Switch Time Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

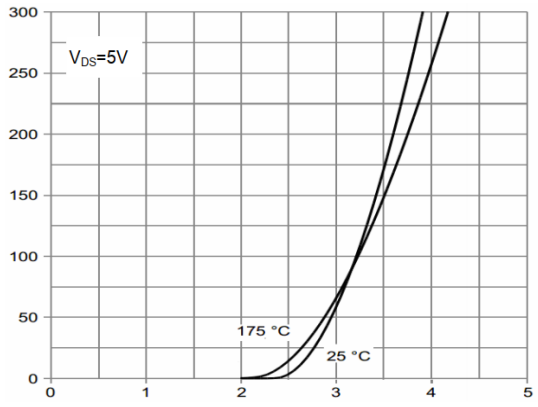
Figure 1. Output Characteristics



I_D, Drain Current (A)

V_{DS}, Drain-to-Source Voltage (V)

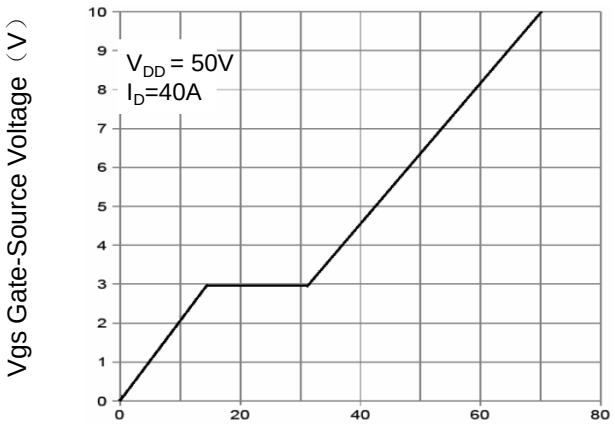
Figure 2. Transfer Characteristics



I_D, Drain Current (A)

V_{GS}, Gate-to-Source Voltage (V)

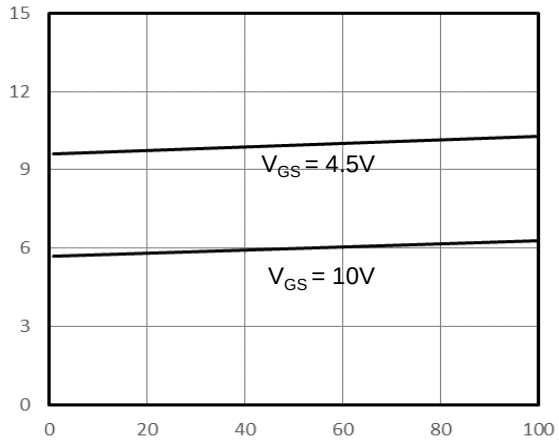
Figure 3. Gate Charge



Vgs Gate-Source Voltage（V）

Qg Gate Charge（nC）

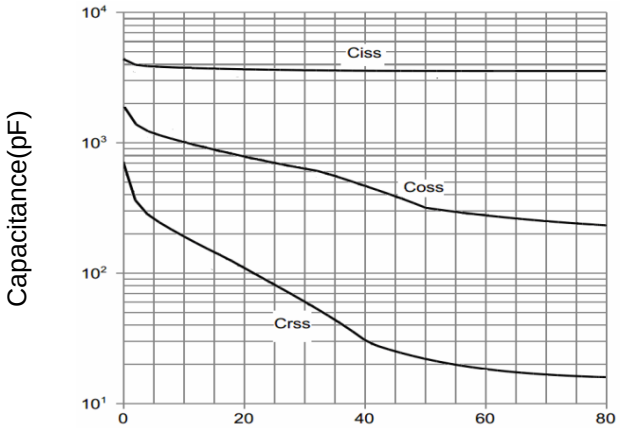
Figure 4. Drain Source On Resistance



RDS(on),On-Resistance（mΩ）

ID-Drain Current（A）

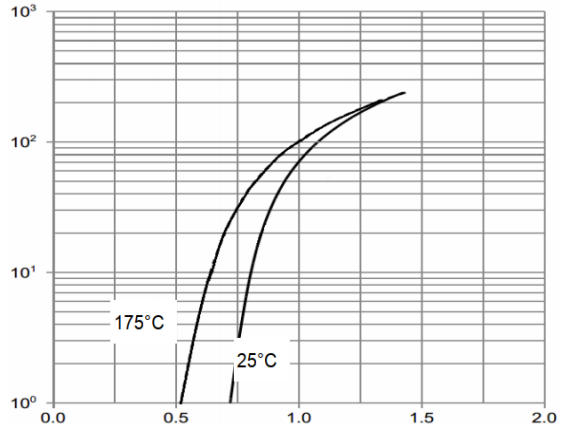
Figure 5. Capacitance vs Vds



Capacitance(pF)

Vds Drain-Source Voltage(V)

Figure 6. Source-Drain Diode Forward



I_s, Reverse Drain Current (A)

V_{SD}, Source-to-Drain Voltage (V)

Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

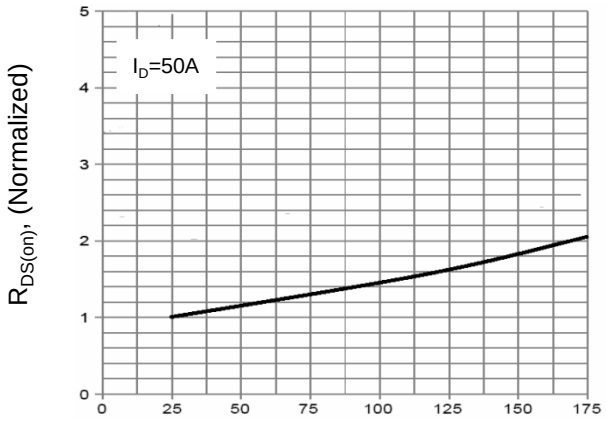


Figure 8. Safe Operation Area

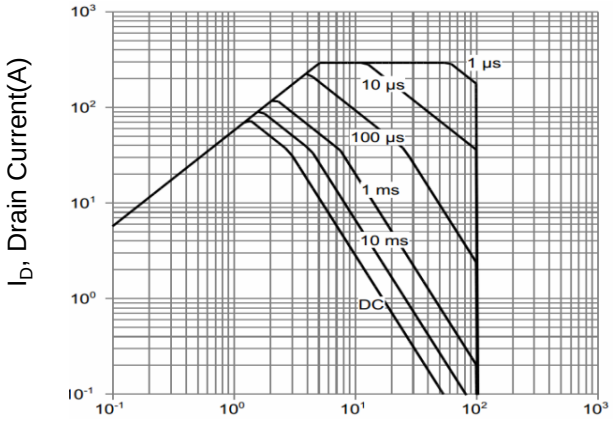
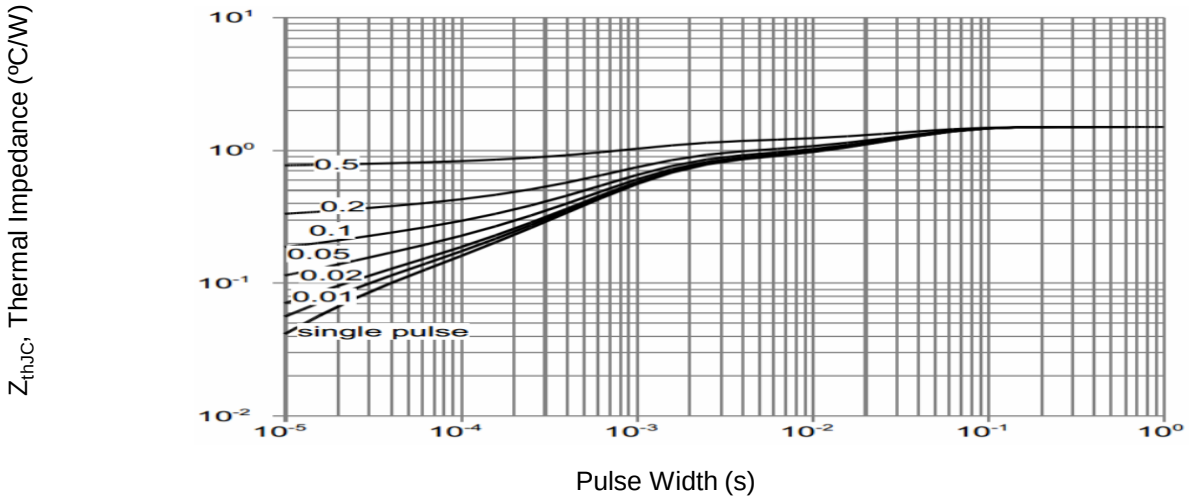
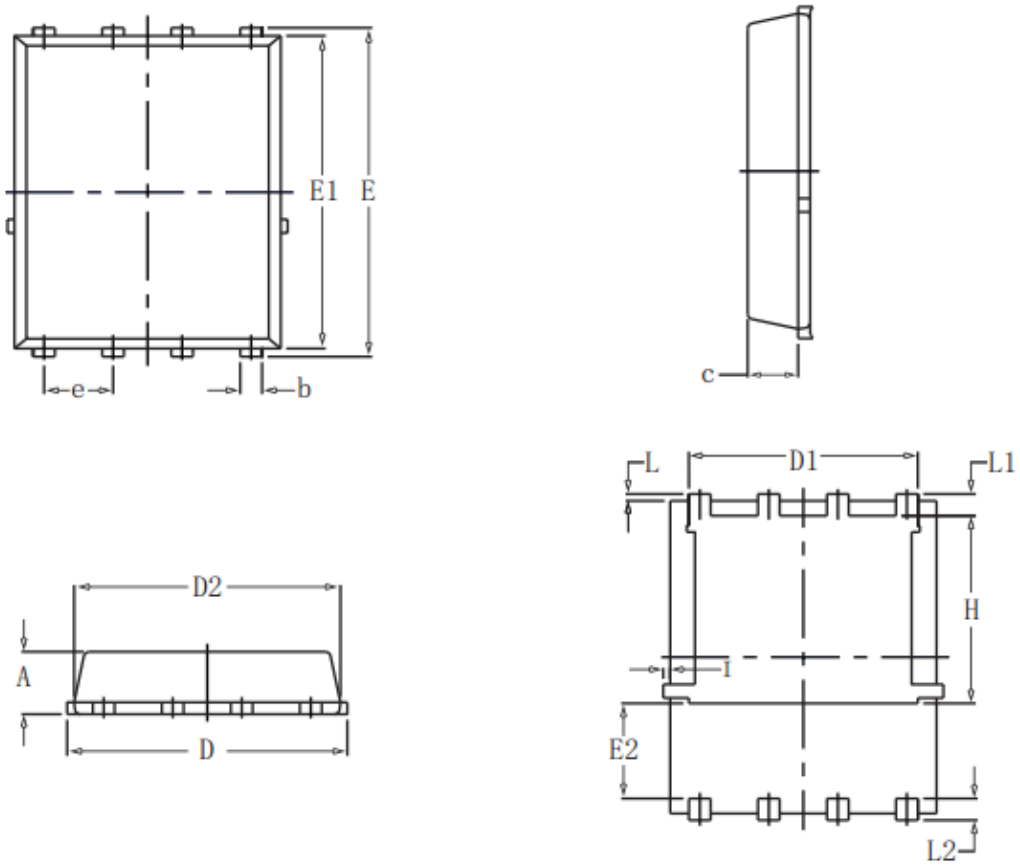


Figure 9. Normalized Maximum Transient Thermal Impedance

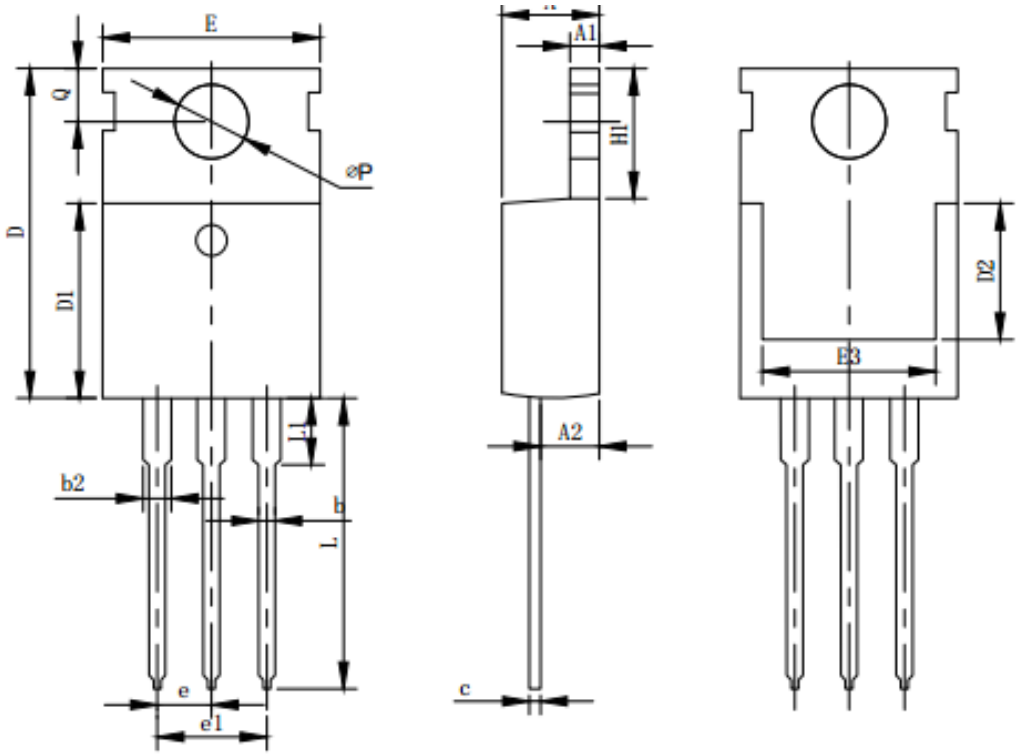


DFN5×6-8L Package Information



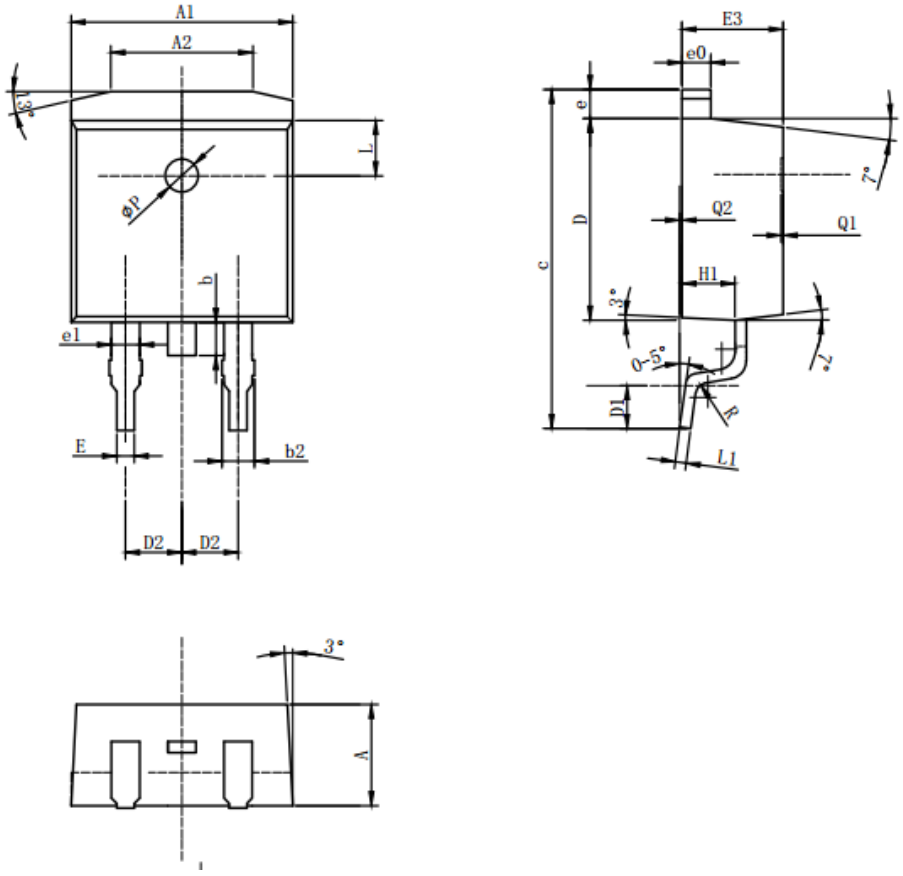
SYMBOL	COMMON			
	MM		INCH	
	MIN	MAX	MIN	MAX
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.59	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	-	0.0630	-
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	-	0.18	-	0.0070

TO-220 Package Information



Symbol	Dimensions in Millimeters		
	MIN.	NOM.	MAX.
A	4.37	4.57	4.7
A1	1.25	1.3	1.4
A2	2.2	2.4	2.6
b	0.7	0.8	0.95
b2	1.7	1.27	1.47
c	0.45	0.5	0.6
D	15.1	15.6	16.1
D1	8.8	9.1	9.4
D2	5.5		
E	9.7	10	10.3
e	2.54BSC		
e1	5.08BSC		
H1	6.25	6.5	6.85
L	12.75	13.5	13.8
L1		3.1	3.4
ØP	3.4	3.6	3.8
Q	2.6	2.8	3

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

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