

650V 0.8A 17Ω N-ch Power MOSFET

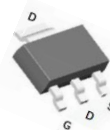
Description

DT2 MOS is DIN-TEK 2nd generation VDMOS family that is dramatic reduction in on-resistance and ultra-low gate charge for applications requiring high power density and high efficiency. And it is very robust and RoHS compliant.

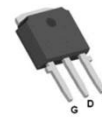
TO-252



SOT-223-3L



TO-251-L4.0

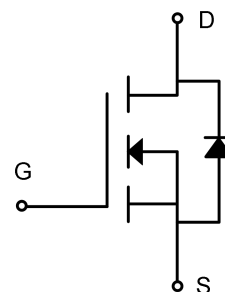


Features

- Typ. $R_{DS(on)}=17\Omega@V_{GS}=10V$
- 100% avalanche tested
- RoHS Compliant

Applications

- SMPS
- Charger
- DC-DC



Absolute Maximum Ratings ($T_c=25^{\circ}C$)

Parameter	Symbol	DTU08N65/DTL08N65	DTB08N65	Unit
Drain-source voltage	V_{DSS}	650		V
Gate-source voltage	V_{GS}	± 30		V
Continuous drain current	I_D	0.8		A
Pulsed drain current ¹	I_{DM}	3.2		A
Avalanche energy, single pulse ²	E_{AS}	28		mJ
Power dissipation	P_D	26	-	W
Derate above 25°C		0.2	-	W/°C
Operating junction temperature	T_j	-55~150		°C
Storage temperature	T_{stg}	-55~150		°C
Continuous diode forward current	I_S	0.8		A
Diode pulse current ¹	I_{Spulse}	3.2		A
Thermal resistance,junction-to-case	$R_{\theta JC}$	4.5	-	°C/W
Thermal resistance,junction-to-ambient	$R_{\theta JA}$	62	-	°C/W

Electrical Characteristics of MOSFET

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source break down voltage	BV_{DSS}	$I_D=250\mu A$, $V_{GS}=0V$, $T_J=25^\circ C$	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu A$, $V_{DS}=V_{GS}$, $T_J=25^\circ C$	2	-	4	V
Drain-source leakage current	I_{DSS}	$V_{DS}=650V$, $V_{GS}=0V$, $T_J=25^\circ C$	-	-	1	μA
		$V_{DS}=520V$, $V_{GS}=0V$, $T_J=125^\circ C$	-	-	100	μA
Gate-source leakage current,forward	I_{GSSF}	$V_{DS}=0V$, $V_{GS}=30V$, $T_J=25^\circ C$	-	-	100	nA
Gate-source leakage current,reverse	I_{GSSR}	$V_{DS}=0V$, $V_{GS}=-30V$, $T_J=25^\circ C$	-	-	-100	nA
Drain-source on-state resistance ³	$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=0.4A$, $T_J=25^\circ C$	-	17	19.5	Ω

Dynamic Characteristics of MOSFET ($T_C=25^\circ C$)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$f=1MHz$, $V_{DS}=25V$, $V_{GS}=0V$	-	137	-	pF
Output capacitance	C_{oss}		-	8.7	-	pF
Reverse transfer capacitance	C_{rss}		-	0.8	-	pF
Gate to source charge	Q_{gs}	$V_{DD}=350V$	-	0.5	-	nC
Gate to drain charge	Q_{gd}	$I_D=0.8A$	-	1.1	-	nC
Total gate charge	Q_g	$V_{GS}=0$ to 10V	-	4.3	-	nC

Switching Characteristics of MOSFET ($T_C=25^\circ C$)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Turn-on delay time	$t_{d on}$	$V_{DS}=350V$, $I_D=0.8A$, $R_G=25\Omega$, $V_{GS}=0$ to 10V	-	4.8	-	ns
Rise time	t_r		-	6	-	ns
Turn-off delay time	$t_{d off}$		-	10.8	-	ns
Fall time	t_f		-	18	-	ns

Characteristics of Body Diode ($T_C=25^\circ C$)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Forward voltage	V_{SD}	$I_{SD}=0.8A$, $V_{GS}=0V$	-	-	1.5	V
Reverse recovery time	t_{rr}	$V_{DS}=50V$, $I_S=0.8A$, $V_{GS}=10V$ $-di/dt=100A/\mu s$	-	650	-	ns
Reverse recovery current	I_{rr}		-	0.7	-	A
Recovery charge	Q_{rr}		-	0.22	-	μC

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ C$.
2. The E_{AS} data shows Max. rating . The test condition is $V_{DD}=50V$, $V_{GS}=10V$, $L=1mH$, $I_{AS}=7.5A$, $T_C=25^\circ C$.
3. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS

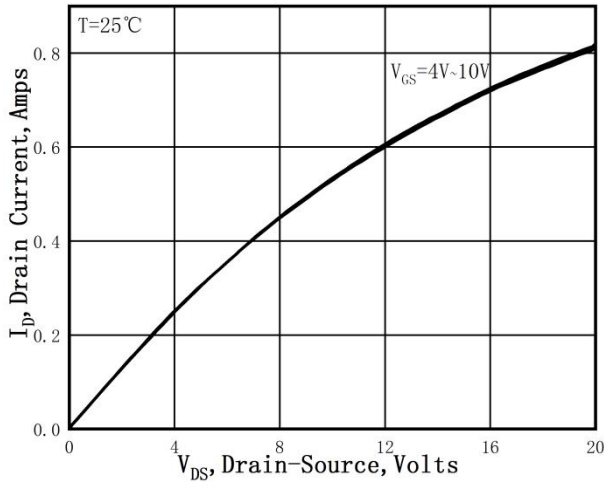


Figure 1. On-Region Characteristics

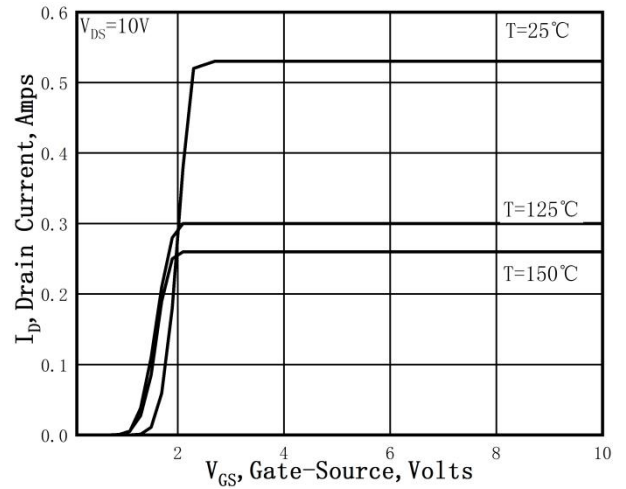


Figure 2. Transfer Characteristics

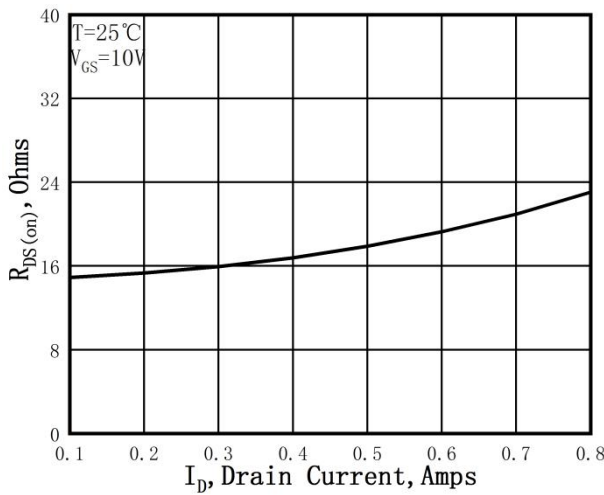


Figure 3. Static Drain-Source On Resistance

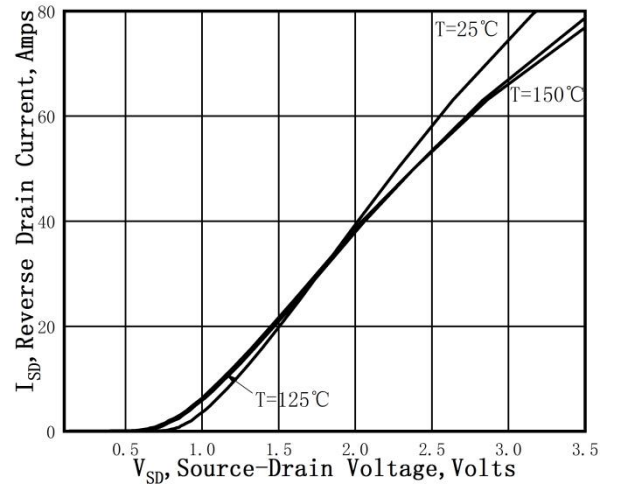


Figure 4. Typical Body Diode Transfer Characteristics

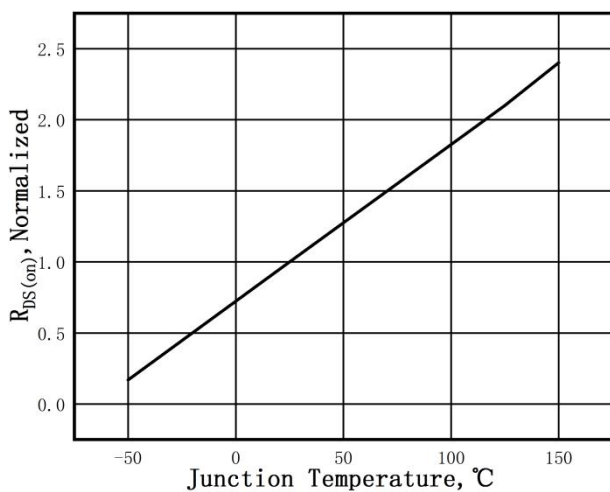


Figure 5. Normalized $R_{DS(on)}$ vs. Temperature

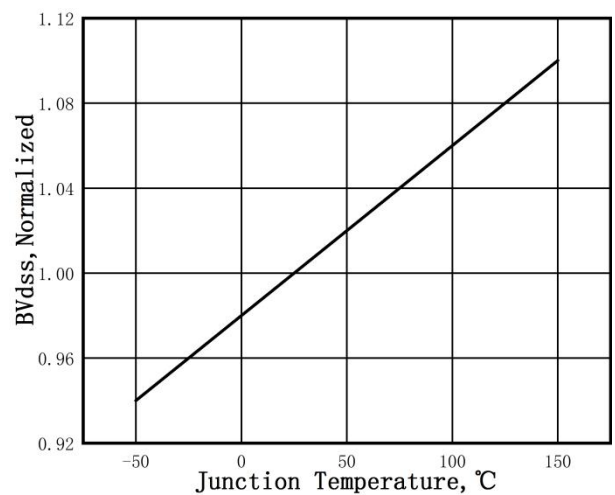


Figure 6. Normalized BV_{DSS} vs. Temperature

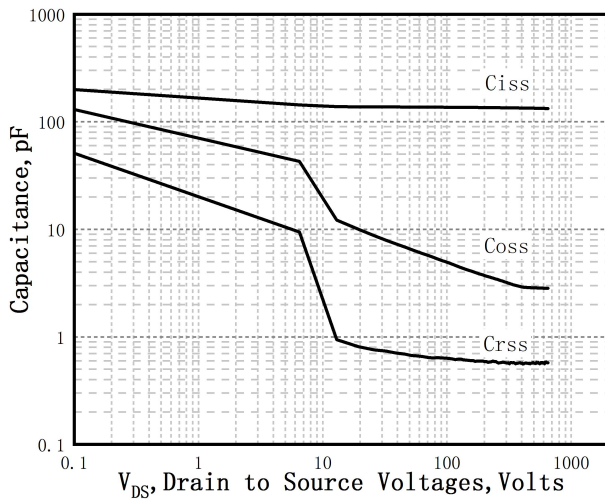


Figure 7. Capacitance Characteristics

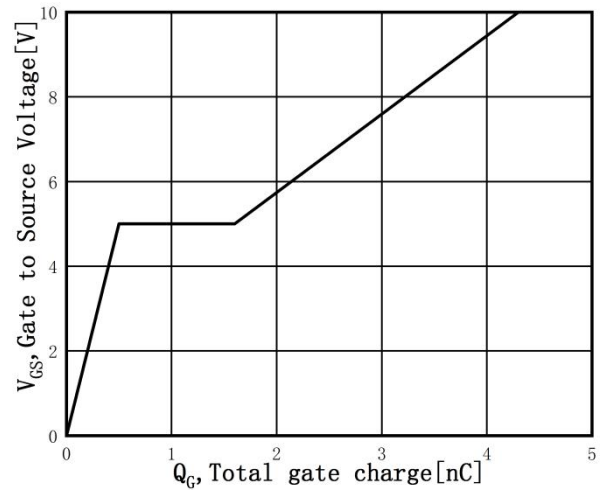


Figure 8. Gate Charge Characteristics

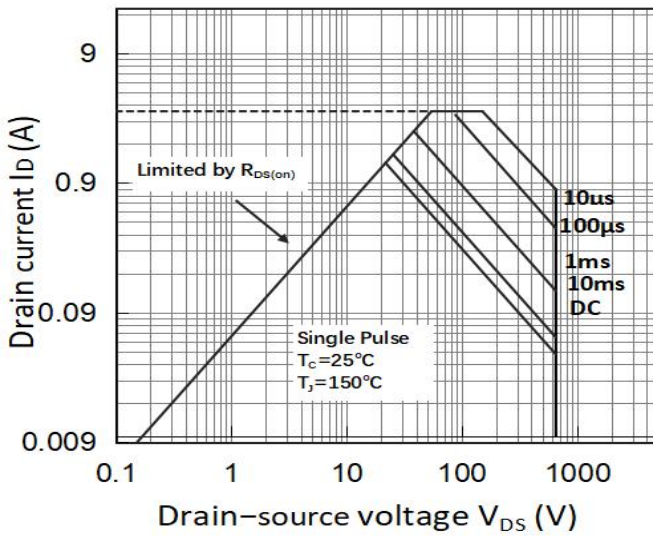


Figure 9. Maximum Safe Operating Area (TO-252/TO-251-L4.0)

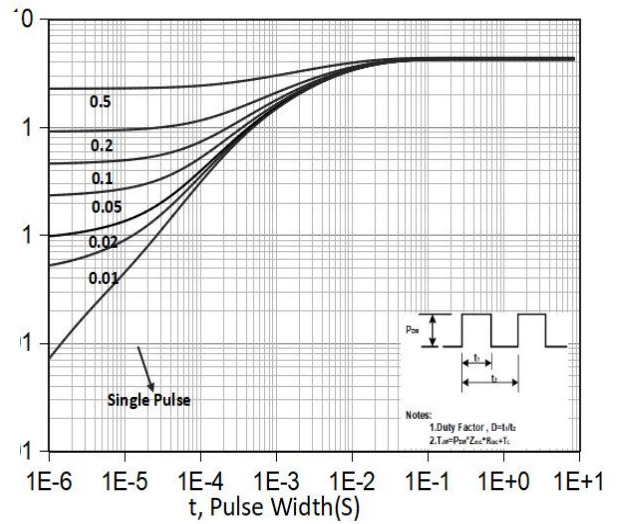
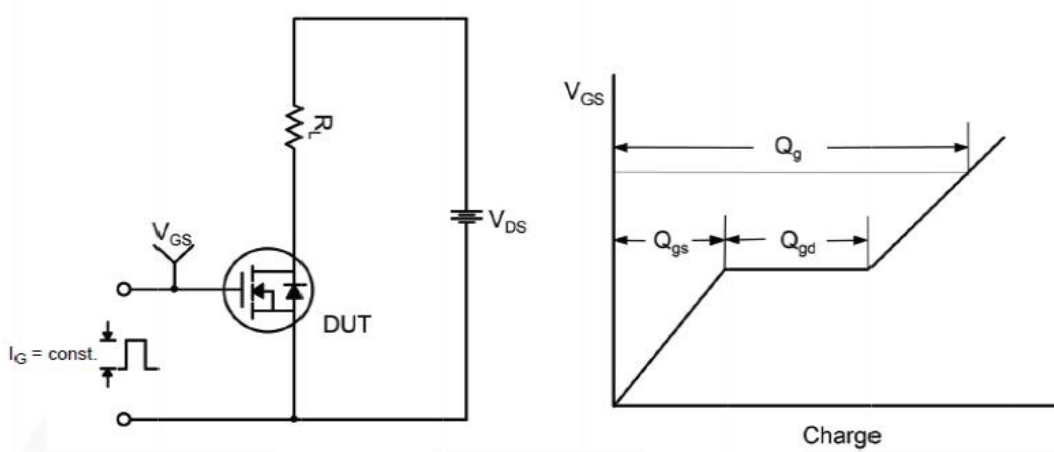
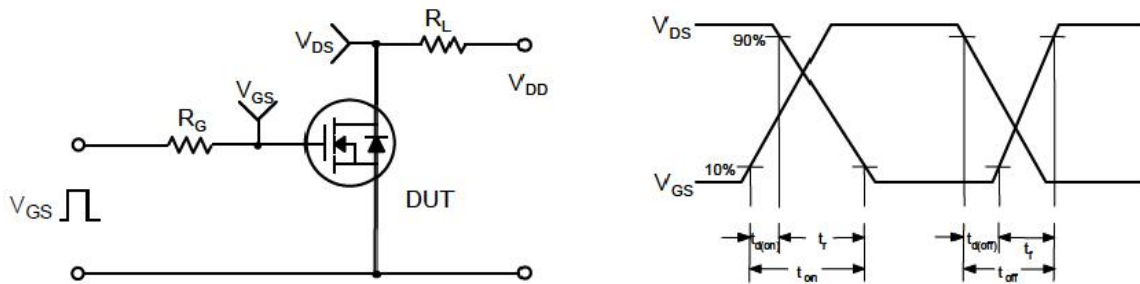


Figure 10. Transient Thermal Response Curve (TO-252/TO-251-L4.0)

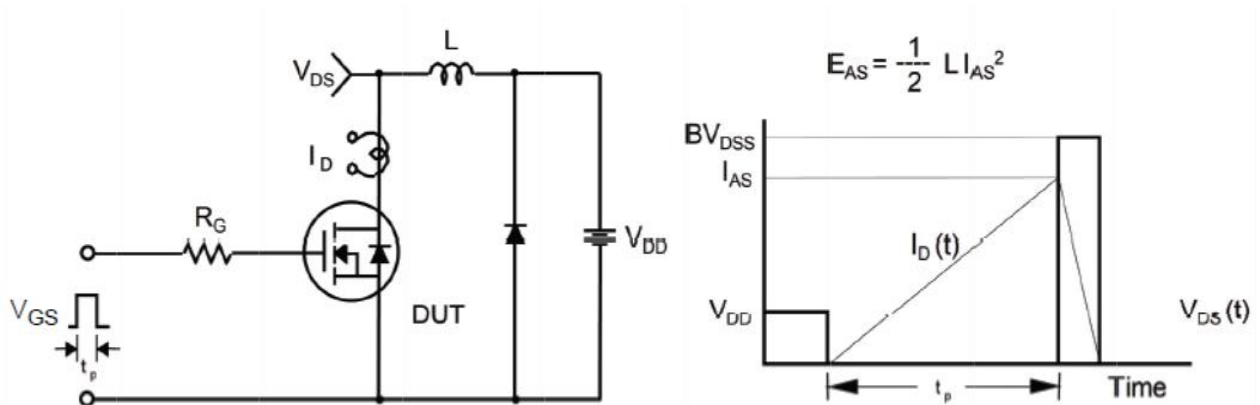
Gate Charge Test Circuit & Waveform



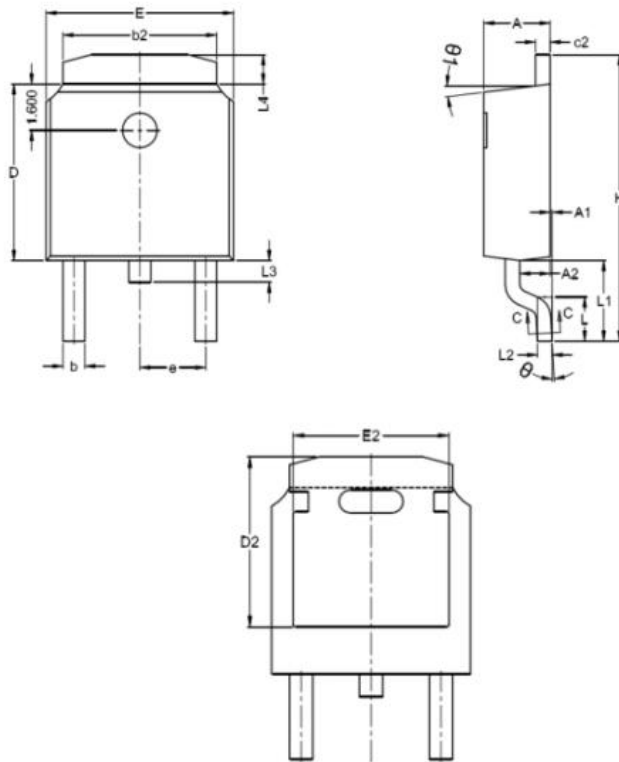
Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



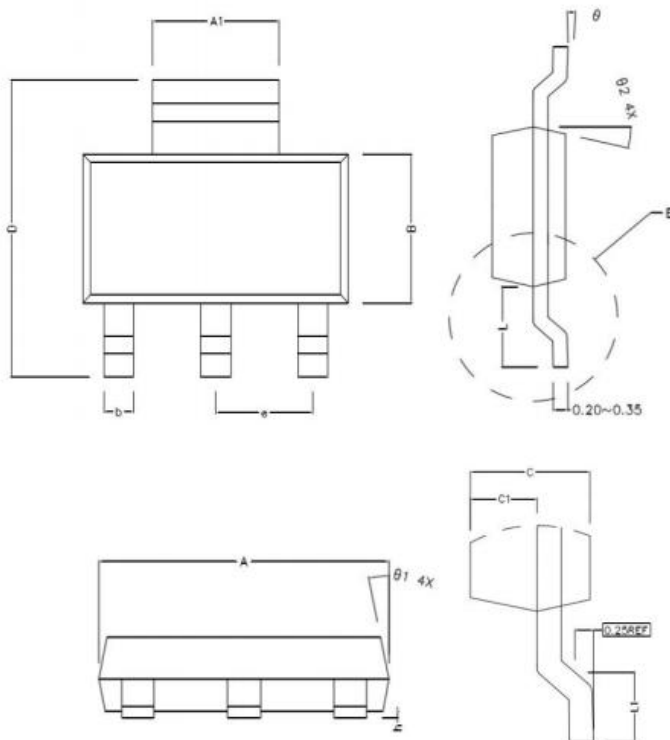
Mechanical Dimensions for TO-252



COMMON DIMENSIONS

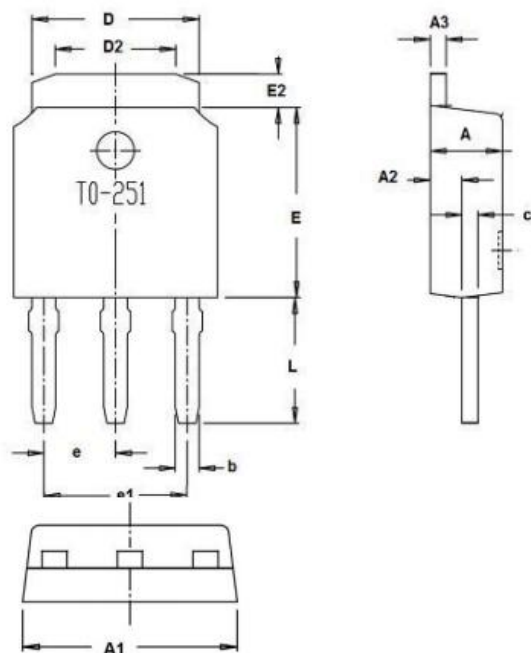
SYMBOL	MM	
	MIN	MAX
A	2.10	2.50
A1	0	0.15
b	0.7	0.9
b2	5.13	5.54
c	0.44	0.65
c2	0.45	0.65
D	6.00	6.20
D2	5.37	5.78
E	6.30	6.90
E2	4.90	5.30
e	2.23	2.33
H	9.7	10.5
L	1.38	1.73
L1	2.58	3.00
L2	0.50	0.52
L3	0.60	1.00
L4	0.81	1.42

Mechanical Dimensions for SOT-223-3L



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	6.3	6.7
A1	2.9	3.1
B	3.3	3.7
C	1.55	1.8
D	6.7	7.3
L	1.65	1.85
L1	0.81	1.15
b	0.66	0.84
h	0.02	0.1
e	2.3TYPE	



COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	2.15	2.45
A1	6.3	6.9
A2	0.9	1.1
A3	Typ0.5	
b	0.75	0.86
c	0.9	1.1
D	5.33	5.53
D2	3.65	4.05
E	6.00	6.20
E2	0.91	1.36
e	Typ2.29	
e1	Typ4.58	
L	3.7	4.3

Ordering Information

Part	Package	Marking	Packing method	Minimum packing number
DTU08N65	TO-252	DTU08N65	Tape and reel	2.5K / Reel
DTB08N65	TO-223-3L	DTB08N65	Tape and reel	2.5K / Reel
DTL08N65	TO-251-L4.0	DTL08N65	Tube	80 / Tube

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