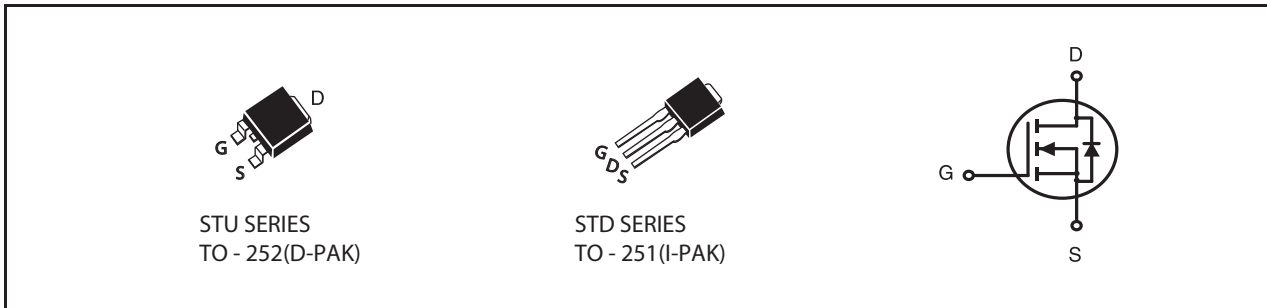


**600V N-Channel Planar MOSFET****PRODUCT SUMMARY**

V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
600V	1.5A	8 @ V <sub>GS</sub> =10V, I <sub>D</sub> =0.75A

**FEATURES**

- Low Cr<sub>ss</sub> (typical 3pF).
- Fast Switching.
- 100% Avalanche Rated.

**ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	600	V
V <sub>GS</sub>	Gate-Source Voltage	±30	V
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> =25°C	1.5
		T <sub>C</sub> =100°C	0.9
I <sub>DM</sub>	Pulsed Drain Current, V <sub>GS</sub> =10V <sup>a</sup>	6	A
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>b</sup>	48	mJ
dv/dt	Peak Diode Recovery Energy <sup>c</sup>	4.5	V/ns
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> =25°C	42
	Linear Derating Factor	T <sub>C</sub> >25°C	0.33
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to 150	°C

**THERMAL CHARACTERISTICS**

R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case	3	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient	50	°C/W

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## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	600			V
ΔV <sub>(BR)DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =250μA		0.6		V/°C
I <sub>DSS</sub>	Drain-to-Source Leakage Current	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V			20	μA
I <sub>GSSF</sub>	Gate-Body Leakage Current, Forward	V <sub>DS</sub> =0V, V <sub>GS</sub> =30V			100	nA
I <sub>GSSR</sub>	Gate-Body Leakage Current, Reverse	V <sub>DS</sub> =0V, V <sub>GS</sub> =-30V			-100	nA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =0.75A <sup>d</sup>			8	ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =15V, I <sub>D</sub> =0.75A <sup>d</sup>			10	S
<b>DYNAMIC CHARACTERISTICS</b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V f=1.0MHz		182		pF
C <sub>OSS</sub>	Output Capacitance			27		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			3		pF
<b>SWITCHING CHARACTERISTICS</b>						
t <sub>D(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =300V I <sub>D</sub> =1.5A R <sub>G</sub> =10 ohm, R <sub>D</sub> =200 ohm V <sub>GS</sub> =10V <sup>d</sup>		10		ns
t <sub>r</sub>	Turn-On Rise Time			29		ns
t <sub>D(off)</sub>	Turn-Off Delay Time			18		ns
t <sub>f</sub>	Turn-Off Fall Time			38		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =300V, I <sub>D</sub> =1.5A, V <sub>GS</sub> =10V <sup>d</sup>		6.7		nC
Q <sub>gs</sub>	Gate-Source Charge			1.0		nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge			3.8		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
I <sub>S</sub>	Maximum Continuous Source Current(Body Diode)				1.5	A
I <sub>SM</sub>	Maximum Pulsed Source Current(Body Diode)				6	A
V <sub>SD</sub>	Drain-Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1.5A <sup>d</sup>			1.5	V
<b>Notes :</b>						
a. Repetitive Rating : Pulse width limited by maximum junction temperature.						
b. V <sub>DD</sub> =50V, starting T <sub>J</sub> =25°C, L=43mH, R <sub>G</sub> =25Ω, I <sub>AS</sub> =1.5A						
c. I <sub>SD</sub> ≤ 1.5A, di/dt ≤ 100A/μs, V <sub>DD</sub> ≤ V <sub>(BR)DSS</sub> , T <sub>J</sub> ≤ 150°C						
d. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.						

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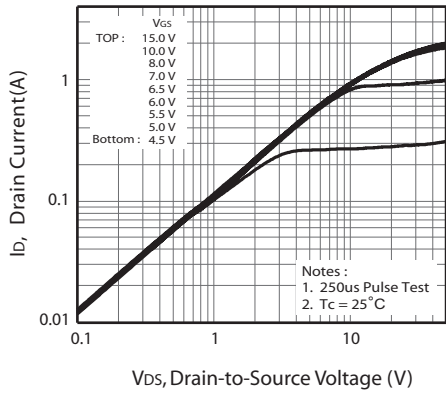


Figure 1. Output Characteristics

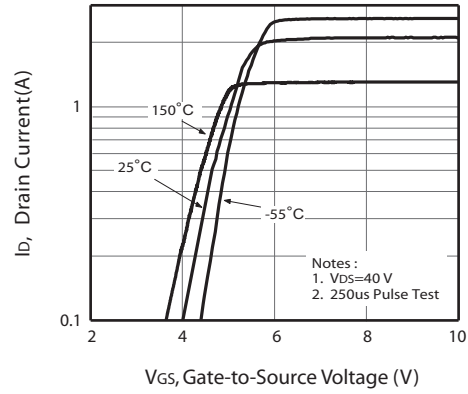


Figure 2. Transfer Characteristics

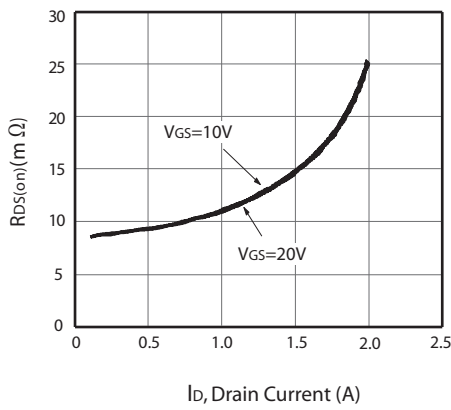


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

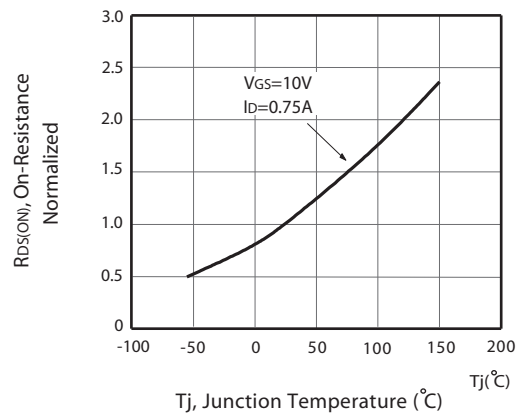


Figure 4. On-Resistance Variation with Drain Current and Temperature

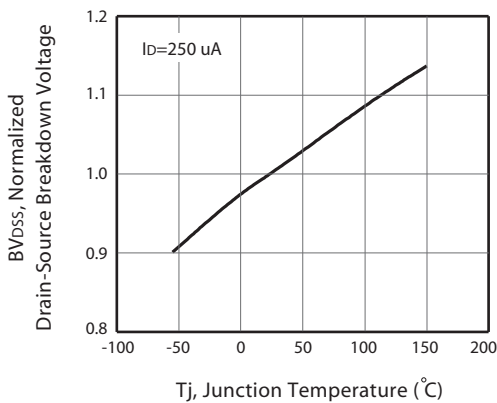


Figure 5. Breakdown Voltage Variation with Temperature

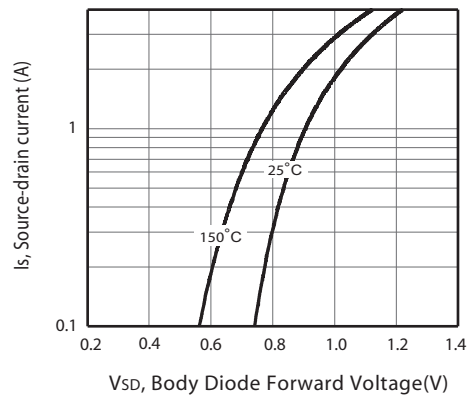


Figure 6. Body Diode Forward Voltage Variation with Source Current

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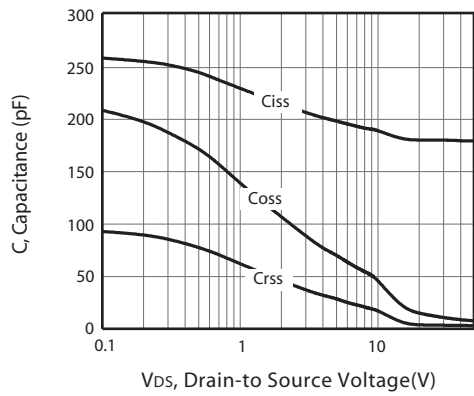


Figure 7. Capacitance

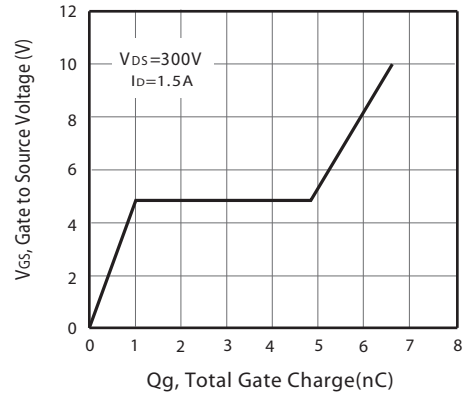


Figure 8. Gate Charge

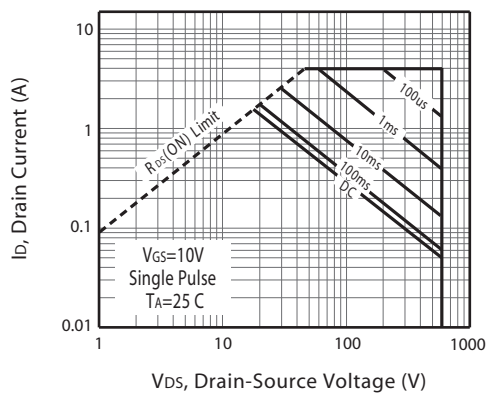
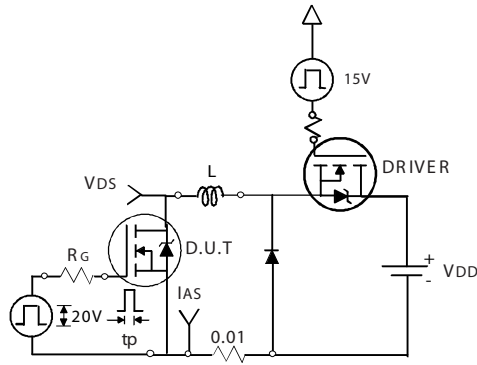


Figure 9. Maximum Safe Operating Area

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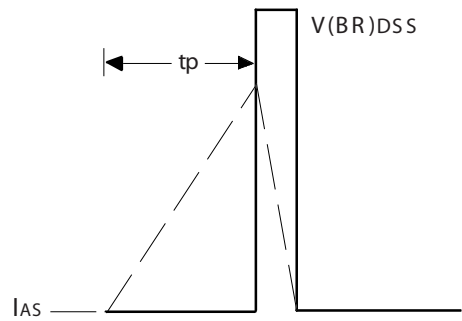
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Unclamped Inductive Test Circuit

Figure 10a.



Unclamped Inductive Waveforms

Figure 10b.

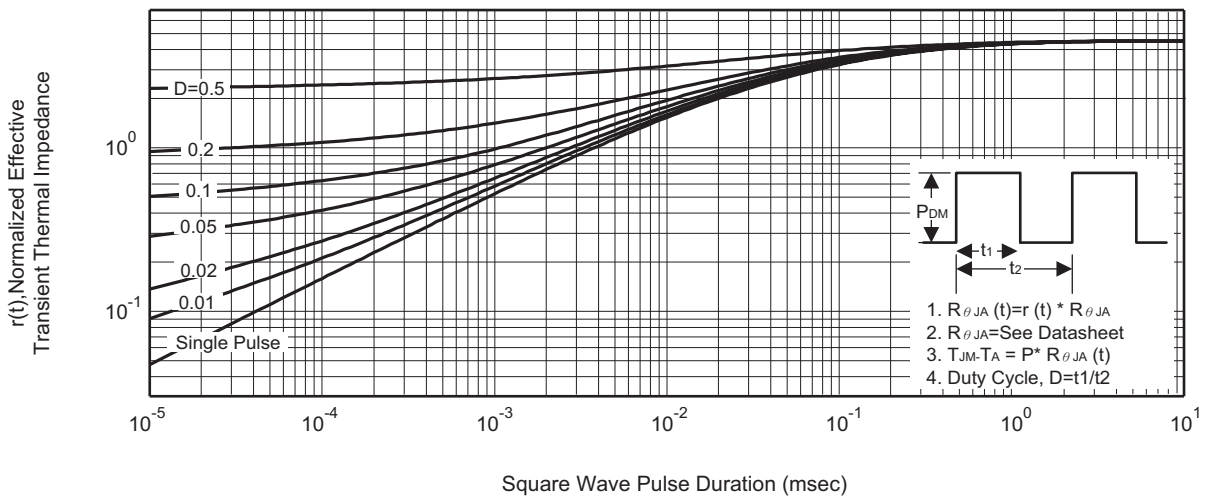


Figure 11. Normalized Thermal Transient Impedance Curve

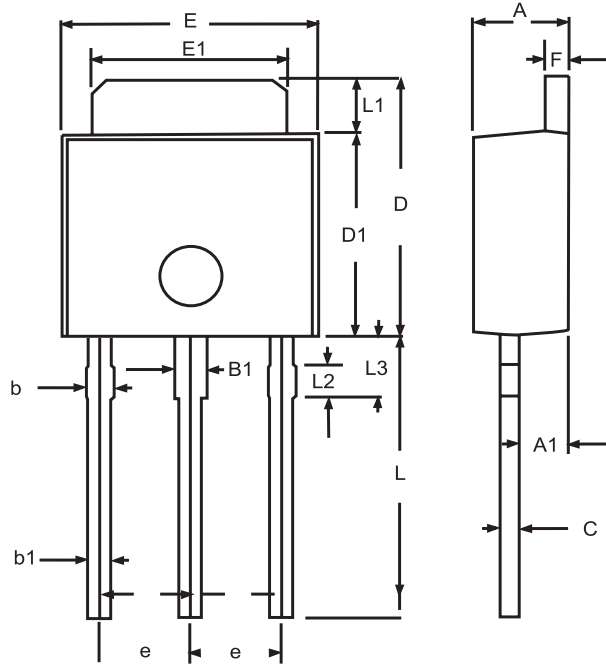
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## PACKAGE OUTLINE DIMENSIONS

TO-251

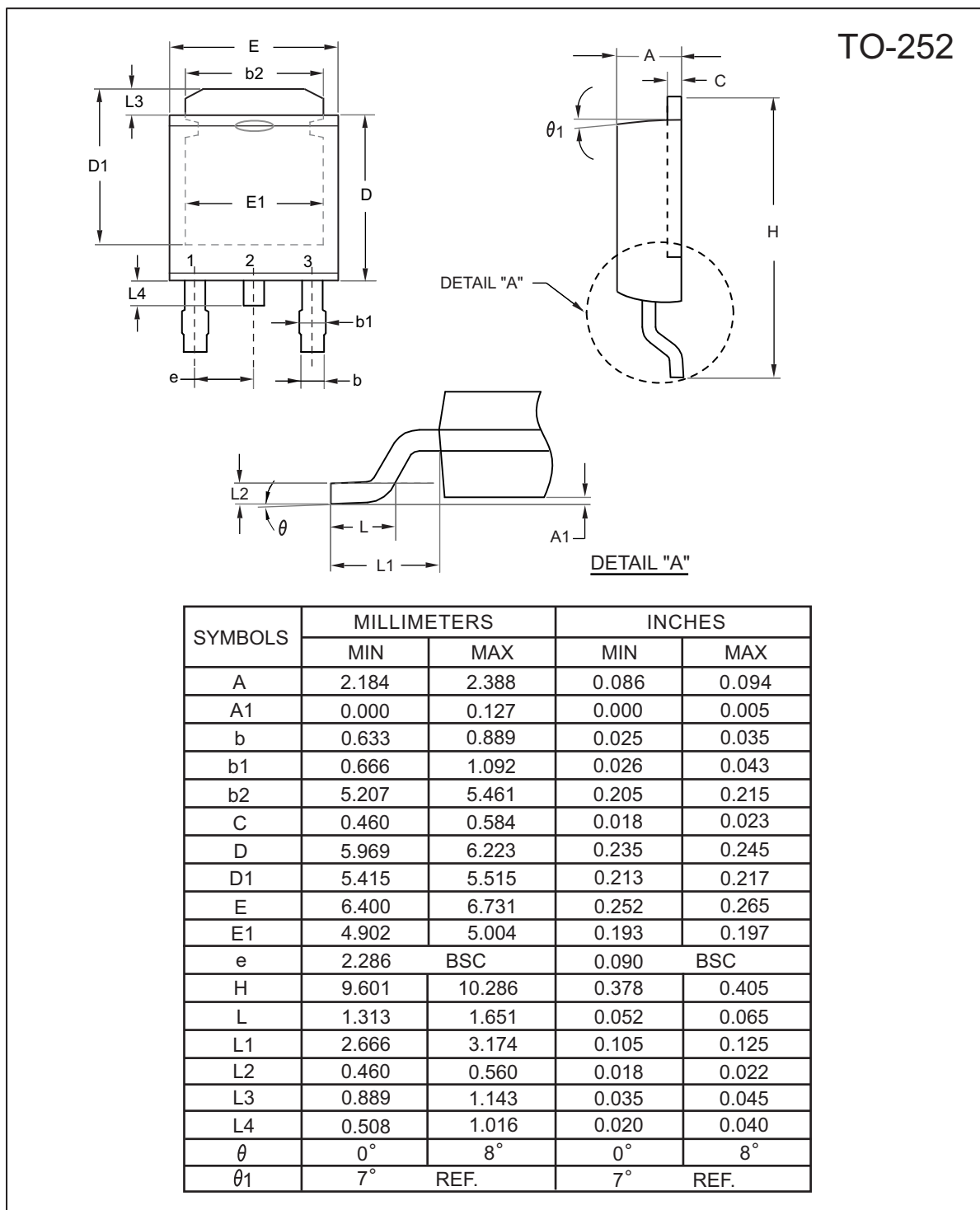


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.20	2.40	0.087	0.095
A1	1.100	1.300	0.043	0.051
B1	0.650	1.050	0.026	0.041
b	0.500	0.900	0.020	0.035
b1	0.400	0.800	0.016	0.32
C	0.400	0.600	0.016	0.024
D	6.700	7.300	0.264	0.287
D1	5.400	5.650	0.213	0.222
E	6.40	6.650	0.252	0.262
e	2.100	2.500	0.083	0.098
F	0.400	0.600	0.016	0.024
L	7.000	8.000	0.276	0.315
L1	1.300	1.700	0.051	0.067
L2	0.700	0.900	0.028	0.035
L3	1.400	1.800	0.055	0.071

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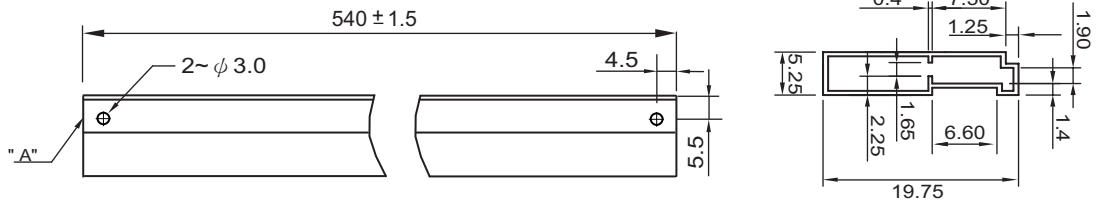
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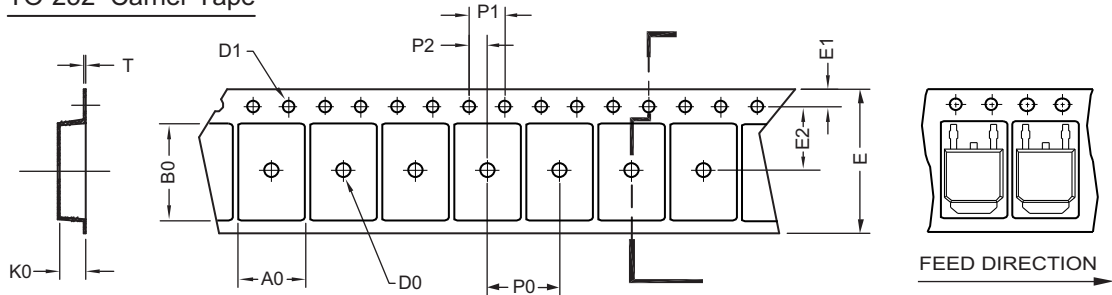
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## TO-251 Tube/TO-252 Tape and Reel Data

### TO-251 Tube



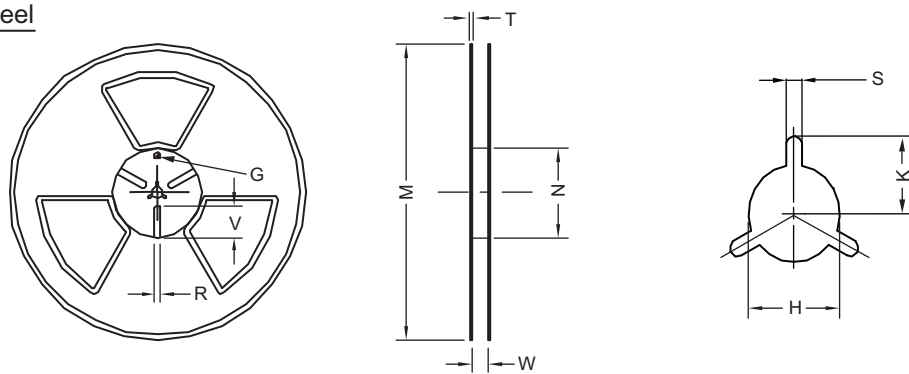
### TO-252 Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
TO-252 (16 mm)	6.96 ±0.1	10.49 ±0.1	2.79 ±0.1	φ2	φ1.5 +0.1 -0	16.0 ±0.3	1.75 ±0.1	7.5 ±0.15	8.0 ±0.1	4.0 ±0.1	2.0 ±0.15	0.3 ±0.05

### TO-252 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	T	H	K	S	G	R	V
16 mm	φ 330	φ 330 ±0.5	φ 97 ±1.0	17.0 +1.5 -0	2.2	φ 13.0 +0.5 -0.2	10.6	2.0 ±0.5	---	---	---