N-Channel Enhancement Mode Power MOSFET

Description

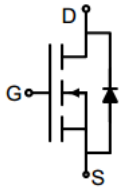
The GT060N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

- V_{DS} 100V
- I_D (at V_{GS} = 10V) 120A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 5.2mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 7mΩ
- 100% Avalanche Tested
- RoHS Compliant

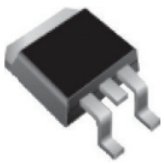
Application

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



Schematic Diagram

TO-220



TO-263

Device	Package	Marking	Packaging
GT060N10T	TO-220	GT060N10	50pcs/Tube
GT060N10M	TO-263	GT060N10	800pcs/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	120	A
Pulsed Drain Current (note1)	I_{DM}	480	A
Gate-Source Voltage	V_{GS}	±20	V
Power Dissipation	P_D	214	W
Single pulse avalanche energy （note3）	E_{AS}	81	mJ
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}	0.7	ºC/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	50	ºC/W

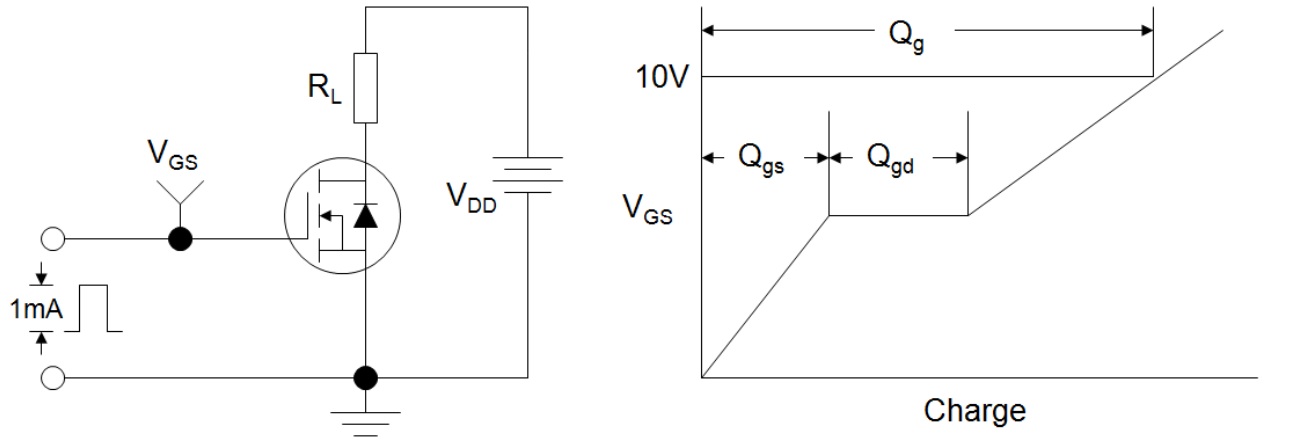
Specifications T_J = 25ºC, unless otherwise noted

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	1.9	3	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A	--	4.5	5.2	mΩ
		V_{GS} = 4.5V, I_D = 20A	--	6.5	7	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	--	70	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	4351	--	pF
Output Capacitance	C_{oss}		--	323	--	
Reverse Transfer Capacitance	C_{rss}		--	12	--	
Total Gate Charge	Q_g	V_{DS} = 50V, I_D = 20A, V_{GS} = 10V	--	60	--	nC
Gate-Source Charge	Q_{gs}		--	8	--	
Gate-Drain Charge	Q_{gd}		--	10	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V, I_D = 20A, R_G = 10Ω	--	15	--	ns
Turn-on Rise Time	t_r		--	6	--	
Turn-off Delay Time	$t_{d(off)}$		--	42	--	
Turn-off Fall Time	t_f		--	8	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	120	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 20A, V_{GS} = 0V	--	--	1.2	V

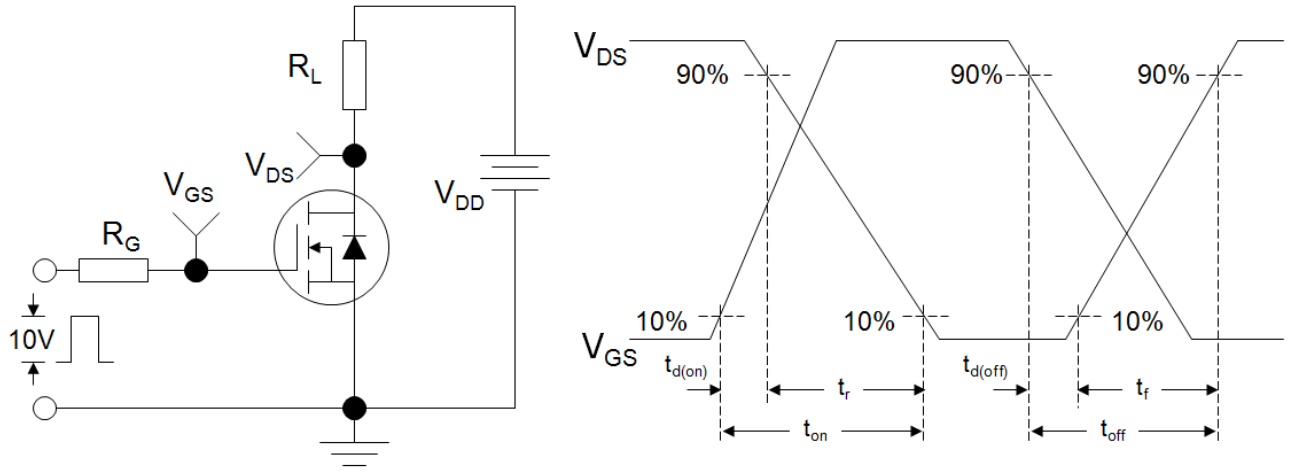
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G
3. EAS condition : Tj=25℃ ,VDD=50V,VGS=10V,L=0.5mH,Rg=25Ω

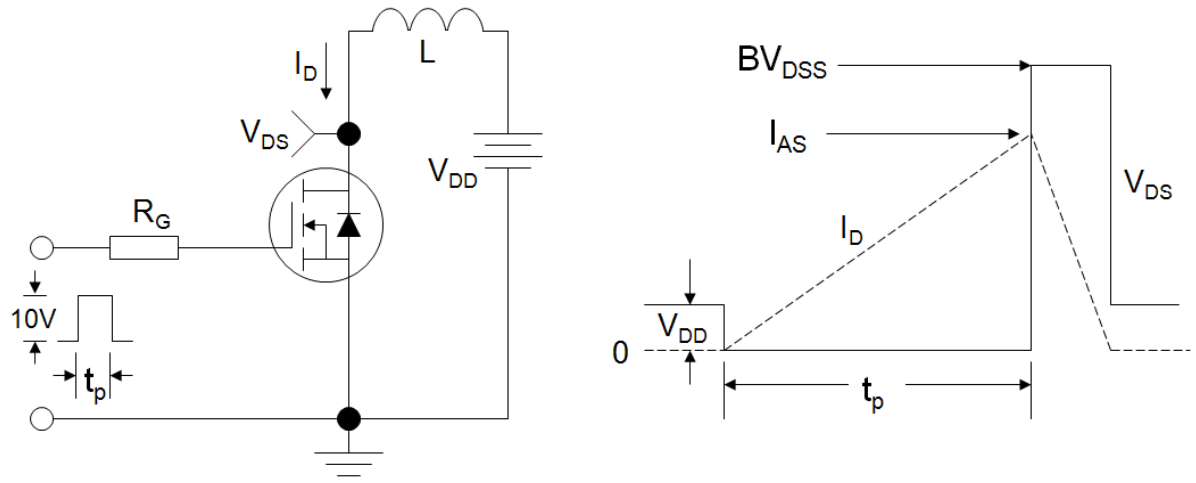
Gate Charge Test Circuit



EAS Test Circuit



Switch Time Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

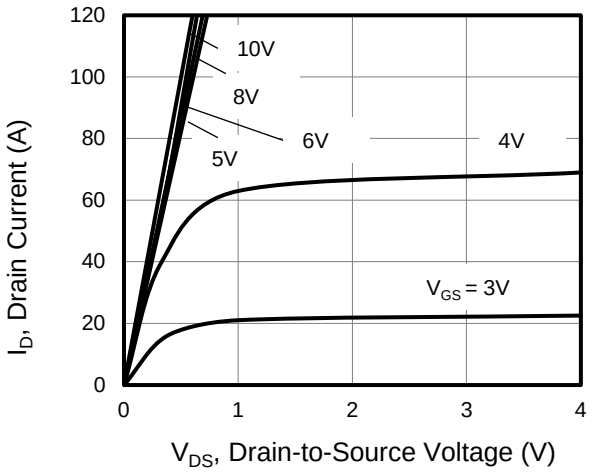


Figure 2. Transfer Characteristics

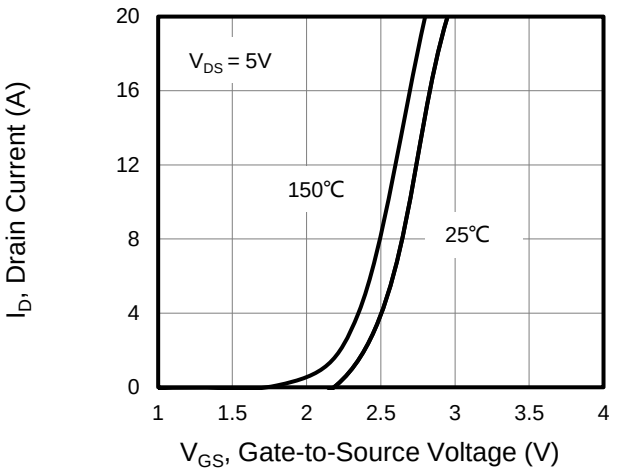


Figure 3. Gate Charge

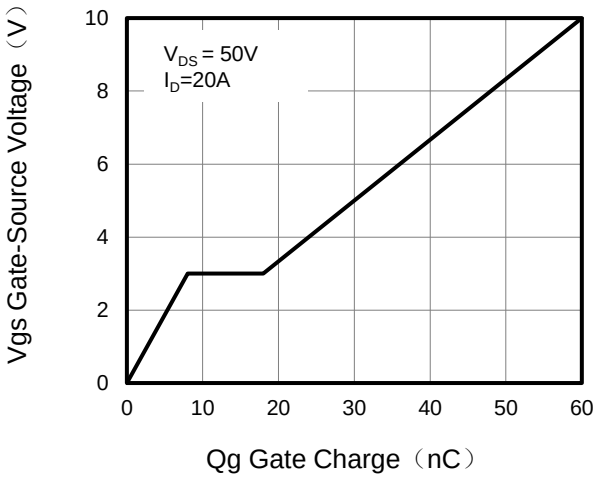


Figure 4. Drain Source On Resistance

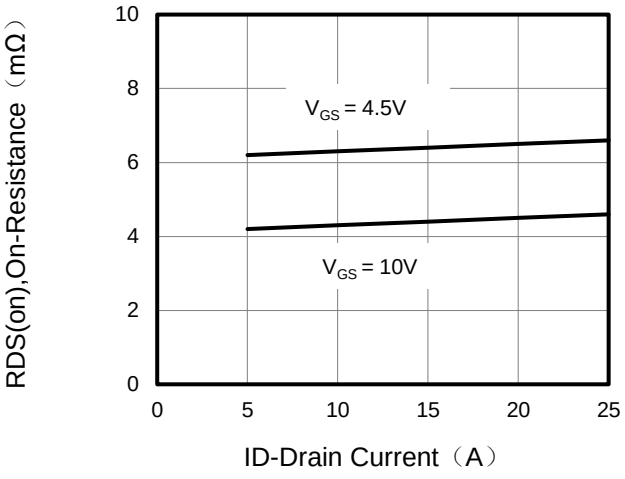


Figure 5. Capacitance vs Vds

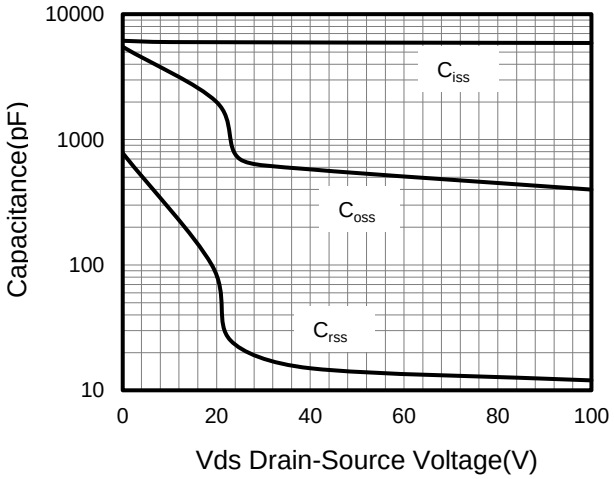
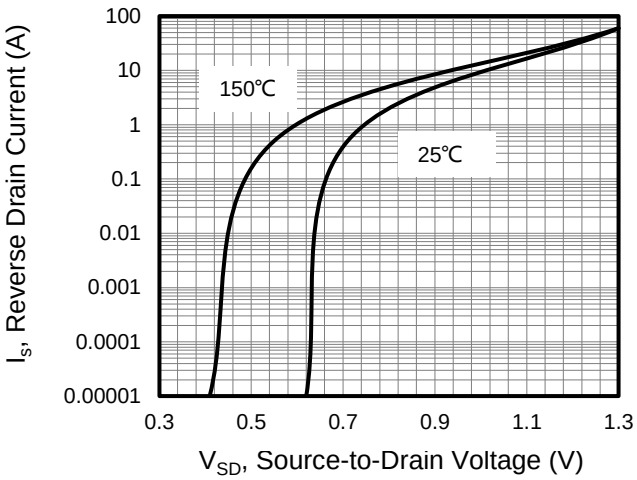


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

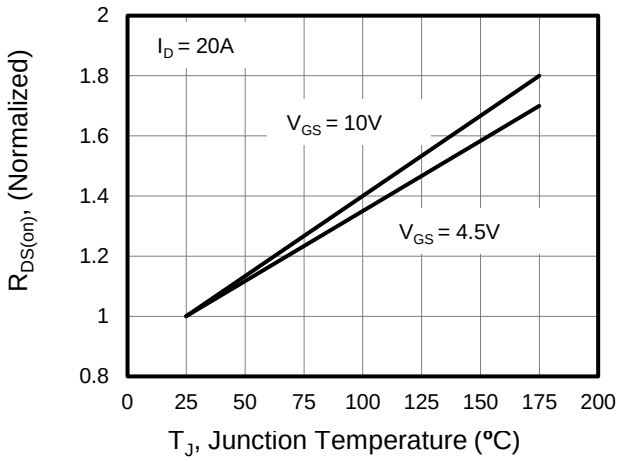


Figure 8. Safe Operation Area

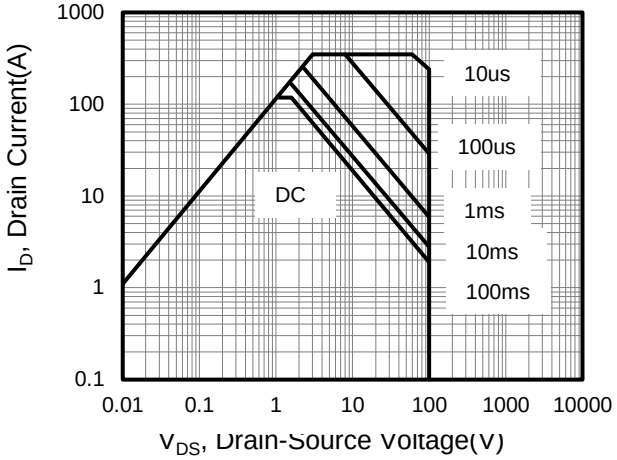
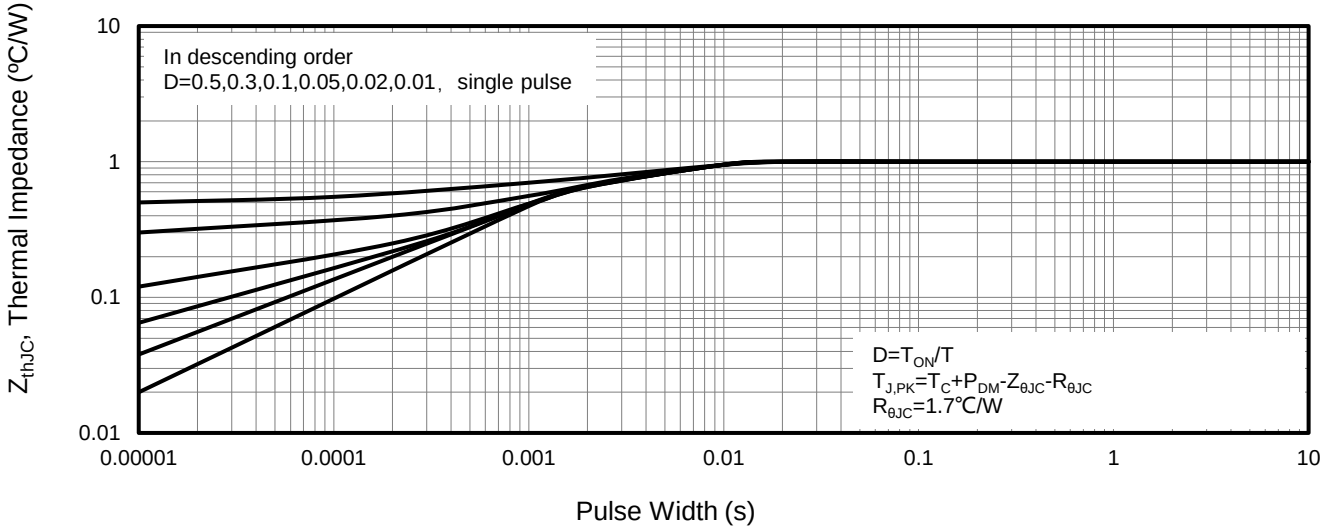
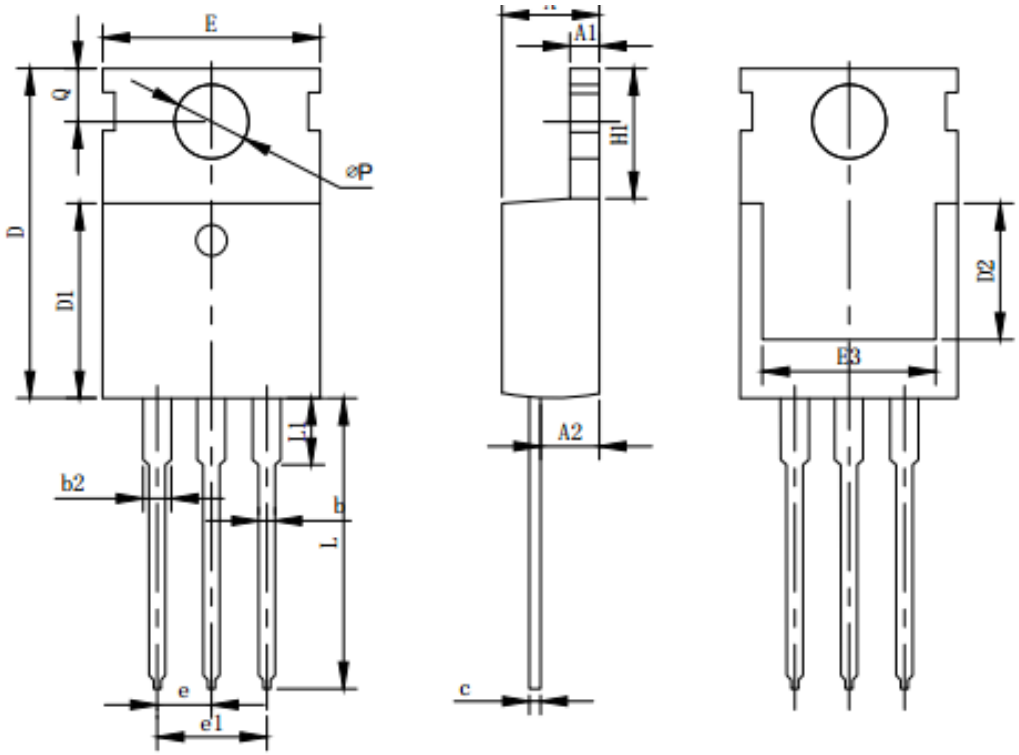


Figure 9. Normalized Maximum Transient Thermal Impedance

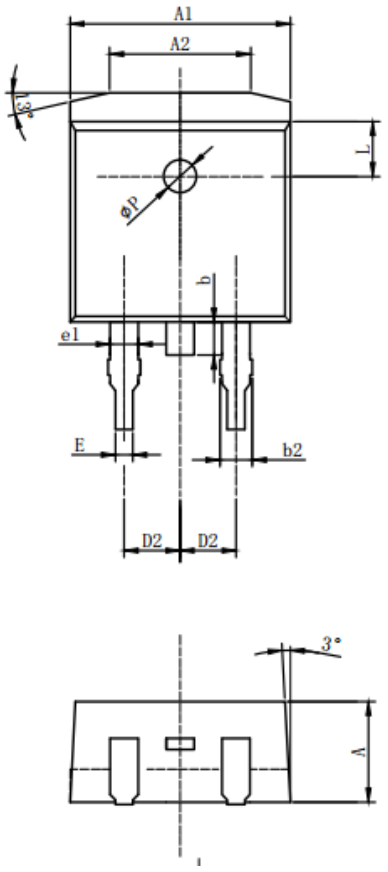


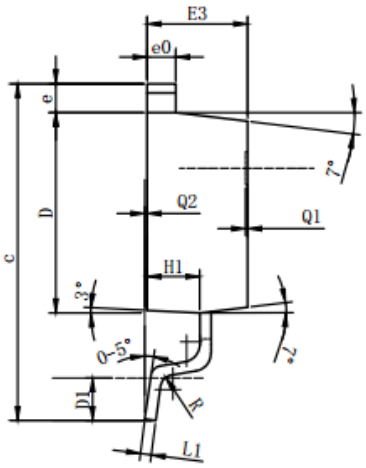
TO-220 Package Information



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