General Description

The UV130N10R uses advanced Trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

This device is suitable for use in PWM, load switching and general purpose applications.

Pb-Free RoHS

VDS	100	V
$R_{DS(on)\ TYP}$@V_{GS}=10V	7	mΩ
I_D	130	A

Features

N-Channel, 5V Logic Level Control

Enhancement Mode

Very low on-resistance R_{DS}(on) @ V_{GS}=10V

100% Avalanche Tested

Pb-free lead plating; ROHS compliant

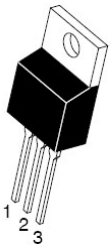
Applications

Power switching application

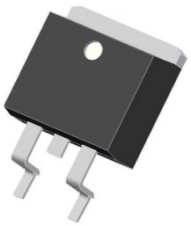
Hard Switched and High Frequency Circuits

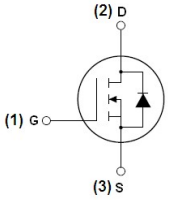
Uninterruptible Power Supply

Isolated DC/DC Converters in Telecom and Industrial



TO-220AB-3L


TO-263-2L



Schematic diagram

Package Marking And Ordering Information

Part ID	Package Type	Marking	Tape and Reel information
UV130N10R	TO-220AB	UV130N10R	50pcs/Tube
UV130N10R	TO-263-2L	UV130N10R	800pcs/Tube

Maximum ratings, at Tj=25℃, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain –Source breakdown voltage		100	V
I_S	Diode continuous forward current	T_c=25℃	130	A
I_D	Continuous drain current @V_{gs}=10V	T_c=25℃	130	A
		T_c=100℃	80	A
I_{DM}	Pulse drain current tested①	T_c=25℃	380	A
E_{AS}	Avalanche energy, single pulsed②		1400	mJ
P_D	Maximum power dissipation	T_c=25℃	400	W
V_{GS}	Gate-Source voltage		±25	V
T_{STG} T_J	Storage and operating temperature range		-55 to 175	℃

Thermal Characteristic

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.3	℃/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62.5	℃/W

Typical Characteristics

Symbol	Parameter	Condition	Min	Type	Max	Unit
Static Electrical Characteristics @Tj=25℃ (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V, V_{GS}=0V			1	μA
	Zero Gate Voltage Drain Current(Tj=125℃)	V_{DS}=80V, V_{GS}=0V			100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±25V,V_{DS}=0V			±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=VGS, I_D=250μA	2		4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=10V,I_D=40A		7	8	mΩ
Dynamic Electrical Characteristics @T_j=25℃ (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=30V,		6700		PF
C_{oss}	Output Capacitance	V_{GS}=0V,		1000		PF
C_{rss}	Reverse Transfer Capacitance	F=1MHz		510		PF
R_g	Gate Resistance	F=1MHz		2		Ω
Q_g	Total Gate Charge	V_{DS}=30V,		155		nC
Q_{gs}	Gate-Source Charge	I_D=60A,		45		nC
Q_{gd}	Gate-Drain Charge	V_{GS}=10V		48		nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay time	V_{DD}=35V		23		nS
t_r	Turn-on Rise time	I_D=1A		42		nS
$t_{d(off)}$	Turn-off Delay time	R_G=3.5Ω		120		nS
t_f	Turn-off Fall time	V_{GS}=10V		75		nS
Source-Drain Diode Characteristics						
V_{SD}	Forward on voltage	I_{SD}=20A, V_{GS}=0V		0.8	1.3	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{SD}=20A		68		nS
Q_{rr}	Reverse Recovery Charge	V_{GS}=0V,di/dt=500A/μs		130		nC

Note:

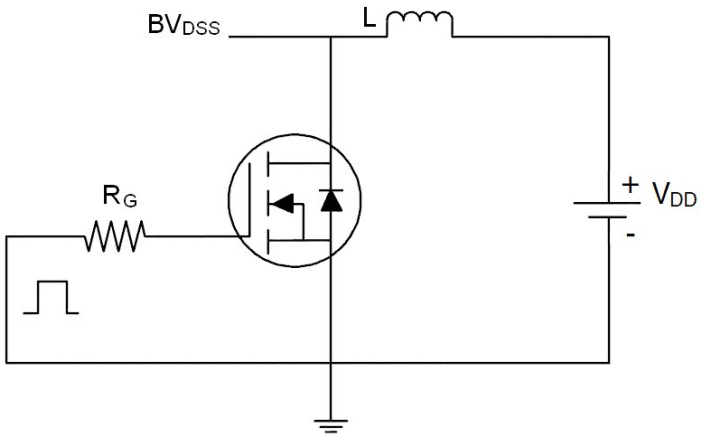
① Repetitive rating; pulse width limited by max, junction temperature.

② Limited by $T_J$max, starting T_J=25℃, L=0.5mH, R_G=25Ω, I_{AS}=20A, V_{GS}=10V, Part not recommended for use above this value

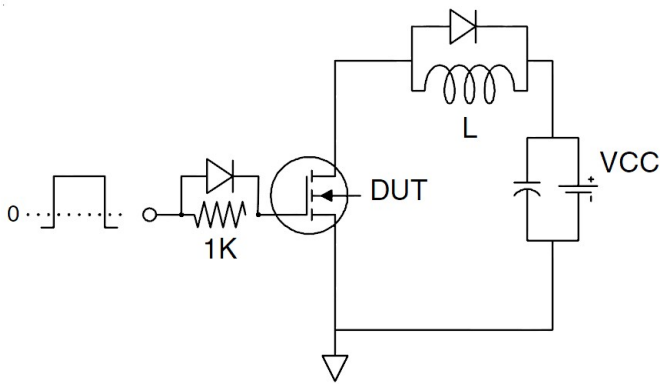
③ Pulse width ≦300μs; duty cycle≦2%

Test circuit

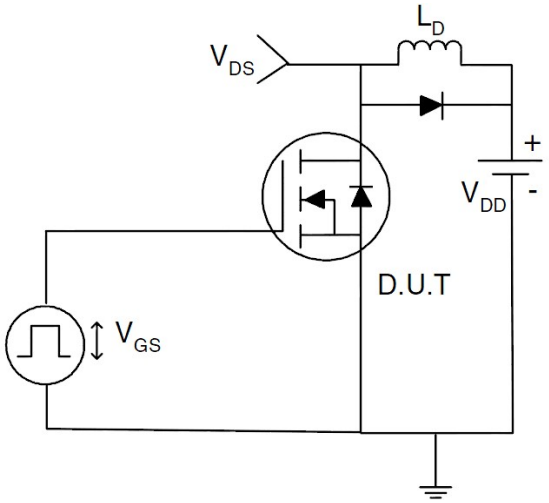
(1) **E_{AS} test circuits**



(2) **Gate charge test circuit**

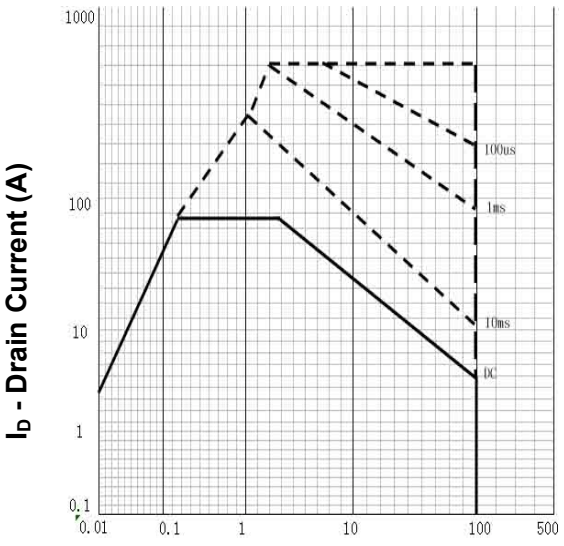


(3) **Switch time test circuit**



Typical Characteristics

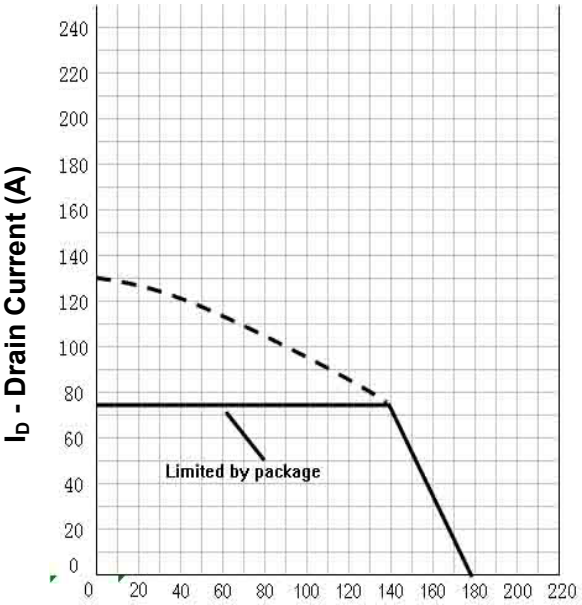
Safe Operation Area



I_D - Drain Current (A)

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

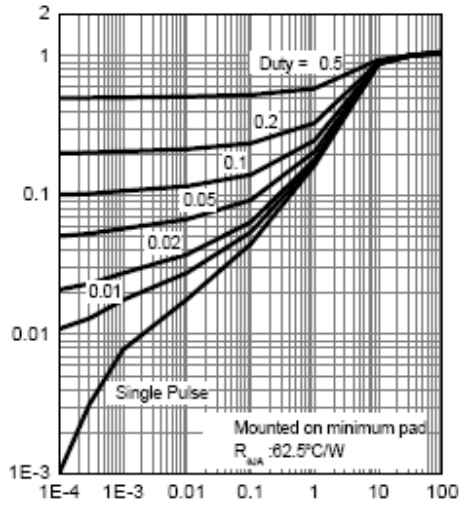
Drain Current



I_D - Drain Current (A)

T_j - Junction Temperature (˚C)

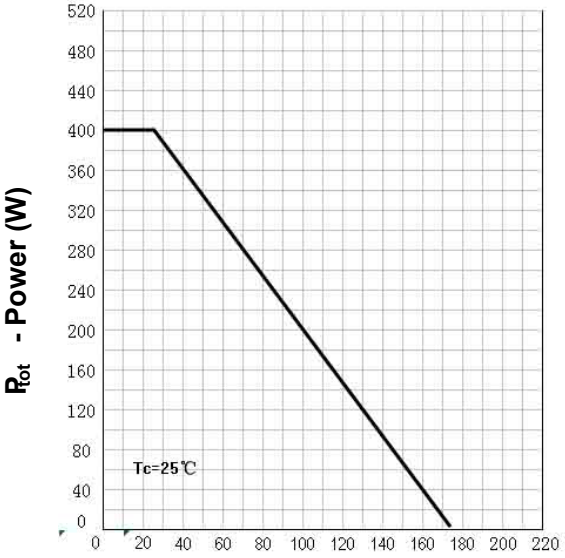
Thermal Transient Impedance



Normalized Effective Transient

Square Wave Pulse Duration (sec)

Power Dissipation

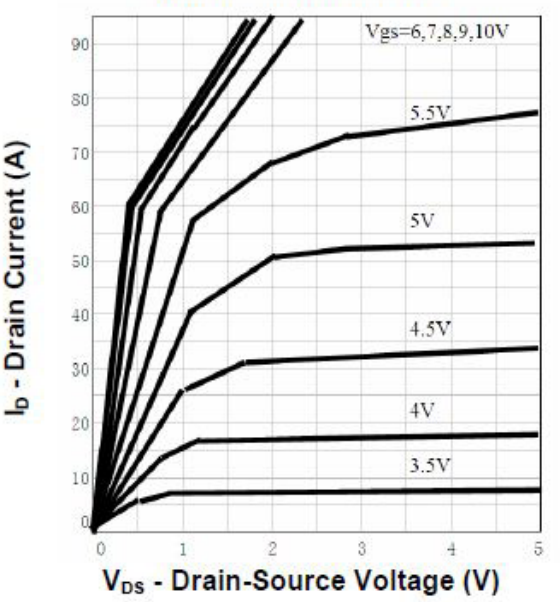


P_{tot} - Power (W)

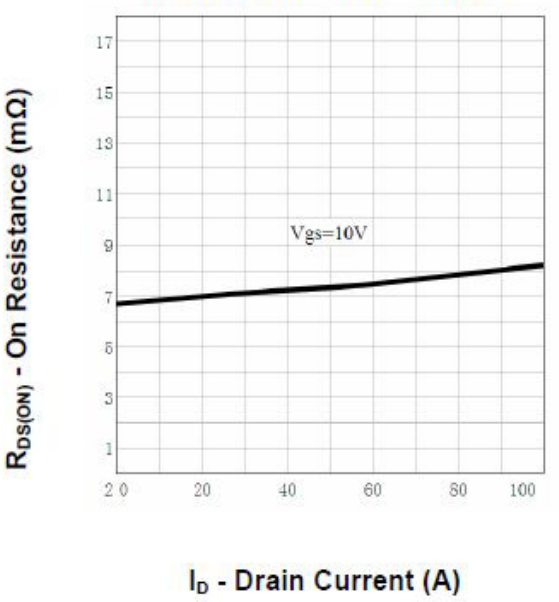
T_j - Case Temperature (˚C)

Typical Characteristics

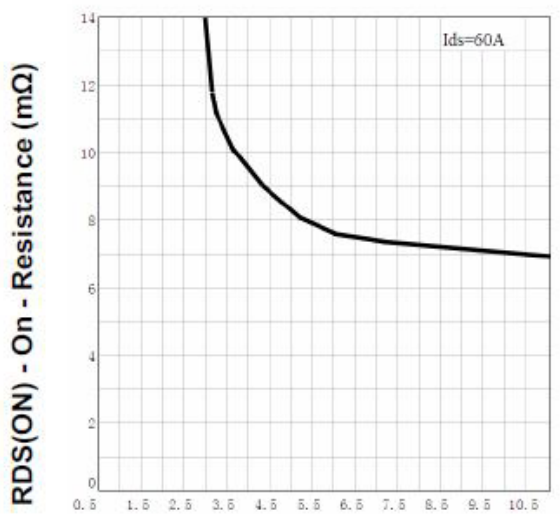
Output Characteristics



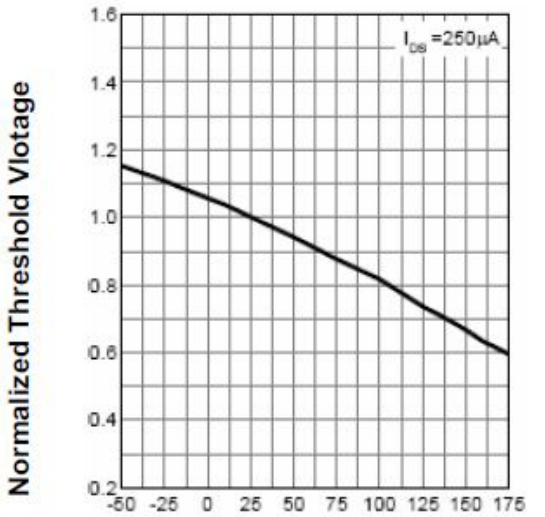
Drain-Source On Resistance



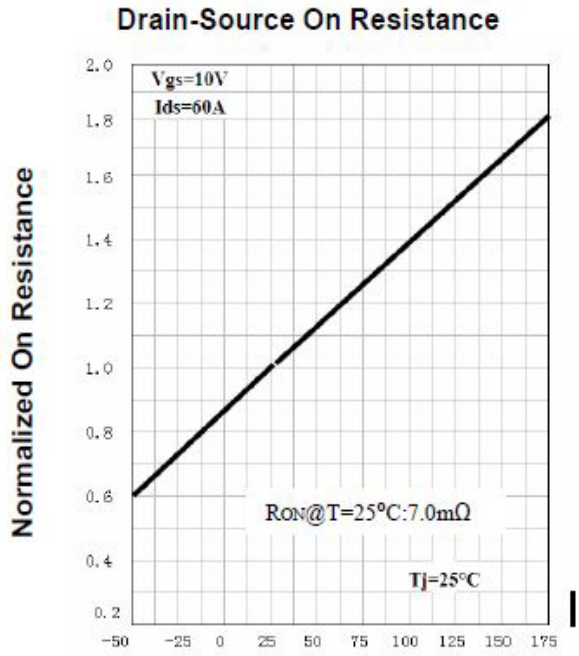
Drain-Source On Resistance

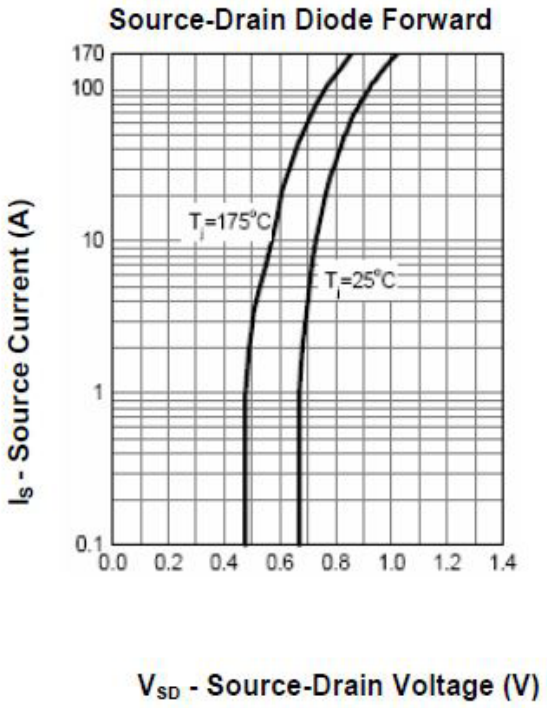


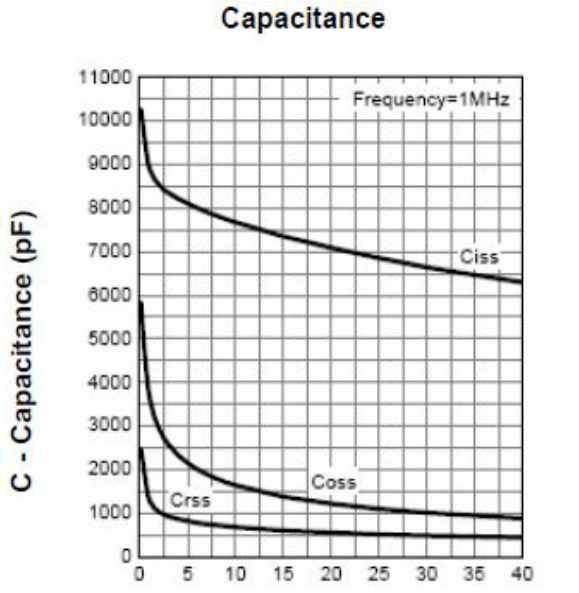
Gate Threshold Voltage

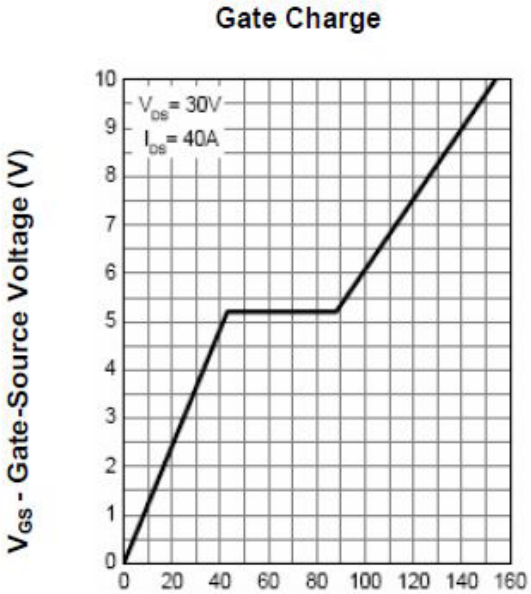


Typical Characteristics

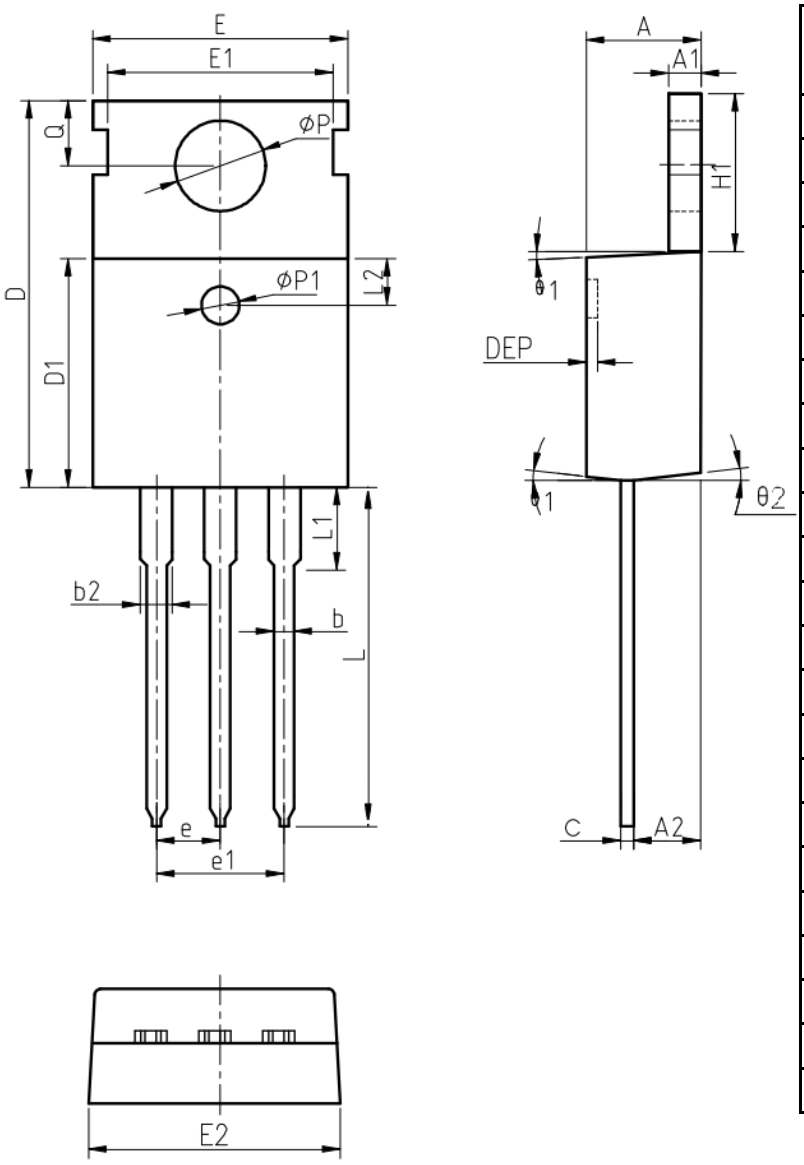








TO-220AB Package Outline Data



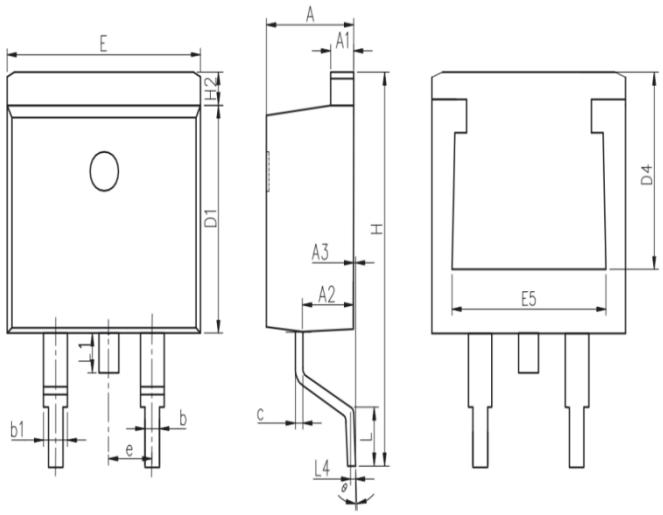
Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	4.30	4.52	4.70
A1	1.15	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	1.00
b2	1.17	1.32	1.50
c	0.45	0.50	0.61
D	15.30	15.65	15.90
D1	9.00	9.20	9.40
DEP	0.05	0.10	0.25
E	9.66	9.90	10.28
E1	-	8.70	-
E2	9.80	10.00	10.20
ΦP1	1.40	1.50	1.60
e	2.54 BSC		
e1	5.08 BSC		
H1	6.40	6.50	6.80
L	12.70	-	14.27
L1	-	-	3.95
L2	2.40	2.50	2.60
ΦP	3.53	3.60	3.70
Q	2.70	2.80	2.90
θ1	5 °	7 °	9 °
θ2	1 °	3 °	5 °

Notes:

1. Refer to JEDEC TO-220 variation AB
2. Dimension "D" and "E" do NOT include mold flash. Mold flash shall not exceed 0.127mm per side.

Package Information

TO-263-2L



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.49	2.69	2.89
A3	0	0.13	0.25
b	0.7	0.81	0.96
b1	1.17	1.27	1.47
c	0.3	0.38	0.53
D1	8.5	8.7	8.9
D4	6.6	-	-
E	9.86	10.16	10.36
E5	7.06	-	-
e	2.54 BSC		
H	14.7	15.1	15.5
H2	1.07	1.27	1.47
L	2	2.3	2.6
L1	1.4	1.55	1.7
L4	0.25 BSC		
θ	0°	5°	9°