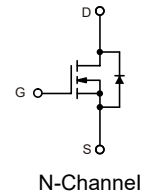
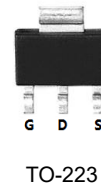
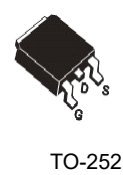
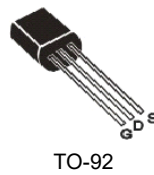


1.Features

- $V_{DS(V)}=600V$
- $I_D=1A$
- $R_{DS(ON)}=8.5\Omega$

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}	600	V
gate-source Voltage		V_{GS}	± 30	V
Continuous Drain Current	$T_c=25^{\circ}C$	I_D	1*	A
Continuous Drain Current	$T_c=100^{\circ}C$	I_D	0.6*	A
Drain Current - Pulsed ①		I_{DM}	4*	A
Power Dissipation ($T_A=25^{\circ}C$)	TO-92	P_D	12.5	W
	TO-223		8	W
	TO-251/251S/252		27	W
Junction Temperature		T_J	150	$^{\circ}C$
Storage Temperature		T_{STG}	-55 to 150	$^{\circ}C$
Single Pulse Avalanche Energy ②		E_{AS}	14	mJ

Notes: *Drain current limited by maximum junction temperature



4.Thermal resistance rating

Parameter	Symbol	Max		Units
		TO-92	TO-251T/251S/252/223	
Thermal Resistance Junction-lead	R_{thJL}	41.67	4.46	°C/W
Thermal Resistance Junction-ambient	R_{thJA}	140	110	°C/W



5. Electrical Characteristic ($T_c=25^\circ\text{C}$ unless otherwise noted)

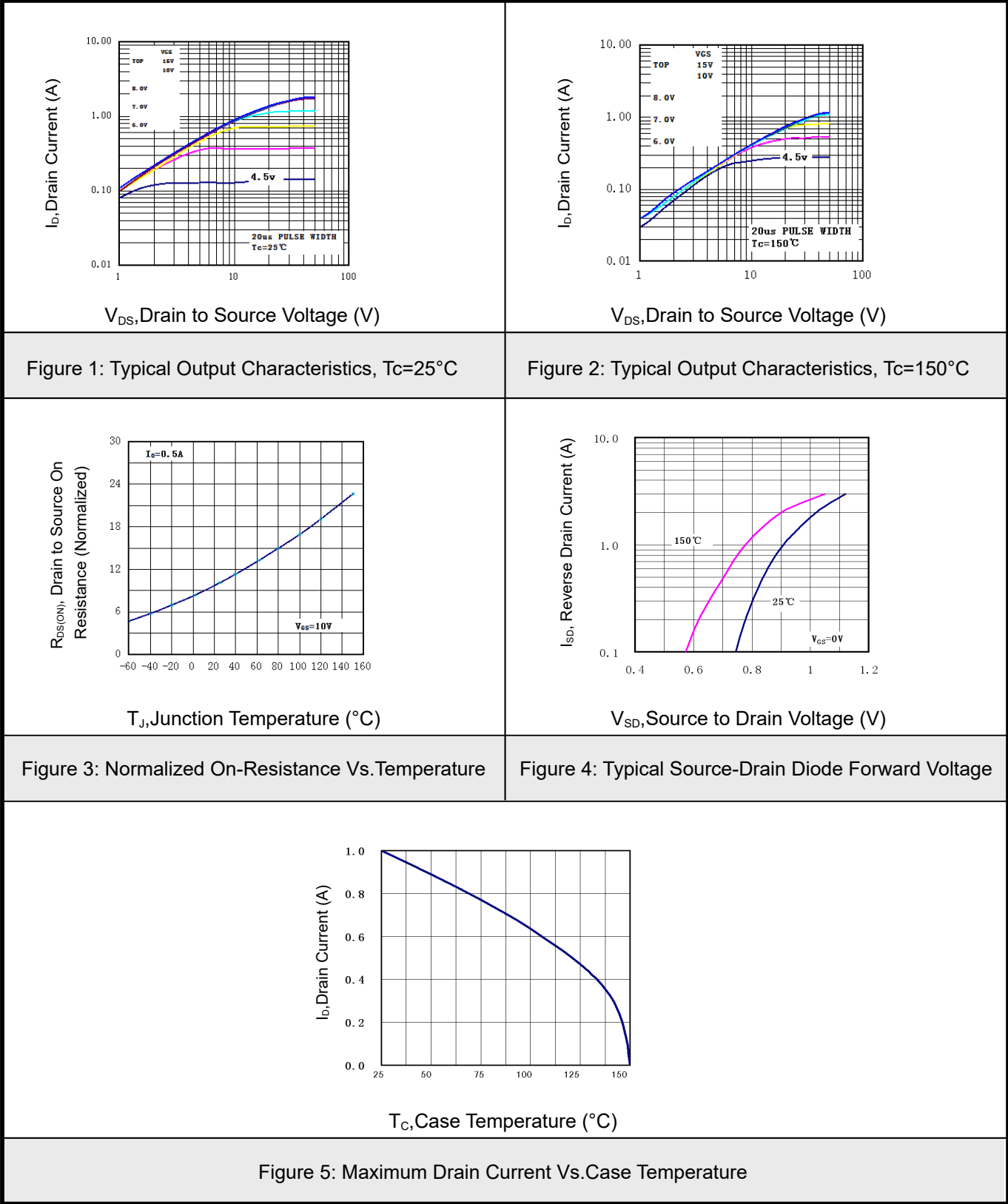
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	600			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D=250\mu A$ Referenced to 25°C		0.6		$V/^\circ\text{C}$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2		4	V
Drain-source Leakage Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V, T_J=25^\circ\text{C}$			1	μA
		$V_{DS}=480V, V_{GS}=0V, T_J=125^\circ\text{C}$			10	μA
Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=0.5A$ ③	0.5			S
Gate-body Leakage Current ($V_{DS}=0$)	I_{GSS}	$V_{GS}=\pm 30V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=0.5A$ ③		8.5	11	Ω
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=25V, f=1\text{MHz}$		150		pF
Output capacitance	C_{oss}			25		pF
Reverse transfer capacitance	C_{rss}			5.4		pF
Turn -Off Delay Time	$t_{D(off)}$	$V_{DD}=300V, I_D=1A, R_G=25\Omega$ ③		13		ns
Total Gate Charge	Q_g	$I_D=1A, V_{DS}=480V, V_{GS}=10V$ ③		4.8		nC
Gate-to-Source Charge	Q_{gs}			0.7		nC
Gate-to-Drain Charge	Q_{gd}			2.7		nC
Continuous Diode Forward Current	I_S				1	A
Diode Forward Voltage	V_{SD}	$T_J=25^\circ\text{C}, I_S=0.5A, V_{GS}=0V$ ③			1.4	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}, I_F=1A$		190		ns
Reverse Recovery Charge	Q_{rr}	$di/dt=100A/\mu s$ ③		0.53		nC

Notes:

- ① Repetitive rating: Pulse width limited by maximum junction temperature.
 ② $T_J=25^\circ\text{C}$, $V_{DD}=50V$, $L=30\text{mH}$, $R_G=25\Omega$, $I_{AS}=1.0A$, Starting $T_J=25^\circ\text{C}$, $V_{DD}=50V$, $L=30\text{mH}$, $R_G=25\Omega$, $I_{AS}=1A$.
 ③ Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

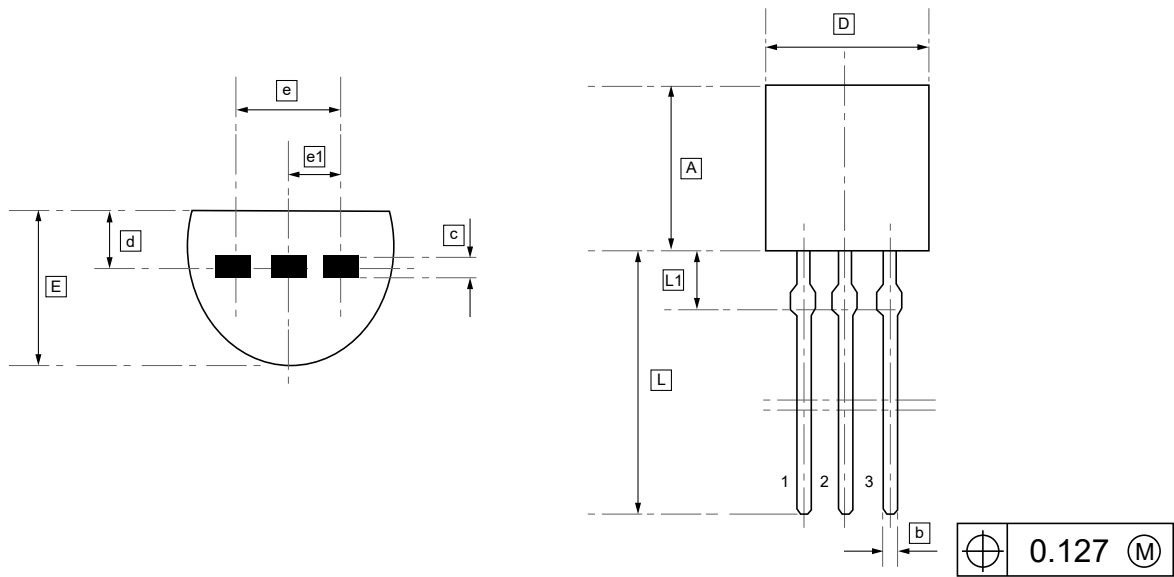


6. Typical Characteristic





7.1 TO-92 Package Outline Dimensions

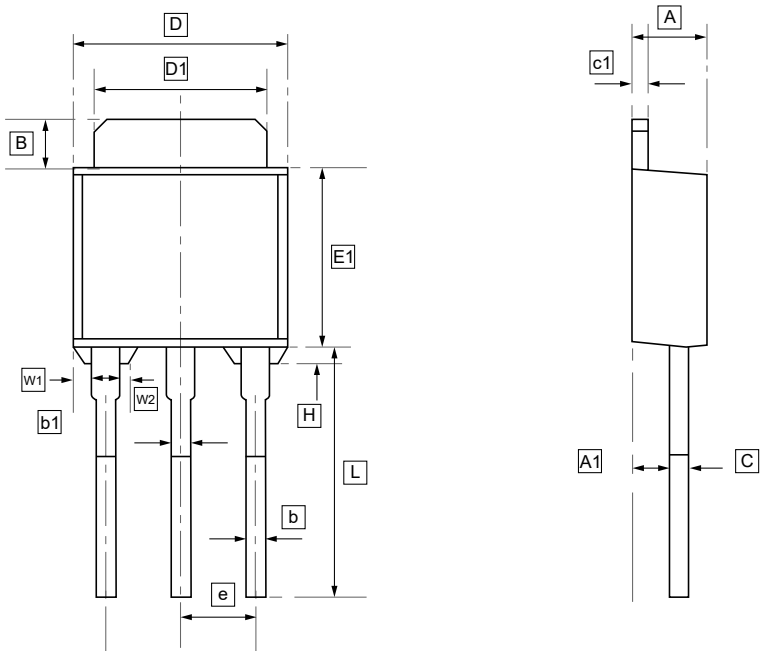


DIMENSIONS (mm are the original dimensions)

Symbol	A	b	c	D	d	E	e	e1	L	L1
Min	4.30	0.30	0.30	4.30	1.00	3.20	2.54	1.27	12.70	1.50
Max	5.30	0.55	0.50	5.20	1.70	4.20			15.00	2.00



7.2 TO-251T (IPAK) Package Outline Dimensions

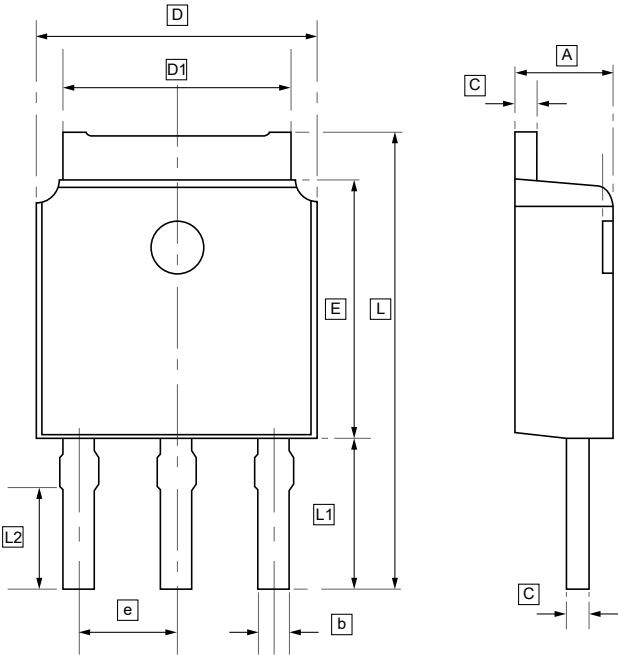


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	B	b	b1	c	c1	D	D1	E	e	L	H	W1	W2
Min	2.10	0.95	0.80	0.50	0.70	0.45	0.45	6.35	5.10	5.30	2.25	7.00	0.35	0.30	0.20
Max	2.50	1.30	1.25	0.80	0.80	0.70	0.70	6.80	5.50	6.30	2.35	9.20	0.45	0.50	0.40



7.3 TO-251S Package Outline Dimensions

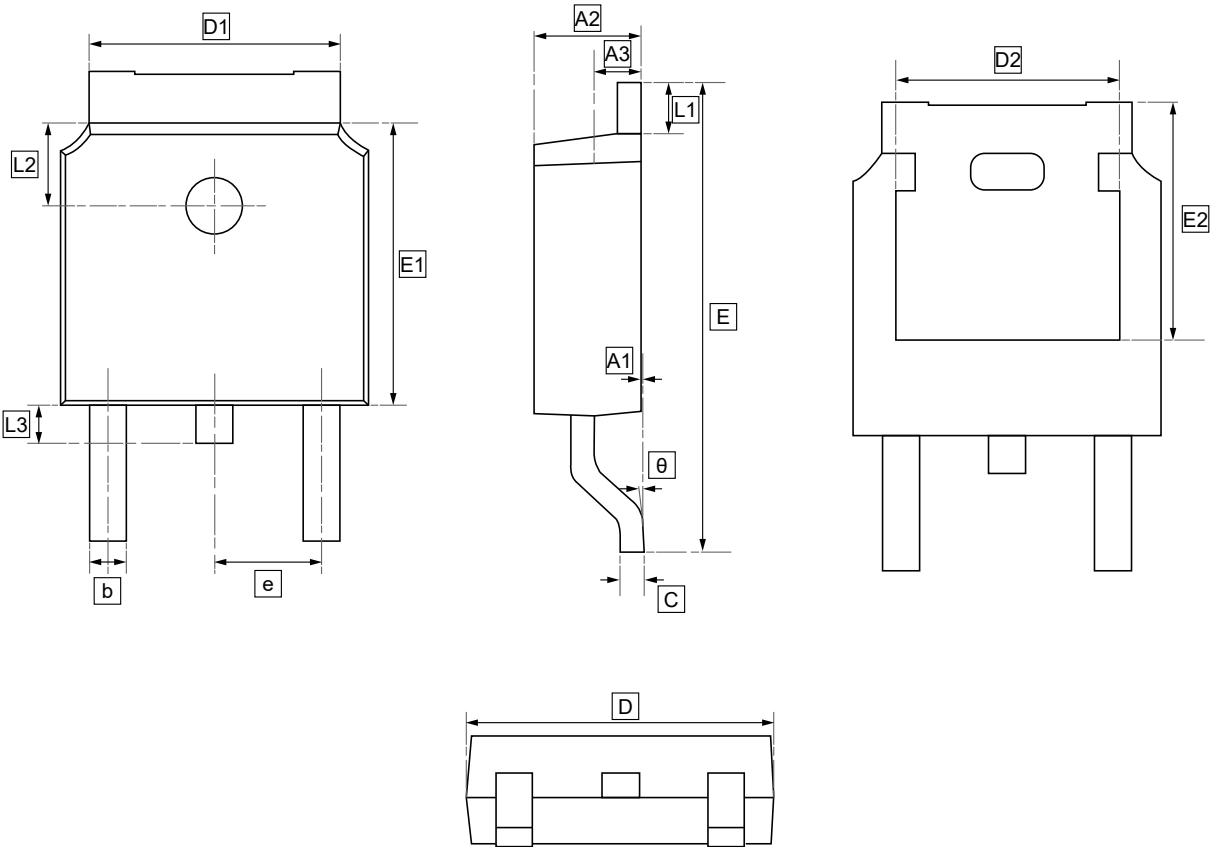


DIMENSIONS (mm are the original dimensions)

Symbol	A	b	C	D	D1	E	e	L	L1	L2
Min	2.20	0.60	0.45	6.50	5.10	5.9	2.18	11.00	4.8	3.5
Max	2.40	0.85	0.60	6.70	5.50	6.20	2.38	12.40	5.3	4.2



7.4 TO-252 Package Outline Dimensions

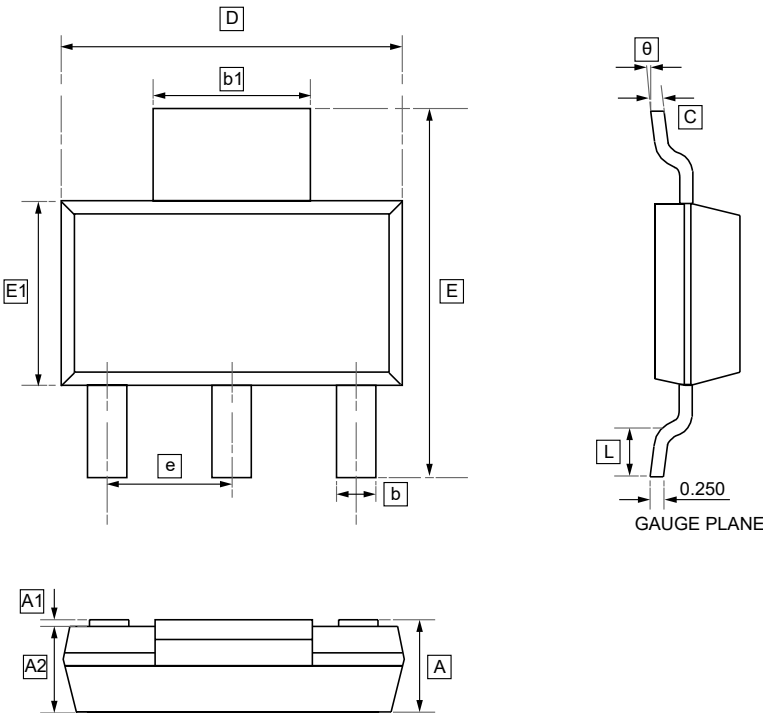


DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286 BSC	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38		1.27	1.90	1.00	8.00



7.5 SOT-223 Package Outline Dimensions

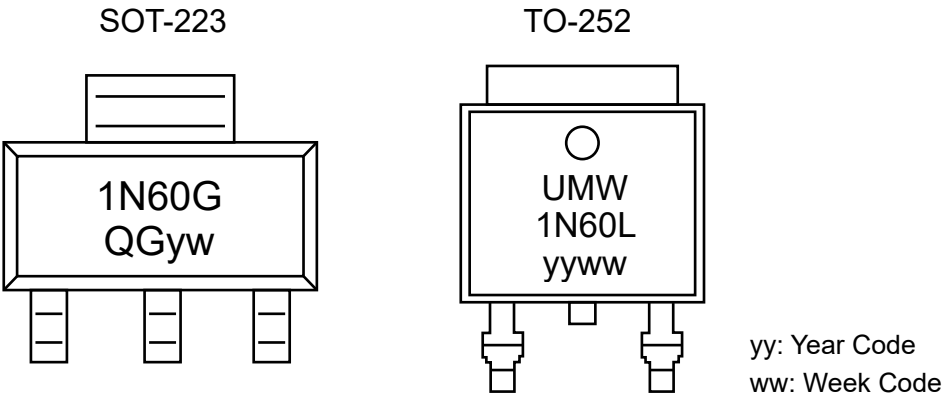


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	b1	c	D	E	E1	e	L	θ
Min	-	0.020	1.500	0.660	2.900	0.230	6.300	6.700	3.300	2.300	0.750	0°
Max	1.800	0.100	1.700	0.840	3.100	0.350	6.700	7.300	3.700	BSC	-	10°



8.Ordering Information



Order Code	Marking code	Package	Base QTY	Delivery Mode
UMW 1N60G	1N60G	SOT-223	2500	Tape and reel
UMW 1N60L	1N60L	TO-252	2500	Tape and reel



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