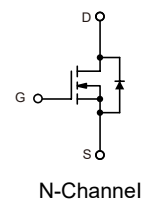
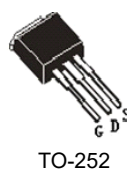
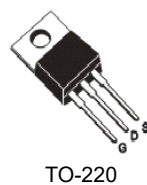


1.Features

- $V_{DS(V)}=650V$
- $I_D=5A$
- $R_{DS(ON)}=2\Omega$

2.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE



3.Absolute Maximum Ratings $T_c=25^{\circ}C$

Parameter		Symbol	Rating	Units
Drain-source Voltage		V_{DS}	650	V
gate-source Voltage		V_{GS}	± 30	V
Continuous Drain Current	$T_c=25^{\circ}C$	I_D	5	A
Continuous Drain Current	$T_c=100^{\circ}C$	I_D	3.15	A
Drain Current – Pulsed ①		I_{DM}	20	A
Power Dissipation		P_D	TO-220:120,TO-220FP:50	W
			TO-262/263:120	W
Junction Temperature		T_J	150	$^{\circ}C$
Storage Temperature		T_{STG}	-55 to 150	$^{\circ}C$
Single Pulse Avalanche Energy ②		E_{AS}	210	mJ



4.Thermal resistance rating

Parameter	Symbol	MAX			Units
		TO-220	TO-220FP	TO-262/263	
Thermal Resistance Junction-case	R_{thJC}	1.04	2.50	1.04	°C/W
Thermal Resistance Junction-ambient	R_{thJA}	62.5	62.5	62.5	°C/W



5. Electrical Characteristic (T_c=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	650			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		0.6		V/°C
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2		4	V
Drain-source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V, T _J =25°C			10	μA
		V _{DS} =480V, V _{GS} =0V, T _J =125°C			100	μA
Forward Transconductance	g _{fs}	V _{DS} =40V, I _D =2.5A ③		4		S
Gate-body Leakage Current (V _{DS} =0)	I _{GSS}	V _{GS} =±30V			±100	nA
Static Drain-source On Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2.5A ③		1.5	2	Ω
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1MHz		730		pF
Output capacitance	C _{oss}			25		pF
Reverse transfer capacitance	C _{rss}			16		pF
Turn -Off Delay Time	t _{D(off)}	V _{DD} =300V, I _D =5A, R _G =25Ω ③		38		ns
Total Gate Charge	Q _g	I _D =5A, V _{DS} =480V, V _{GS} =10V ③		15		nC
Gate-to-Source Charge	Q _{gs}			3.7		nC
Gate-to-Drain Charge	Q _{gd}			4.8		nC
Continuous Diode Forward Current	I _S				5	A
Diode Forward Voltage	V _{SD}	T _J =25°C, I _S =5A, V _{GS} =0V ③			1.4	V
Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =5A		270		ns
Reverse Recovery Charge	Q _{rr}	di/dt=100A/μs ③		1.9		uC

Notes:

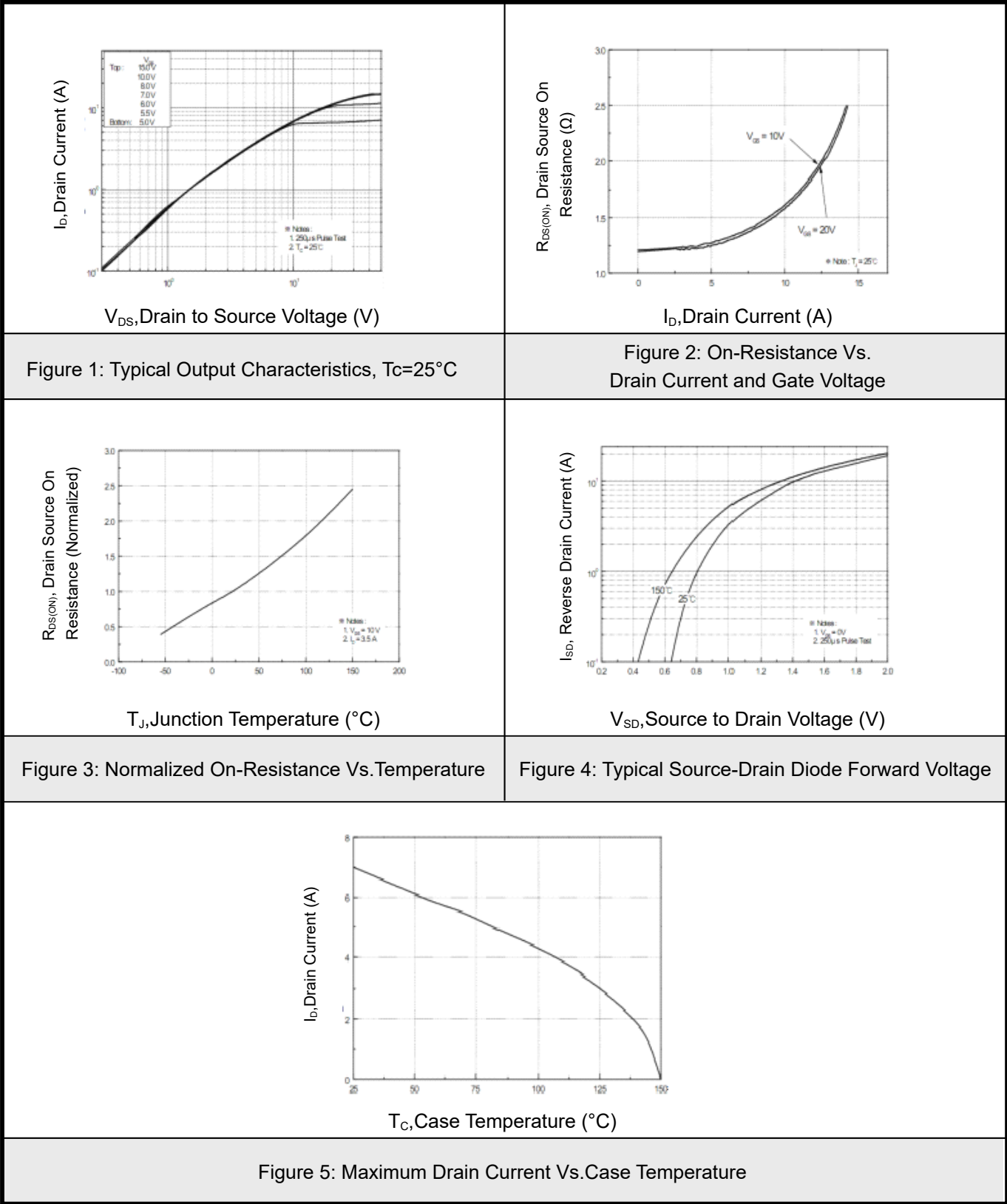
① Repetitive rating: Pulse width limited by maximum junction temperature.

② Starting T_J=25°C, V_{DD}=50V, L=18.9mH, R_G=25Ω, I_{AS}=5A.

③ Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.

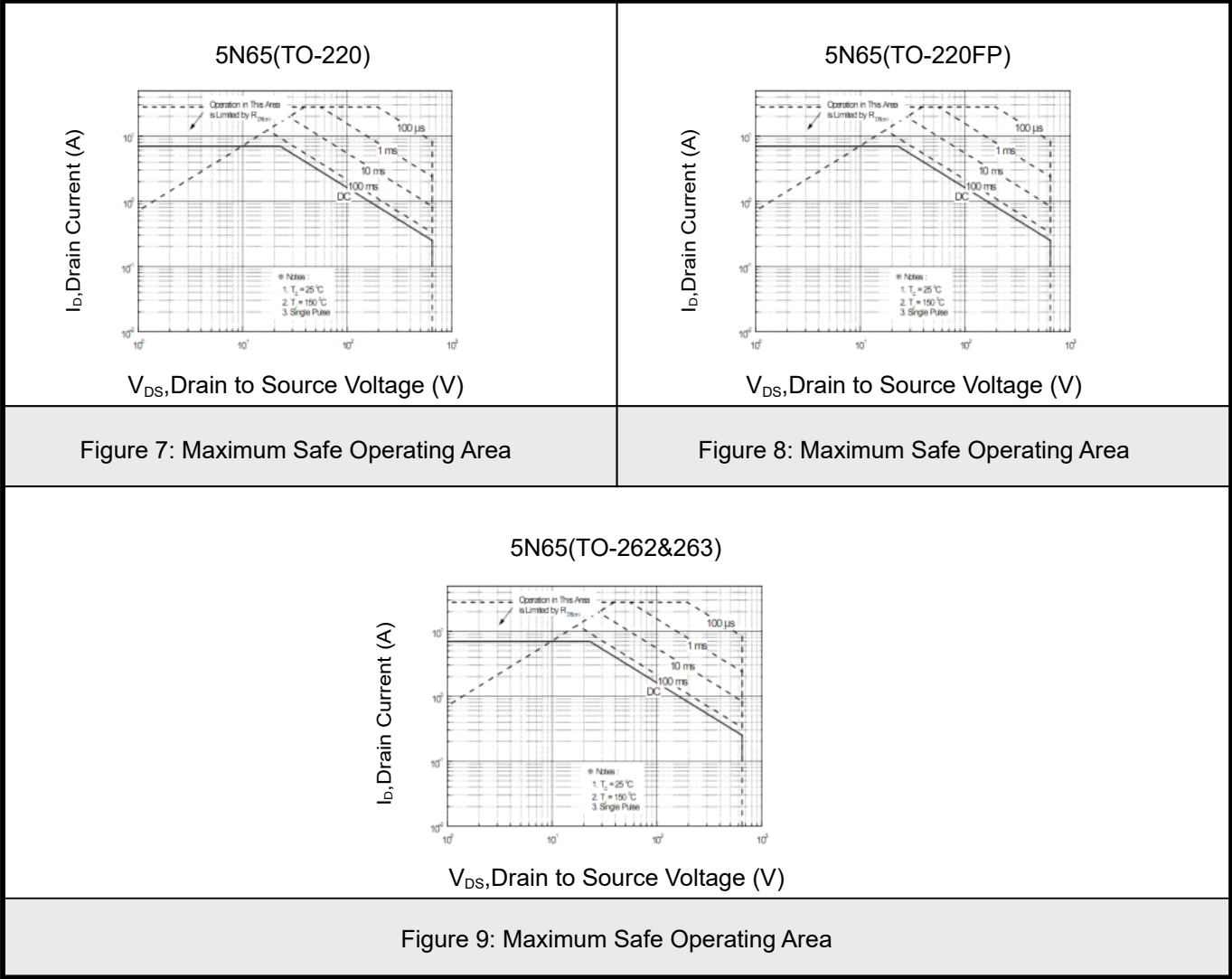


6.1Typical characteristic



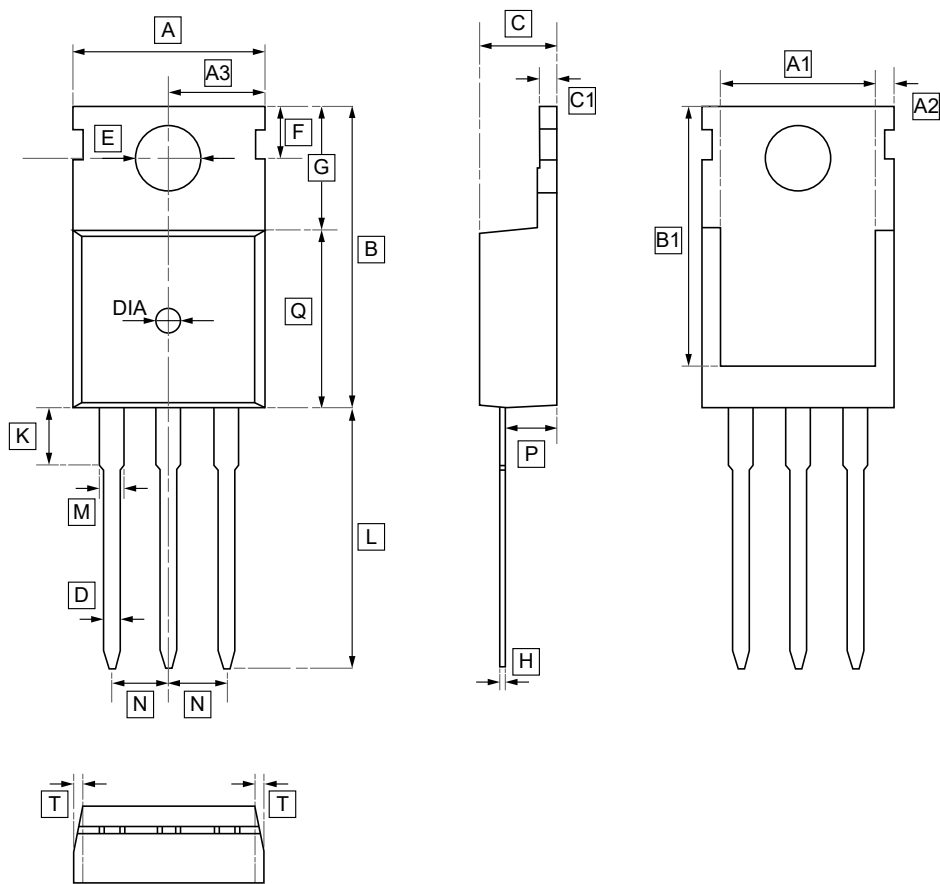


6.2Typical characteristic





7.1 TO-220 Package Outline Dimensions



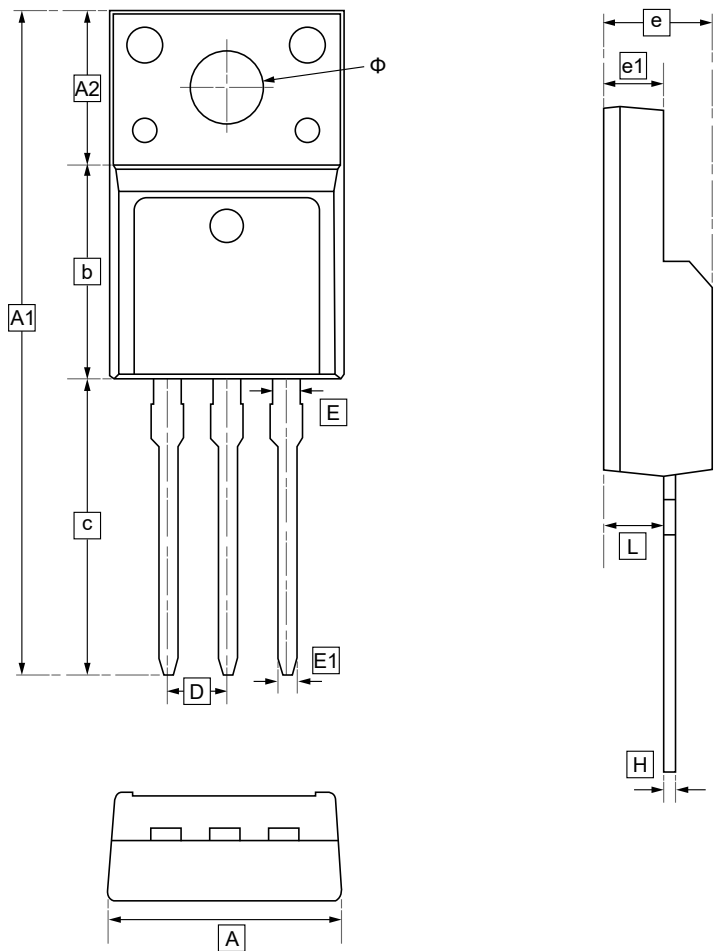
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	C	C1	D	E	F	G
Min	9.7	8.44	1.05	4.8	15.4	12.9	4.28	1.1	0.6	3.4	2.65	5.2
Max	10.3	8.84	1.25	5.2	16.2	13.5	4.68	1.5	1.0	3.8	3.25	5.8

Symbol	H	K	L	L1	M	N	P	Q	T	DIA
Min	0.4	2.9	12.8	2.7	1.15	2.49	2.1	8.7	W:0.35	⌀1.5
Max	0.6	3.3	13.6	3.3	1.35	2.59	2.7	9.3		(deep 0.2)



7.2 TO-220F Package Outline Dimensions



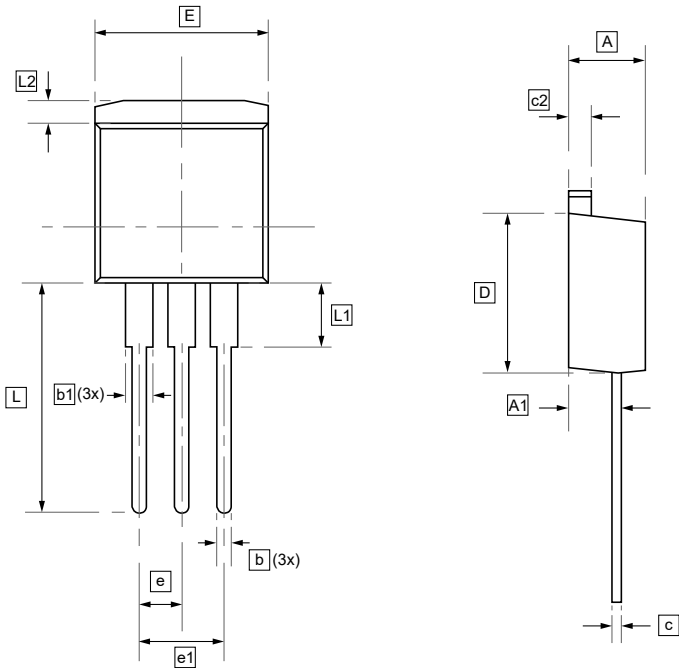
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	Φ	e	e1	L
Min	10.00	28.80	6.58	9.12	12.95	2.54	1.15	0.75	3.13	4.50	2.40	2.50
Max	10.20	29.20	6.78	9.32	13.25		1.25	0.85	3.23	4.70	2.60	2.70

Symbol	H
Min	0.45
Max	0.55



7.3 TO-262 Package Outline Dimensions

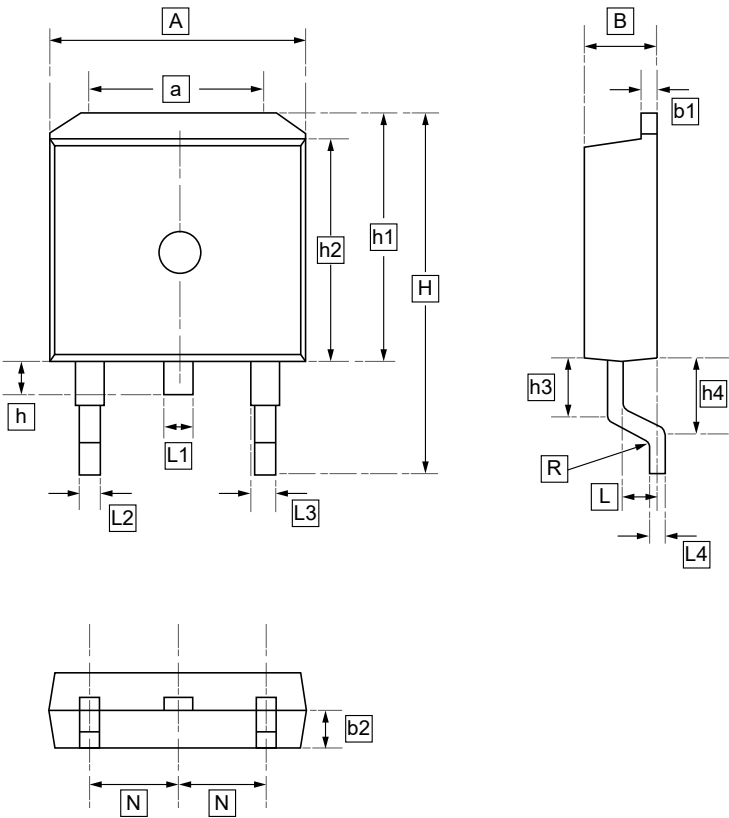


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	b	b1	c	c2	D	e	e1	E	L	L1	L2
Min	3.80	2.00	0.60	1.20	0.40	1.10	-	-	-	9.90	12.50	0.80	-
Max	4.80	2.80	1.00	1.40	0.70	1.40	9.60	-	5.30	10.70	14.50	1.20	1.50



7.4 TO-263 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	a	B	b1	b2	H	h	h1	h2	h3	h4	L	L1	L2	L3
Min	9.6	7.2	4.3	1.25	2.2	15.2	1.34	10.3	9.1	1.34	2.5	2.2	1.2	0.7	1.2
Max	10.0	7.6	4.7	1.35	2.6	15.8	1.74	10.7	9.3	1.74	2.9	2.6	1.4	0.9	1.4

Symbol	L4	N	R
Min	0.4	2.4	0.45
Max	0.6	2.5	0.55



8.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW 5N65F	TO-220F	1000	Tape and box



9.Disclaimer

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