MPVX10N65B Series
Power MOSFET

FEATURES

- BV_{DSS}: 650V, I_D=10A
- $R_{DS(on)}$: 1.1Ω(Max) @V_{GS}=10V
- Very Low FOM ($R_{DS(on)}$ *Q_g)
- Excellent stability and uniformity

APPLICATIONS

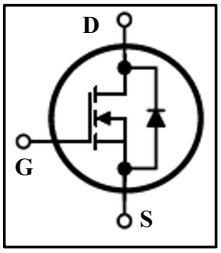
- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC to DC Converters

TO-220F

TO-220

TO-262

TO-263



Ordering Information

Type NO.	Marking	Package Code
MPVA10N65B	MPVA10N65B	TO-220F
MPVP10N65B	MPVP10N65B	TO-220
MPVH10N65B	MPVH10N65B	TO-262
MPVC10N65B	MPVC10N65B	TO-263

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value		Unit
			220F	220-262-263	
Drain-Source Voltage (V_{GS} = 0V)		V_{DSS}	650		V
Continuous Drain Current		I_D	10		A
Pulsed Drain Current	(note1)	I_{DM}	40		A
Gate-Source Voltage		V_{GSS}	±30		V
Single Pulse Avalanche Energy	(note2)	E_{AS}	720		mJ
Avalanche Current	(note1)	I_{AR}	8		A
Repetitive Avalanche Energy	(note1)	E_{AR}	45		mJ
Power Dissipation (T_C = 25ºC)		P_D	65	147	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150		ºC

Thermal Resistance

Parameter	Symbol	Value		Unit
		220F	220-262-263	
Thermal Resistance, Junction-to-Case	R_{thJC}	1.92	0.85	ºC/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62.5	60.0	

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	650	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650V, V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±30V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	--	4.0	V
Drain-Source On-Resistance (Note4)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 5A	--	0.85	1.1	Ω
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	--	1573	--	pF
Output Capacitance	C_{oss}		--	138	--	
Reverse Transfer Capacitance	C_{rss}		--	15	--	
Total Gate Charge	Q_g	V_{DD} = 520V, I_D = 10A, V_{GS} = 10V	--	33	--	nC
Gate-Source Charge	Q_{gs}		--	7	--	
Gate-Drain Charge	Q_{gd}		--	13	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 325V, I_D = 10A, R_G = 25Ω	--	23	--	ns
Turn-on Rise Time	t_r		--	15	--	
Turn-off Delay Time	$t_{d(off)}$		--	90	--	
Turn-off Fall Time	t_f		--	30	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	10	A
Pulsed Diode Forward Current	I_{SM}		--	--	40	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 10.0A, V_{GS} = 0V	--	--	1.4	V
Reverse Recovery Time	t_{rr}	V_R = 400V, I_F = 10.0A, di_F/dt = 100A/μs	--	500	--	ns
Reverse Recovery Charge	Q_{rr}		--	3.2	--	μC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 8A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%
4. Essentially independent of operating temperature

Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

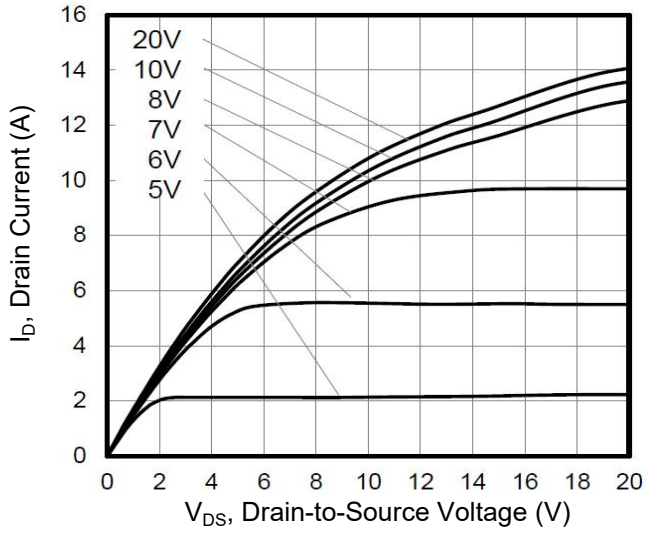


Figure 2. Transfer Characteristics

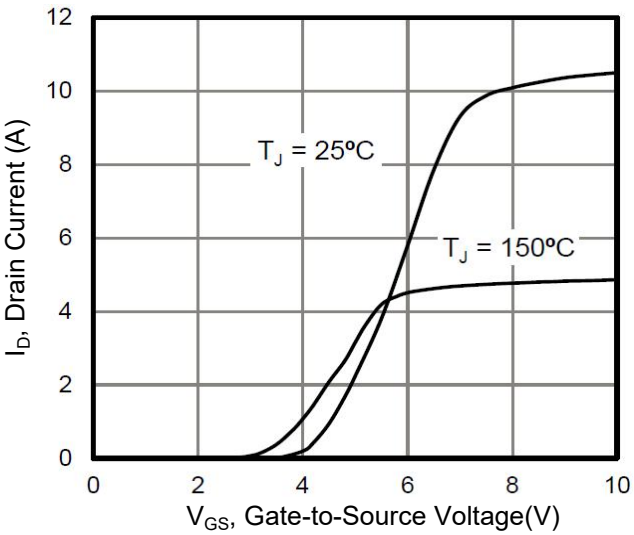


Figure 3. BV_{DSS} vs. Temperature

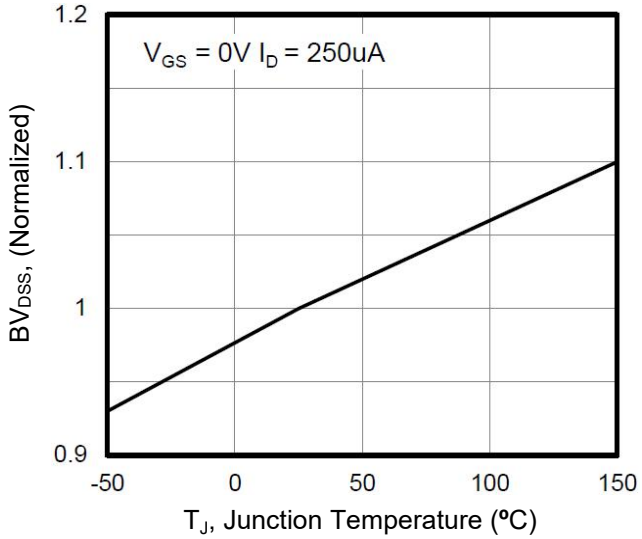


Figure 4. On-Resistance vs. Temperature

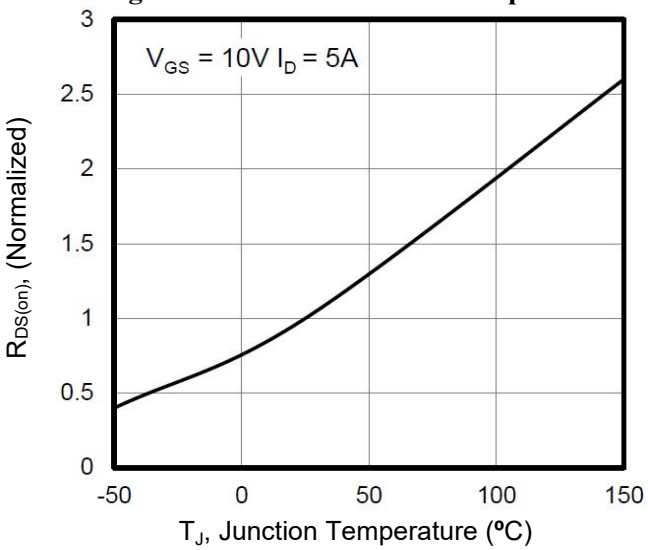


Figure 5. Gate Charge

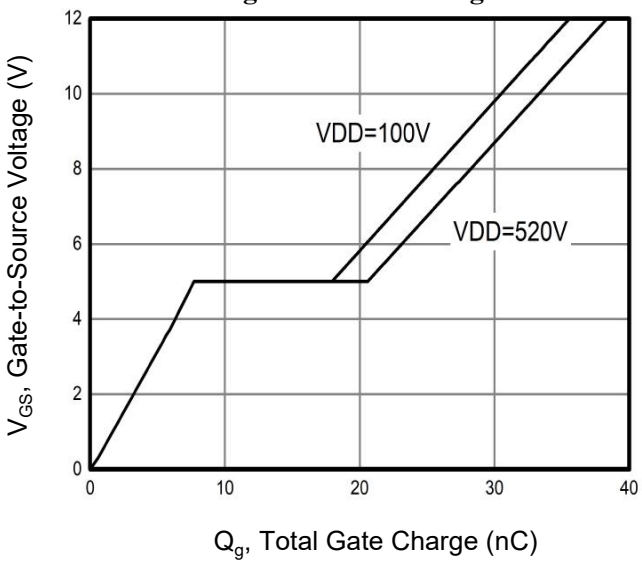
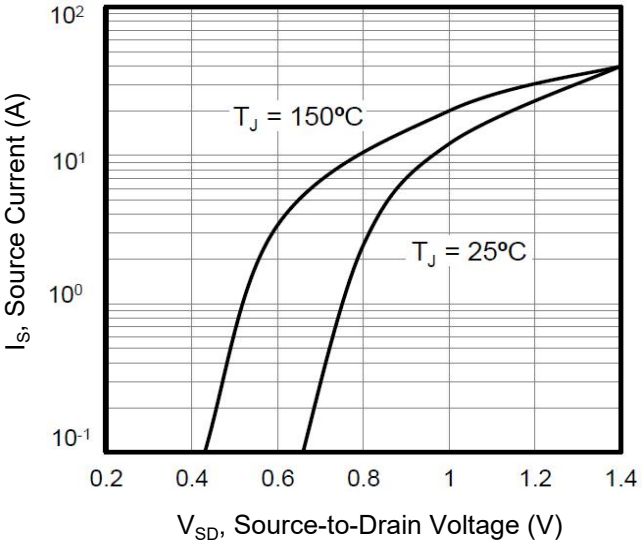


Figure 6. Body Diode Forward Voltage



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Transient Thermal Impedance (TO-220F)

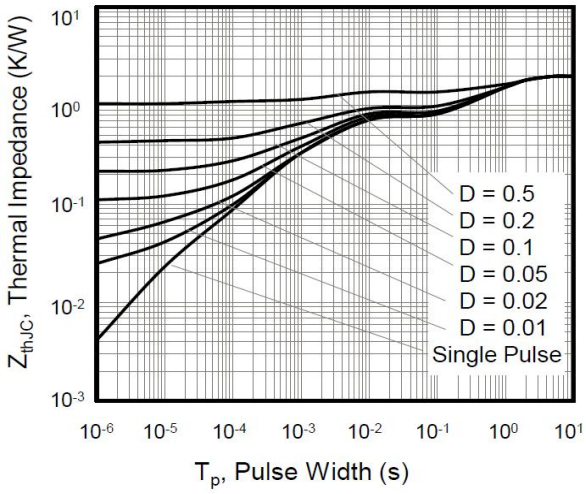


Figure 8. Transient Thermal Impedance (TO-262 TO-220 TO-263)

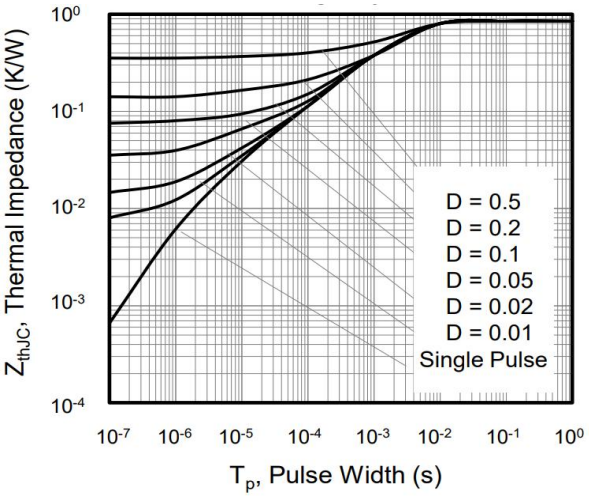


Figure A：Gate Charge Test Circuit and Waveform

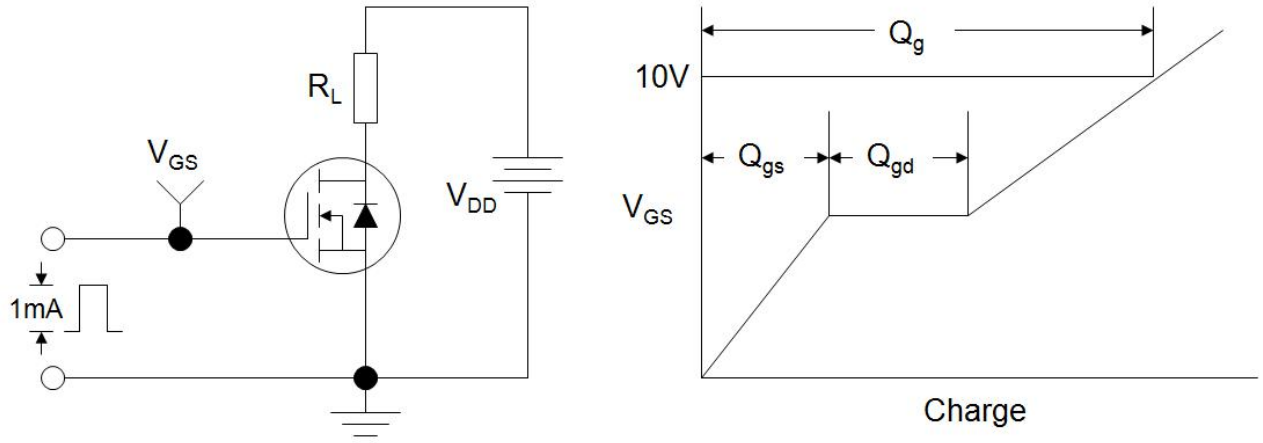


Figure B：Resistive Switching Test Circuit and Waveform

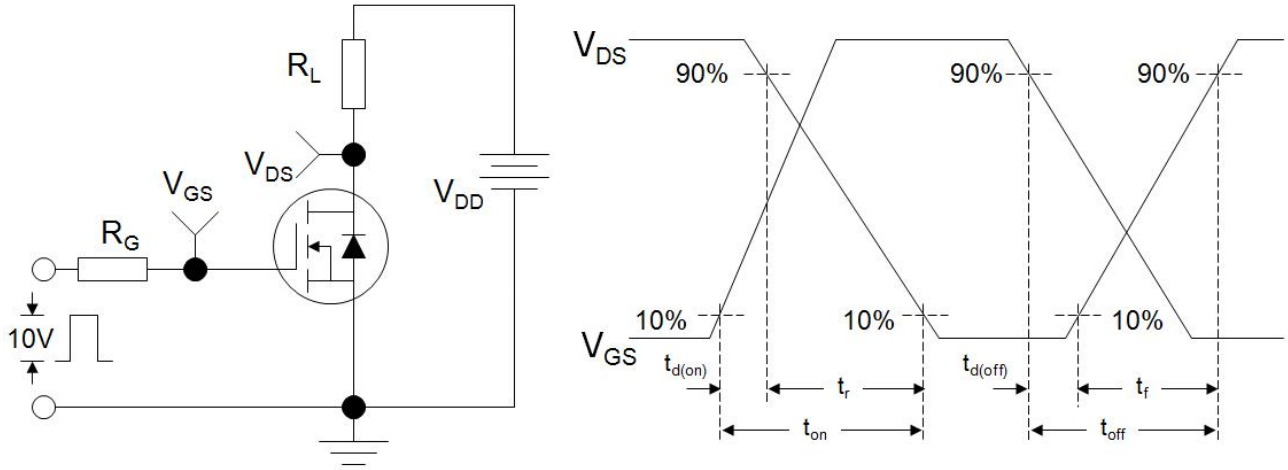
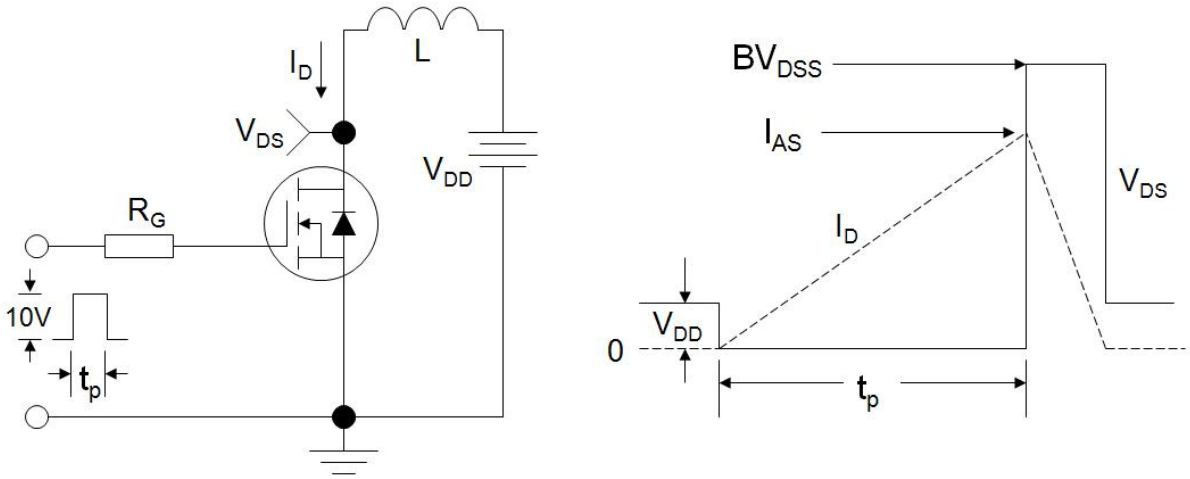


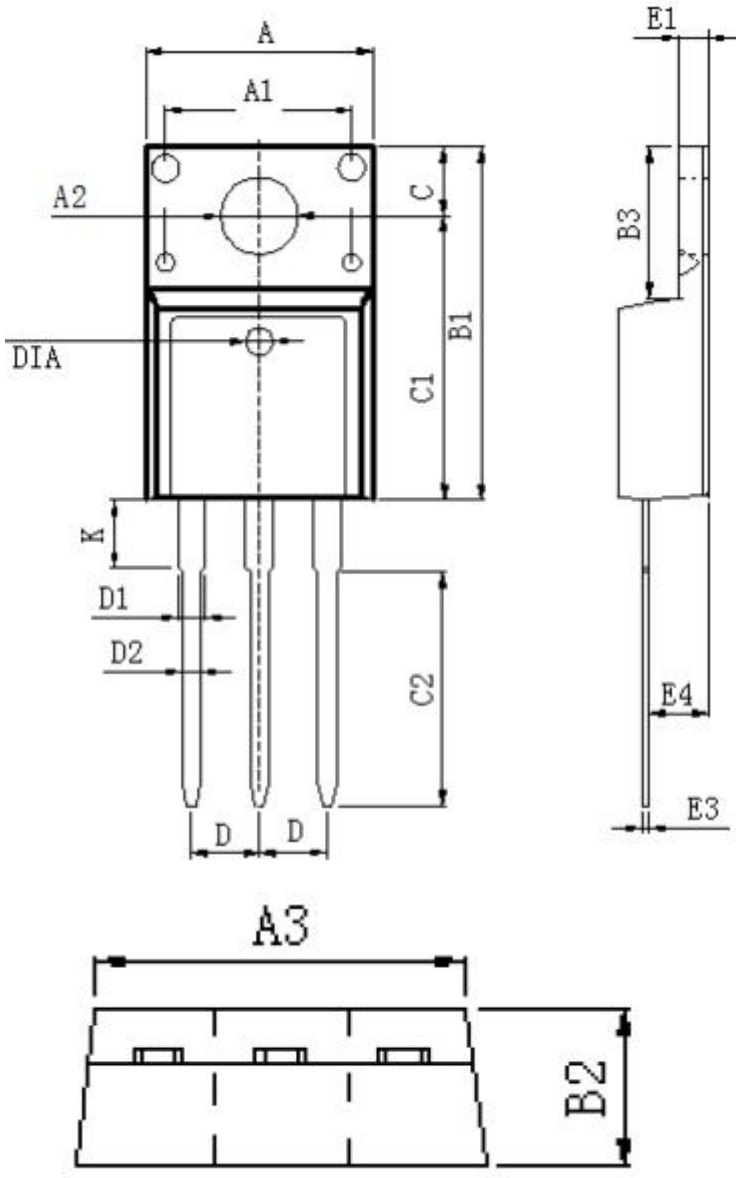
Figure C：Unclamped Inductive Switching Test Circuit and Waveform



Outline Dimension

Unit: mm

TO-220F



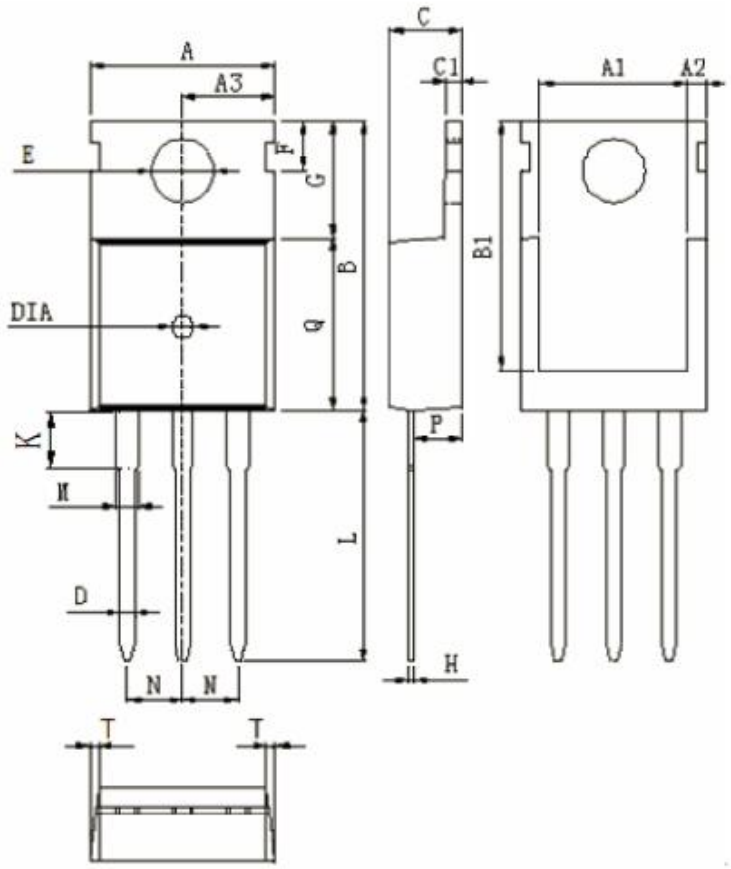
DIM	MILLIMETERS
A	10.16±0.3
A1	7.00±0.1
A2	3.3±0.2
A3	9.5±0.2
B1	15.87±0.3
B2	4.7±0.2
B3	6.68±0.4
C	3.3±0.2
C1	12.57±0.3
C2	10.02±0.5
D	2.54±0.05
D1	1.28±0.2
D2	0.8±0.1
K	3.1±0.3
E1	2.54±0.1
E3	0.5±0.1
E4	2.76±0.2
DIA	⊙1.5(deep 0.2)

Unit :mm

Outline Dimension

Unit: mm

TO-220



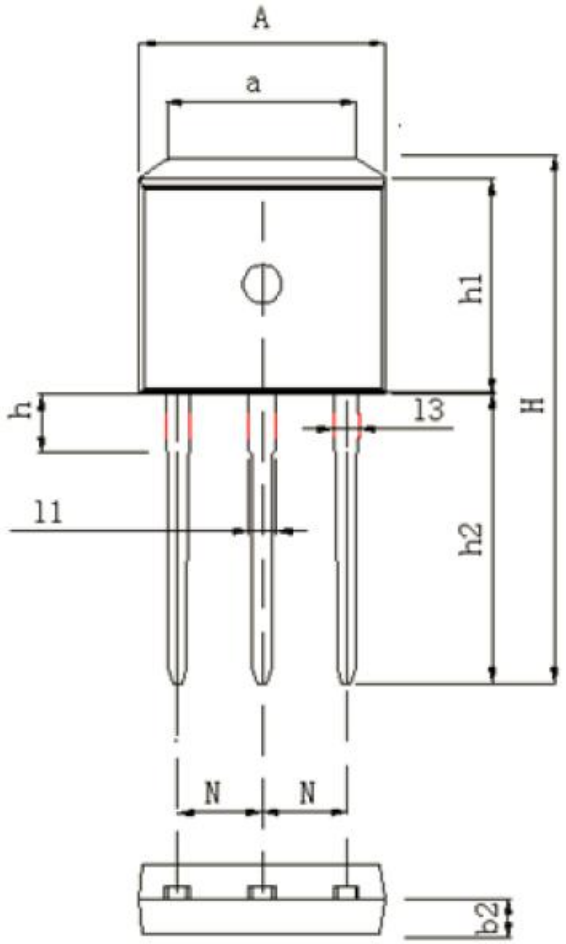
DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5(deep 0.2)

Unit :mm

Outline Dimension

Unit: mm

TO-262



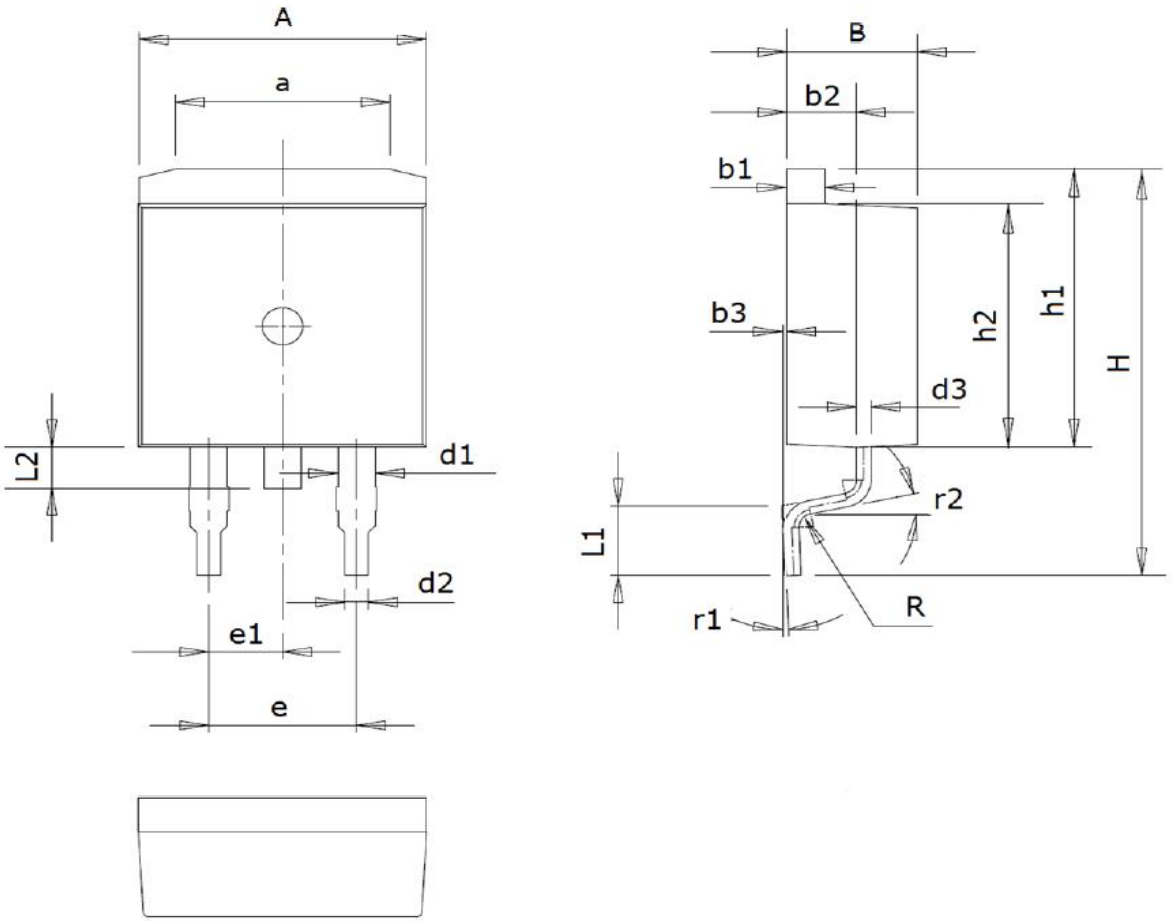
DIM	MILLIMETERS
A	9.98±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	23.9±0.3
h	3.1±0.2
h1	9.16±0.2
h2	13.2±0.2
L	0.5±0.1
l1	1.3±0.1
l2	0.8±0.1
N	2.45±0.1

Unit :mm

Outline Dimension

Unit: mm

TO-263



Symbol	Dimensions （mm）	Symbol	Dimensions (mm)	Symbol	Dimensions (mm)
A	9.6～10.0	d2	0.7～0.9	L1	2.4~2.9
a	7.0～7.8	d3	0.4～0.6	L2	1.3~1.8
B	4.3～4.7	e	5.08（typ）	R	0.5(typ)
b1	1.25～1.35	e1	2.54（typ）	r1	0~8°
b2	2.2～2.6	H	15.2~15.8	r2	12°（typ）
b3	0～0.2	h1	10.3~10.7		
d1	1.2～1.4	h2	9.1~9.4		