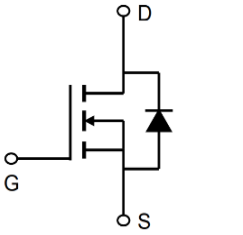
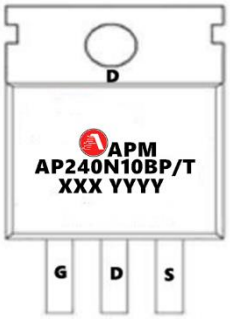
AP240N10BP/T

100V N-Channel Enhancement Mode MOSFET

Description

The AP240N10BP/T uses advanced **APM-SGT Ⅰ** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.





General Features

V_{DS} = 100V I_D =240A

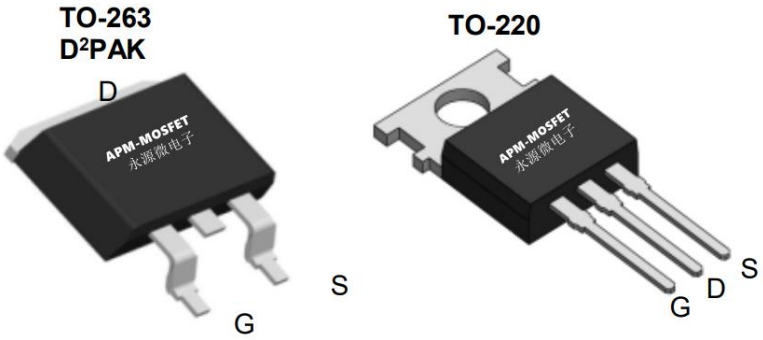
$R_{DS(ON)}$ < 2.9mΩ @ V_{GS}=10V **(Type：2.4mΩ)**

Application

Isolated DC

Motor control

Synchronous-rectification



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP240N10BP	TO-220-3L	AP240N10BP XXX YYYY	1000
AP240N10BT	TO-263-3L	AP240N10BT XXX YYYY	800

Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	100	V
VGS	Gate-Source Voltage	±20	V
I_D@T_A=25℃	Continuous Drain Current[1]	240	A
I_D@T_A=70℃	Continuous Drain Current[1]	179	A
IDM	Pulsed Drain Current[2]	1136	A
EAS	Single Pulse Avalanche Energy[3]	1350	mJ
IAS	Avalanche Current	52	A
P_D@T_A=25℃	Total Power Dissipation[4]	416	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	40	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	0.70	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	ID = 250uA, VGS = 0V	100	108		V
IDSS	Zero Gate Voltage Drain Current	VDS = 80V, VGS = 0V			1.0	nA
IGSS	Gate-Body Leakage Current	VDS = 0V, VGS = ±20V			±100	nA
VGS(th)	Gate Threshold Voltage	VDS = VGS, ID = 250nA	2.0	2.9	4.0	V
RDS(ON)	Static Drain-Source ON-Resistance	VGS = 10V, ID = 20A		2.4	2.9	mΩ
gFS	Forward Transconductance	VDS = 5V, ID = 20A		67		S
Ciss	Input Capacitance	VGS = 0V, VDS = 50V, f = 1MHz		9256		pF
Coss	Output Capacitance			1318		pF
Crss	Reverse Transfer Capacitance			30		pF
Rg	Gate Resistance	VGS = 0V, VDS= 0V, f = 1MHz		1.0		Ω
Qg	Total Gate Charge (@ VGS = 10V)	VGS = 0 to 10V VDS = 50V, ID = 20A		131		nC
Qg	Total Gate Charge (@ VGS = 6.0V)			83		nC
Qgs	Gate Source Charge			46		nC
Qgd	Gate Drain Charge			27		nC
tD(on)	Turn-On DelayTime	VGS = 10V, VDS = 50V RL = 2.5Ω, RGEN = 3Ω		33		ns
tr	Turn-On Rise Time			33		ns
tD(off)	Turn-Off DelayTime			63		ns
tf	Turn-Off Fall Time			23		ns
trr	Body Diode Reverse Recovery Time	IF=20A, dIF/dt = 100A/ns		91		ns
Qrr	Body Diode Reverse Recovery Charge	IF=20A, dIF/dt = 100A/s		250		nC
VSD	Diode Forward Voltage	IS = 1A, VGS = 0V		0.66	1.0	V
IS	Diode Continuous Current	TC = 25°C			284	A

Note :

1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、The EAS data shows Max. rating . The test condition is VDD=50V,VGS=10V, L=0.5mH IAS=52A

4、The power dissipation is limited by 150℃ junction temperature

5、The data is theoretically the same as I D and I DM , in real applications , should be limited by total power dissipation

Typical Characteristics

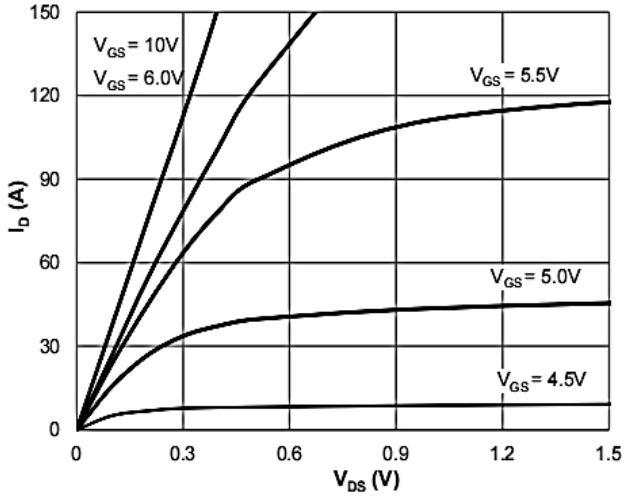


Figure 1: Saturation Characteristics

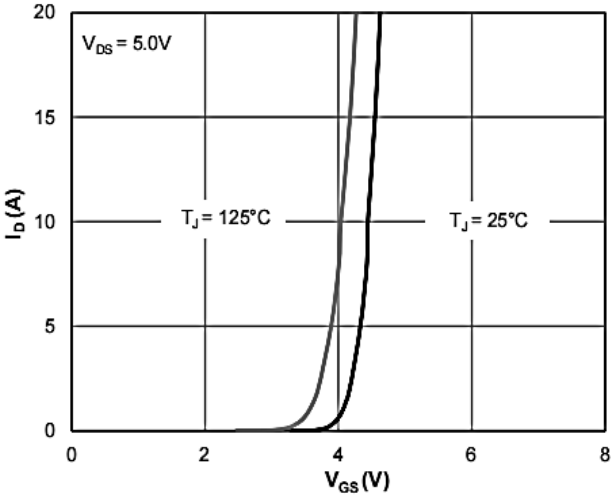


Figure 2: Transfer Characteristics

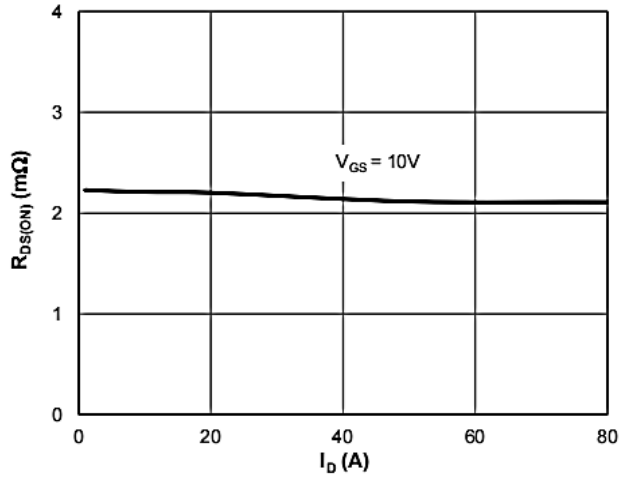


Figure 3: $R_{DS(ON)}$ vs. Drain Current

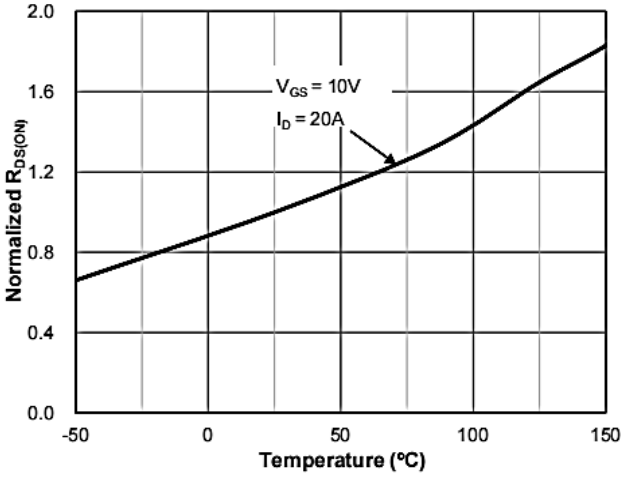


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

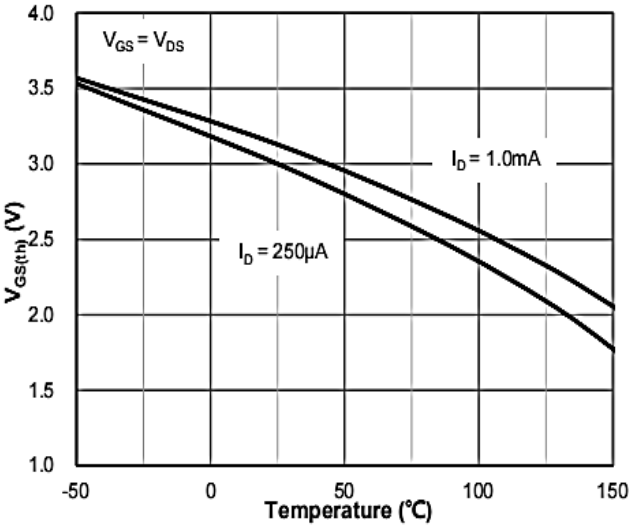


Figure 5: VGS(th) vs. Junction Temperature

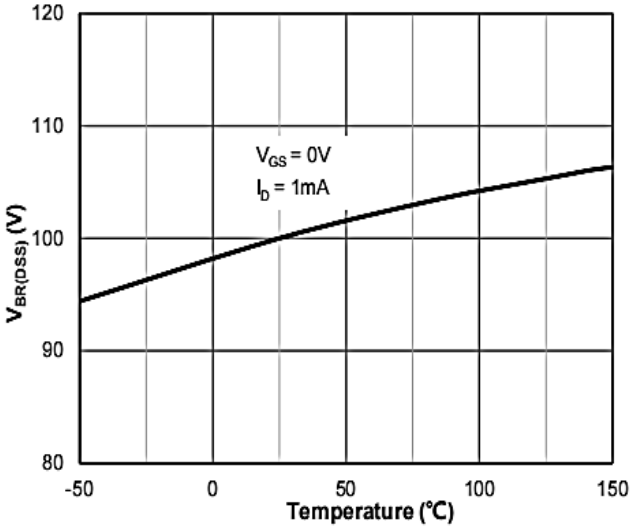


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

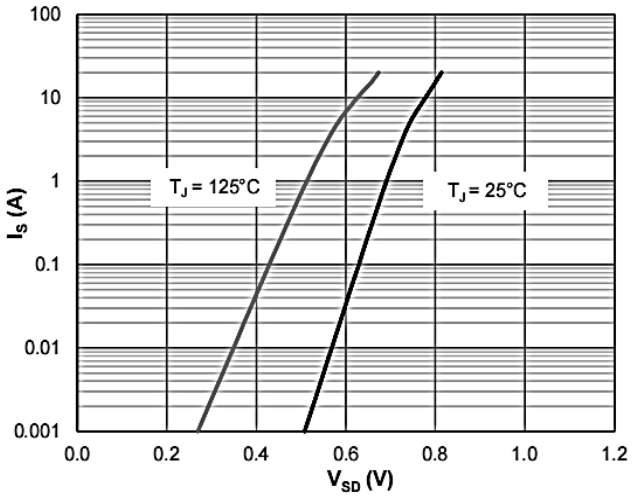


Figure 7: Body-Diode Characteristics

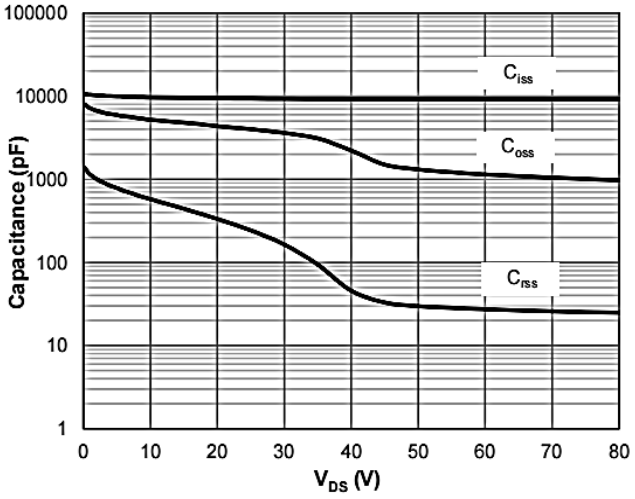


Figure 8: Capacitance Characteristics

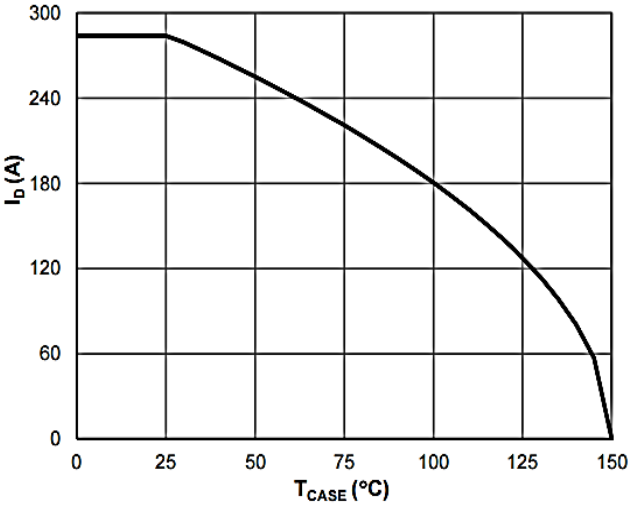


Figure 9: Current De-rating

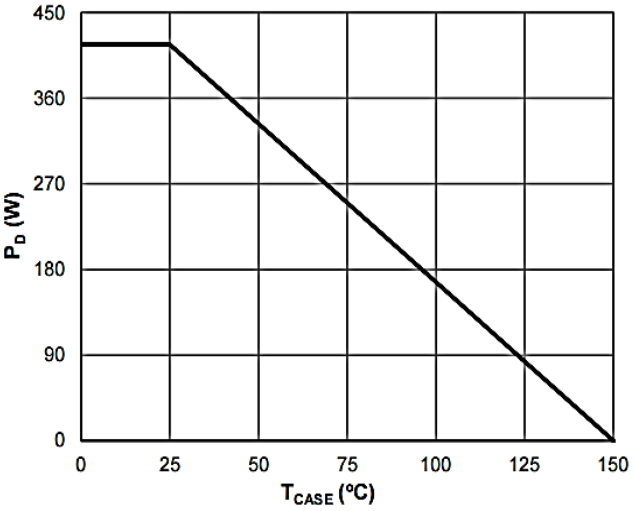


Figure 10: Power De-rating

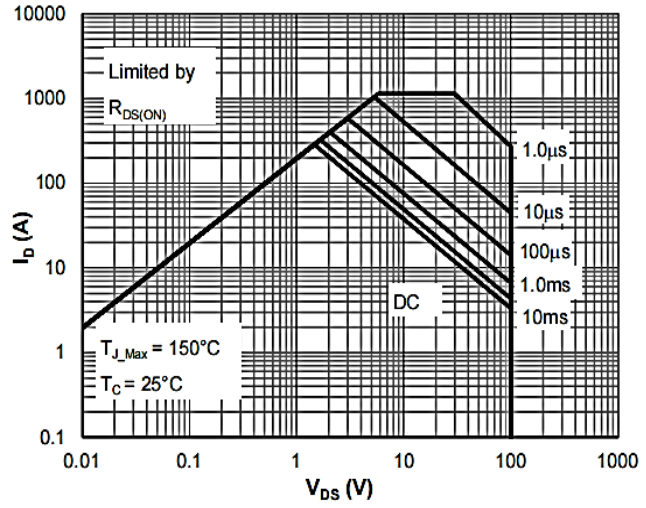


Figure 11: Maximum Safe Operating Area

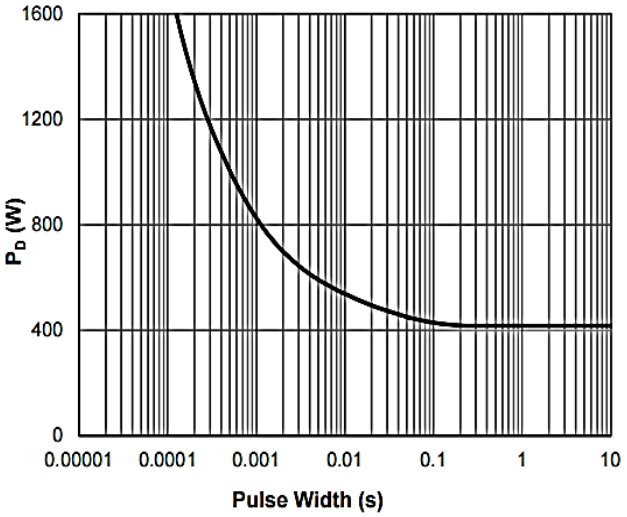


Figure 12: Single Pulse Power Rating, Junction-to-Case

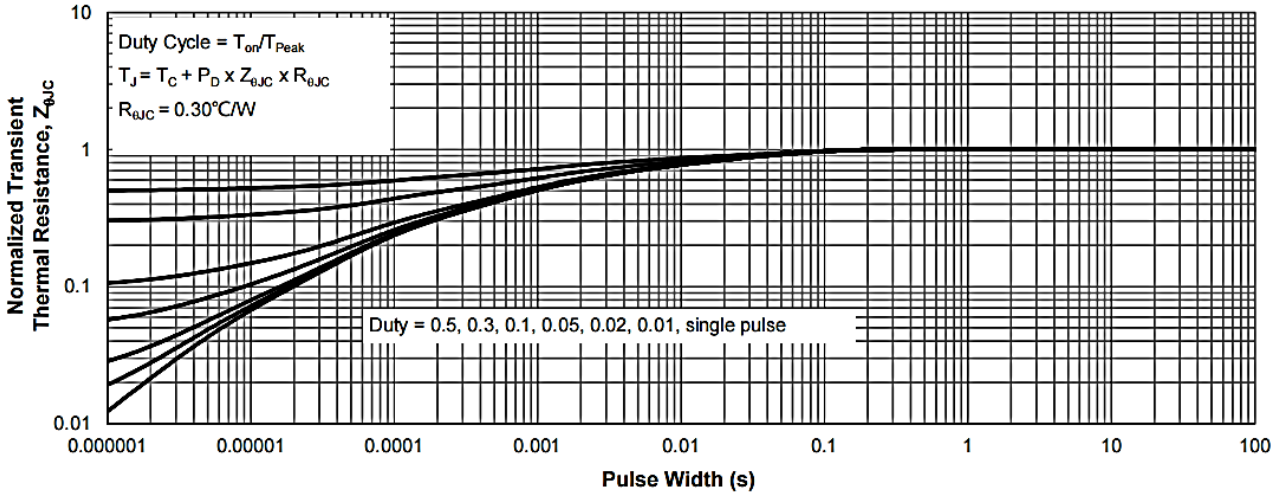
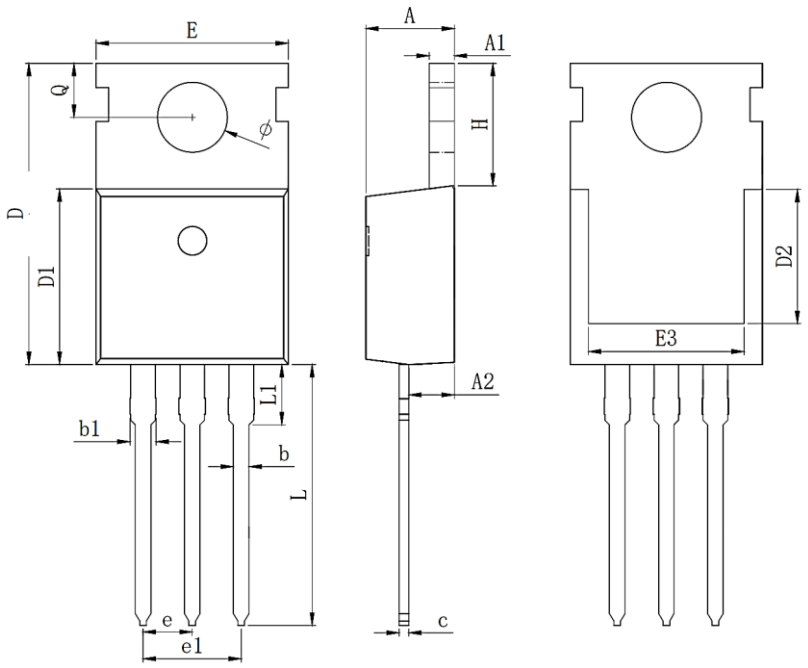


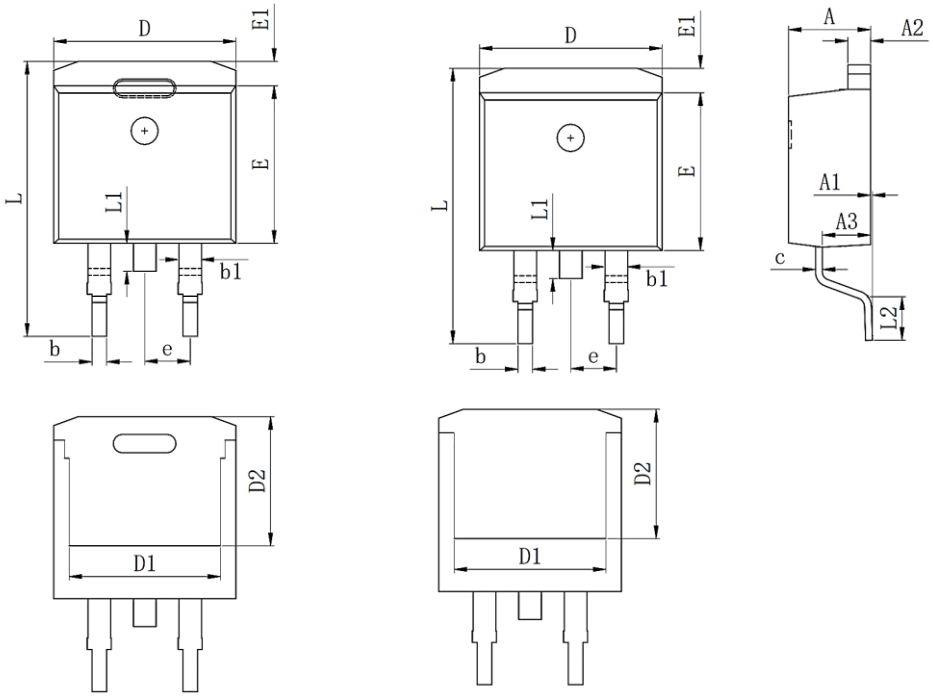
Figure 13: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data:TO-220C-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	4.25	4.5	4.7
A1	1.15	1.3	1.45
A2	2.15	2.35	2.55
b	0.65	0.8	0.95
b1	1.15	1.35	1.55
c	0.35	0.5	0.65
D	14.3	15.3	16.3
D1	8.8	9.1	9.4
D2		6.3REF	
E	9.7	10	10.3
E3	7	8	9
e		2.54BSC	
e1		5.08BSC	
L	12.7	13.5	13.9
L1		3.1	3.4
H	6	6.5	6.85
Q	2.6	2.8	3
ϕ	3.4	3.6	3.8

Package Mechanical Data:TO-263C-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	4.37	4.57	4.77
A1	0		0.25
A2	1.22	1.27	1.42
A3	2.49	2.69	2.89
b	0.7	0.81	0.96
b1	1.17	1.27	1.47
c	0.3	0.38	0.53
D	9.86	10.16	10.36
D1	8.4REF		
D2	7.073REF		
E	8.5	8.7	8.9
E1	1.07	1.27	1.47
e	2.54BSC		
L	17.7	15.1	15.5
L1	1.4	1.55	1.7
L2	2	2.3	2.6
H	6	6.5	6.85
Q	2.6	2.8	3
ϕ	3.4	3.6	3.8

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Edition	Date	Change
REV1.0	2024/1/31	Initial release