



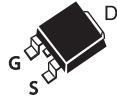
N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

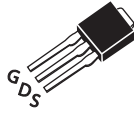
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
30V	87A	5.6 @ V _{GS} =10V
		9 @ V _{GS} =4.5V

FEATURES

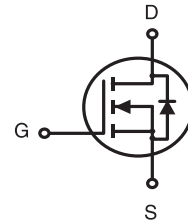
- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- TO-252 and TO-251 Package.



STU SERIES
TO-252AA(D-PAK)



STD SERIES
TO-251(I-PAK)



ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise noted)

Symbol	Parameter	Limit	Units
V _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current-Continuous ^c	T _C =25°C	87
		T _C =70°C	72.8
I _{DM}	-Pulsed ^{a c}	340	A
E _{AS}	Single Pulse Avalanche Energy ^d	132	mJ
P _D	Maximum Power Dissipation	T _C =25°C	75
		T _C =70°C	52.5
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 175	°C

THERMAL CHARACTERISTICS

R _{θJC}	Thermal Resistance, Junction-to-Case	2	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	50	°C/W

ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V , V _{GS} =0V			1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.0	1.6	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =27.5A		4.5	5.6	m ohm
		V _{GS} =4.5V , I _D =22A		6.6	9.0	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =27.5A		65		S
DYNAMIC CHARACTERISTICS ^b						
C _{ISS}	Input Capacitance	V _{DS} =15V,V _{GS} =0V f=1.0MHz		1550		pF
C _{OSS}	Output Capacitance			242		pF
C _{RSS}	Reverse Transfer Capacitance			204		pF
SWITCHING CHARACTERISTICS ^b						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =15V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		25		ns
t _r	Rise Time			32		ns
t _{D(OFF)}	Turn-Off Delay Time			70		ns
t _f	Fall Time			26		ns
Q _g	Total Gate Charge	V _{DS} =15V,I _D =27.5A,V _{GS} =10V		23		nC
		V _{DS} =15V,I _D =27.5A,V _{GS} =4.5V		11		nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V,I _D =27.5A, V _{GS} =10V		2.3		nC
Q _{gd}	Gate-Drain Charge			7.1		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _S =5A		0.79	1.3	V

Notes

- Pulse Test: Pulse Width ≤ 10us, Duty Cycle ≤ 1%.
- Guaranteed by design, not subject to production testing.
- Drain current limited by maximum junction temperature.
- Starting T_J=25°C, L=0.5mH, V_{DD} = 20V. (See Figure13)
- Mounted on FR4 Board of 1 inch², 2oz.

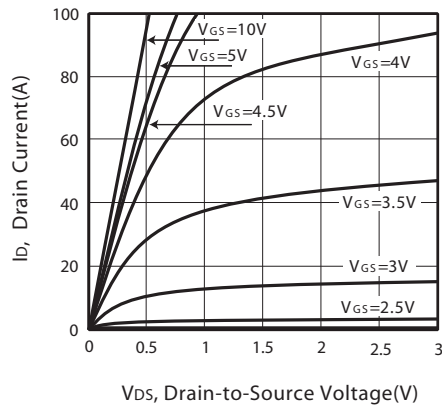


Figure 1. Output Characteristics

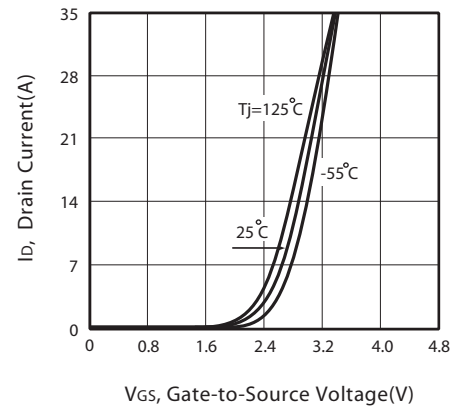


Figure 2. Transfer Characteristics

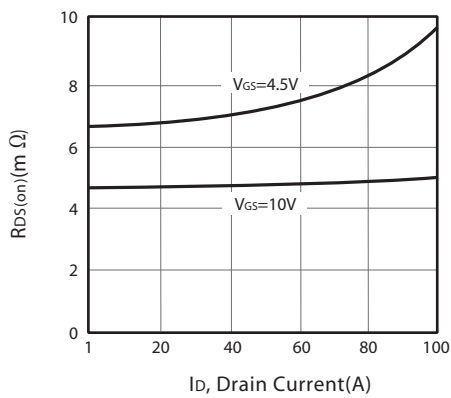


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

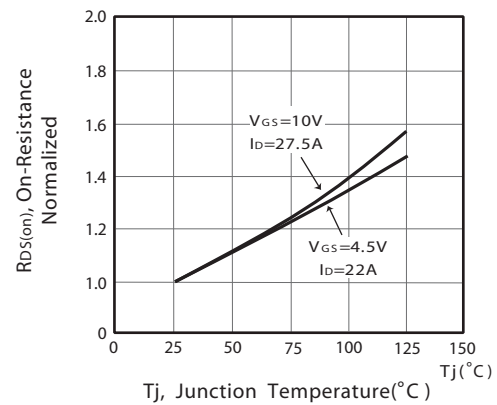


Figure 4. On-Resistance Variation with Drain Current and Temperature

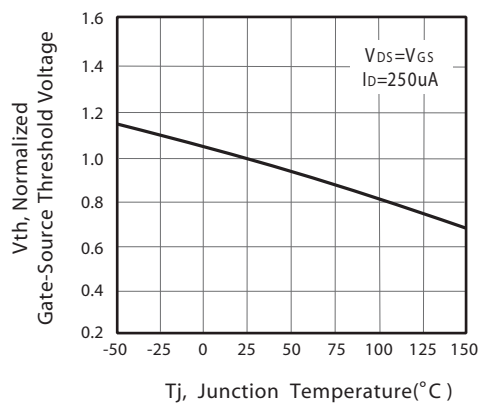


Figure 5. Gate Threshold Variation with Temperature

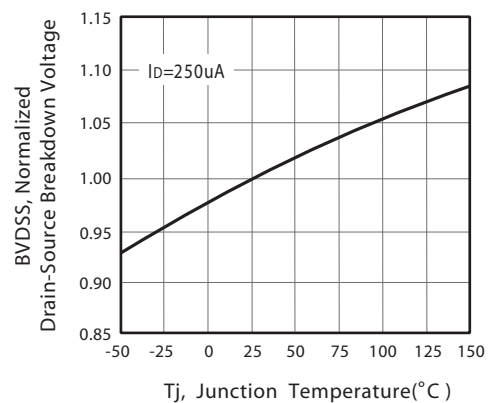
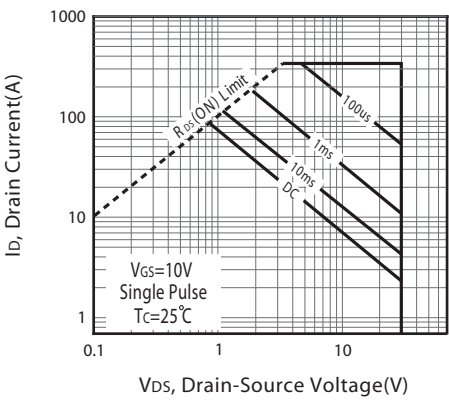
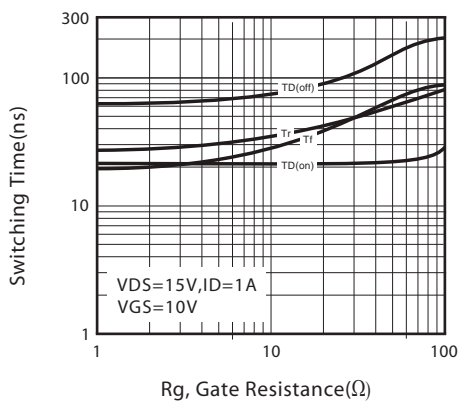
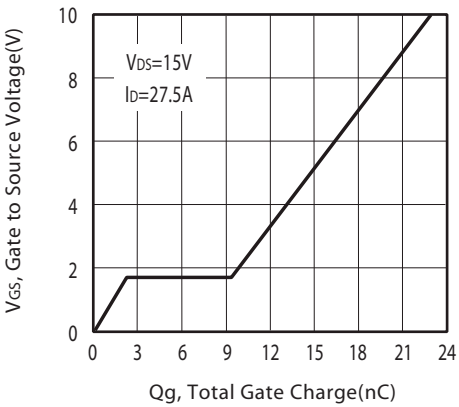
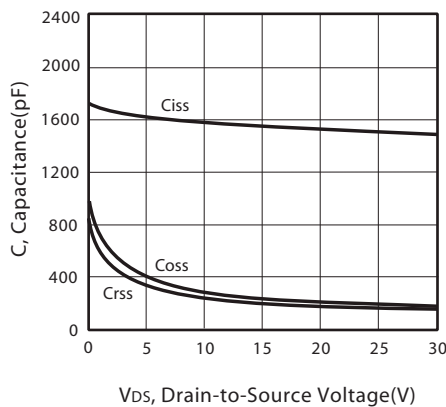
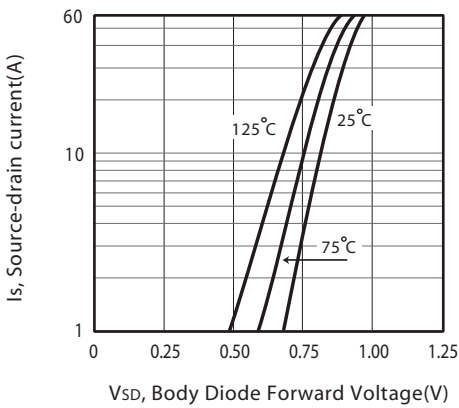
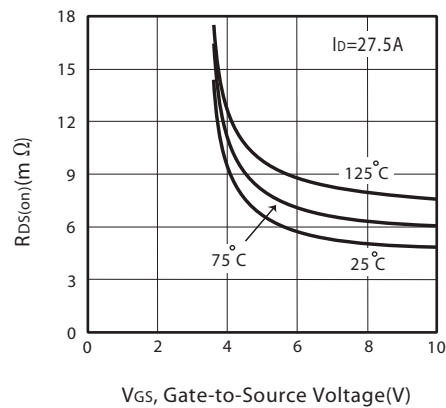
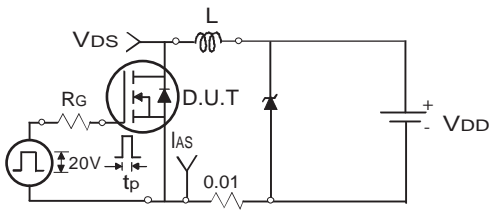


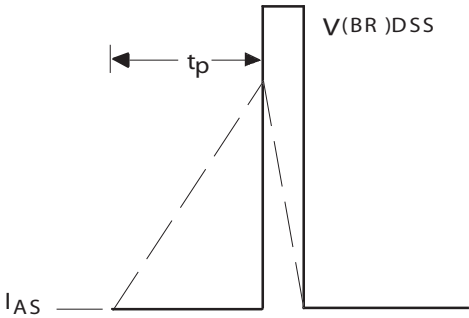
Figure 6. Breakdown Voltage Variation with Temperature





Uncamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

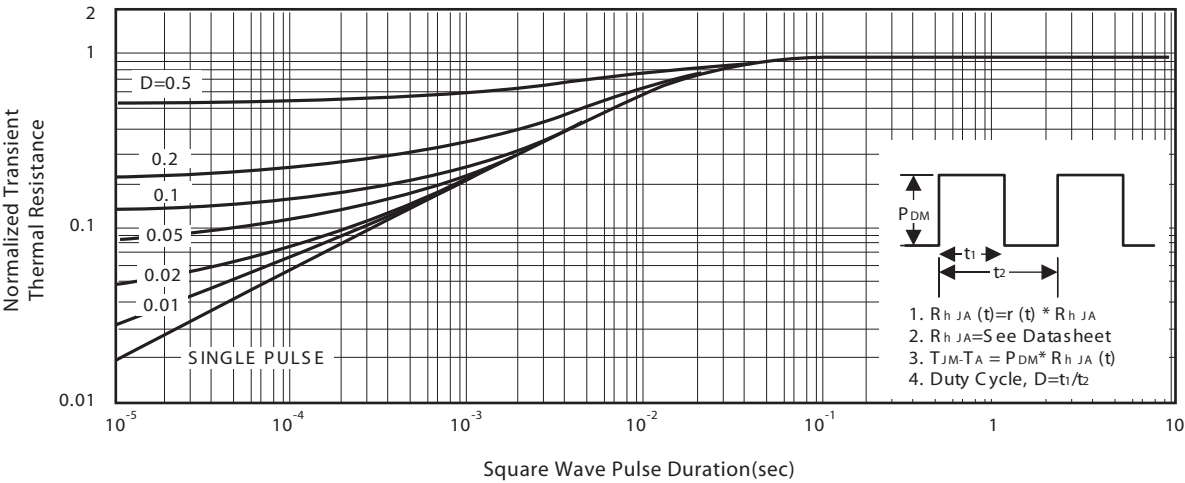
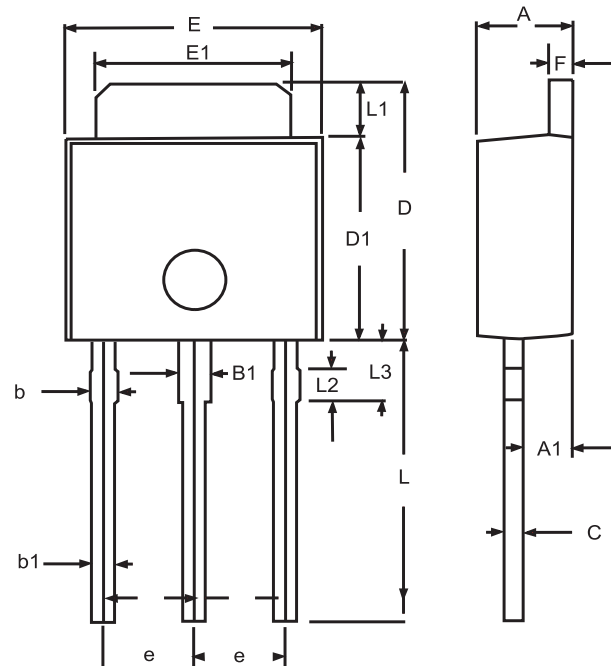


Figure 14. Normalized Thermal Transient Impedance Curve

PACKAGE OUTLINE DIMENSIONS

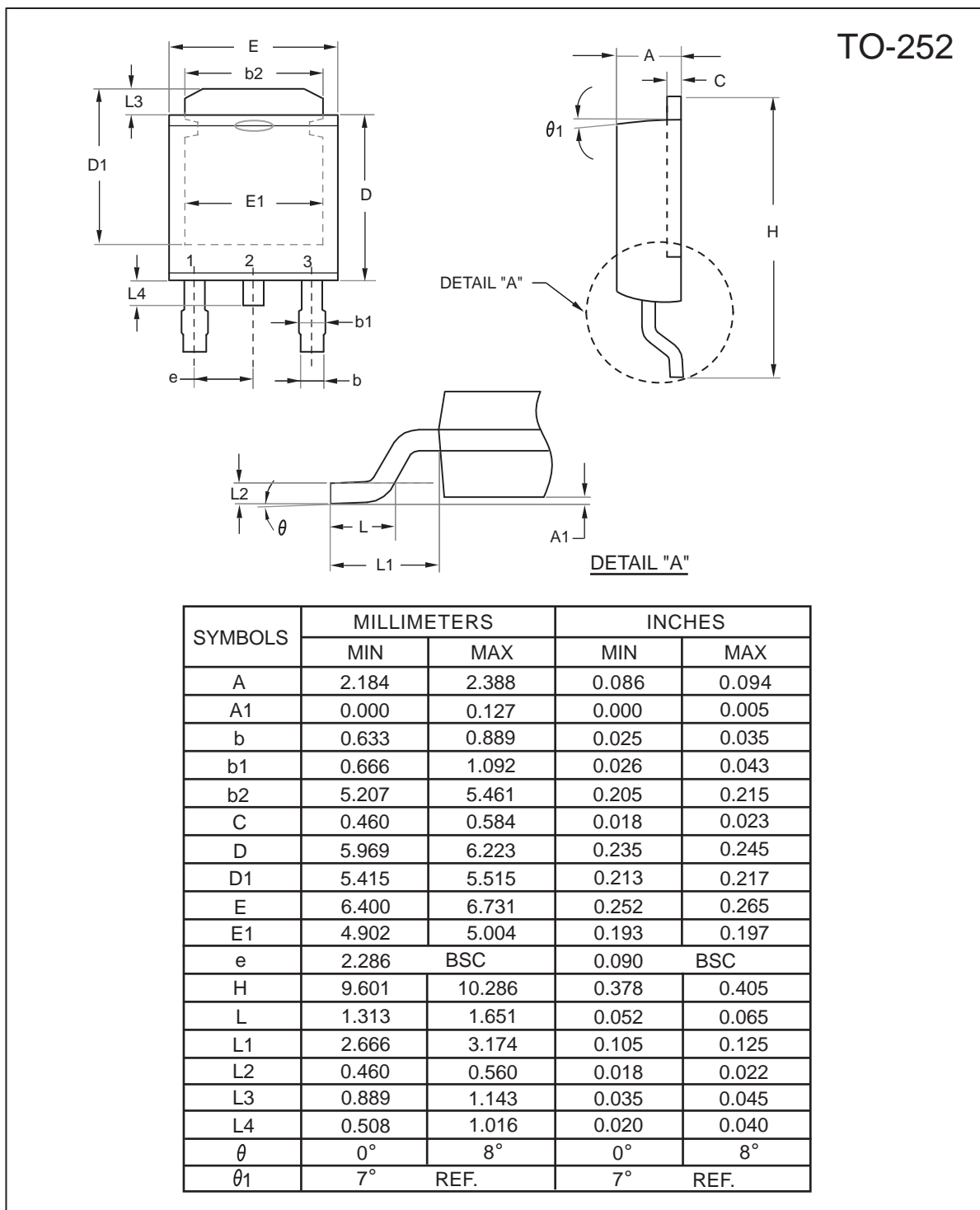
TO-251



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

STU/D336S

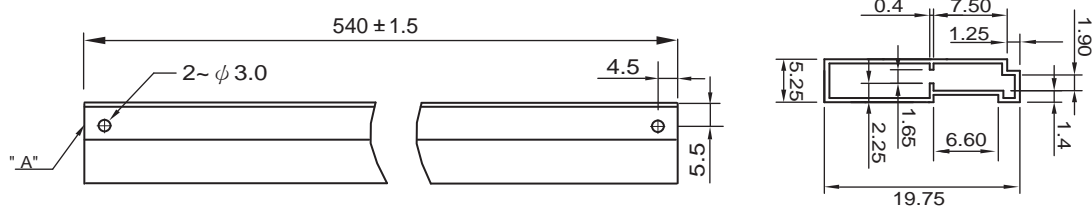
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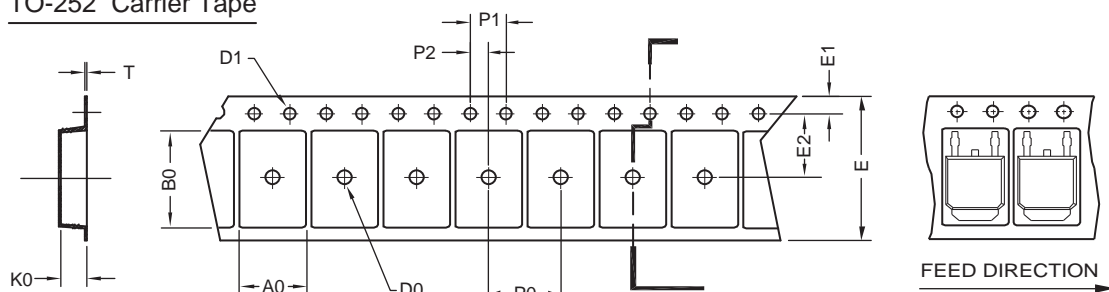
Jul,27,2015

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

TO-251 Tube



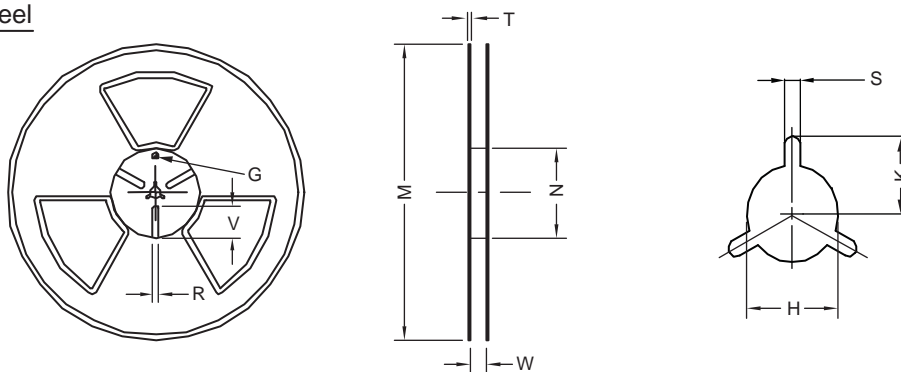
TO-252 Carrier Tape



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	φ 2	φ 1.5 + 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	---	---	---