



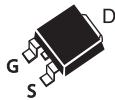
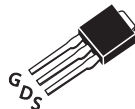
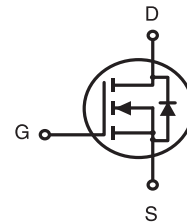
N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
60V	30A	20 @V _{GS} =10V

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		60	V
V _{GS}	Gate-Source Voltage		±20	V
I _D	Drain Current-Continuous ^a	T _C =25°C	30	A
		T _C =70°C	24	A
I _{DM}	-Pulsed ^a		88	A
E _{AS}	Single Pulse Avalanche Energy ^c		100	mJ
P _D	Maximum Power Dissipation	T _C =25°C	42	W
		T _C =70°C	27	W
T _J , T _{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJC}	Thermal Resistance, Junction-to-Case	3	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	50	°C/W

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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	60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V , 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	2	2.6	4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =15A		16	20	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =15A		22		S
DYNAMIC CHARACTERISTICS ^b						
C _{ISS}	Input Capacitance	V _{DS} =25V,V _{GS} =0V f=1.0MHz		2190		pF
C _{OSS}	Output Capacitance			140		pF
C _{RSS}	Reverse Transfer Capacitance			105		pF
SWITCHING CHARACTERISTICS ^b						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =30V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		47		ns
t _r	Rise Time			31		ns
t _{D(OFF)}	Turn-Off Delay Time			62		ns
t _f	Fall Time			13		ns
Q _g	Total Gate Charge	V _{DS} =30V,I _D =15A,V _{GS} =10V		36		nC
Q _{gs}	Gate-Source Charge	V _{DS} =30V,I _D =15A, V _{GS} =10V		6		nC
Q _{gd}	Gate-Drain Charge			12		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _S =6A		0.81	1.3	V
Notes						
a.Drain current limited by maximum junction temperatrue.						
b.Guaranteed by design, not subject to production testing.						
c.Starting T _J =25°C,L=0.5mH,V _{DD} = 30V.(See Figure13)						

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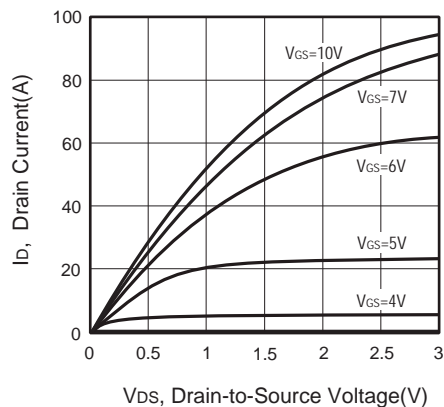


Figure 1. Output Characteristics

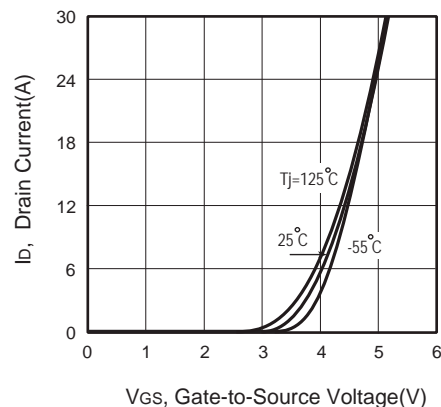


Figure 2. Transfer Characteristics

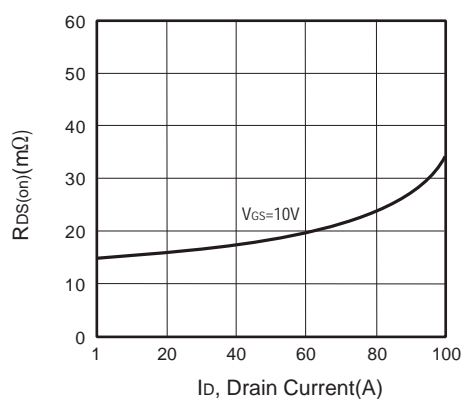


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

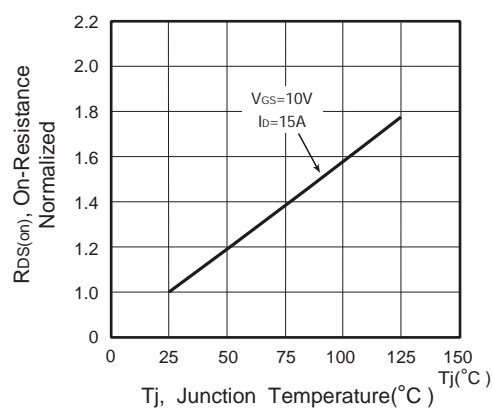


Figure 4. On-Resistance Variation with Drain Current and Temperature

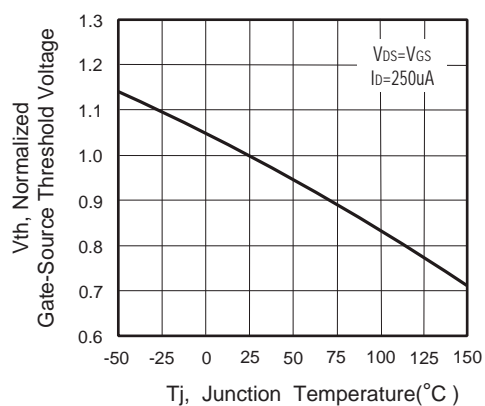


Figure 5. Gate Threshold Variation with Temperature

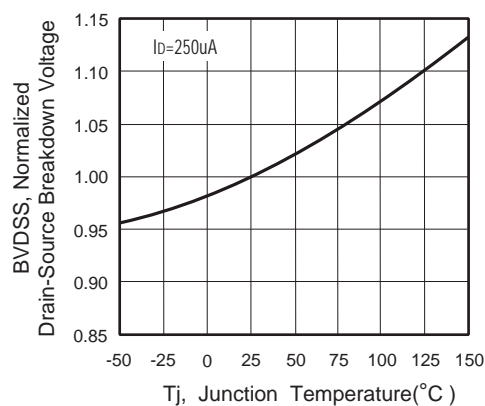


Figure 6. Breakdown Voltage Variation with Temperature

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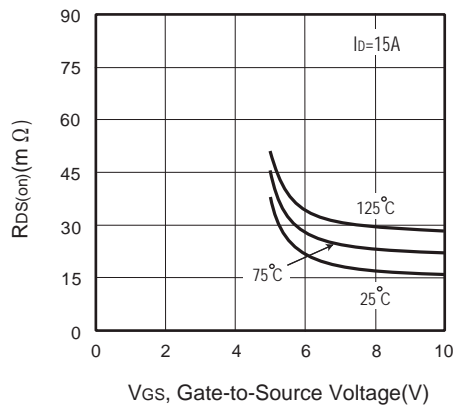


Figure 7. On-Resistance vs. Gate-Source Voltage

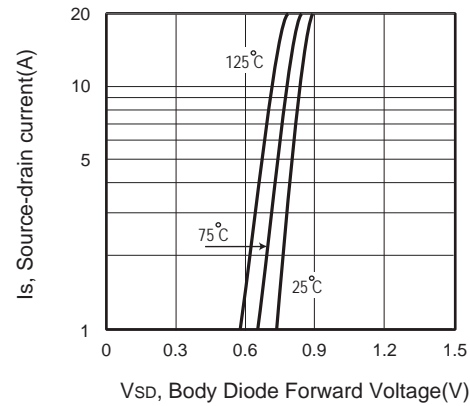


Figure 8. Body Diode Forward Voltage Variation with Source Current

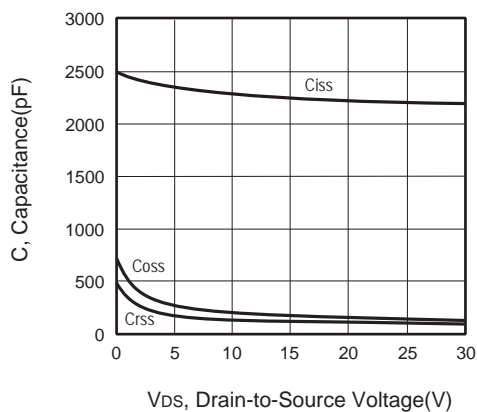


Figure 9. Capacitance

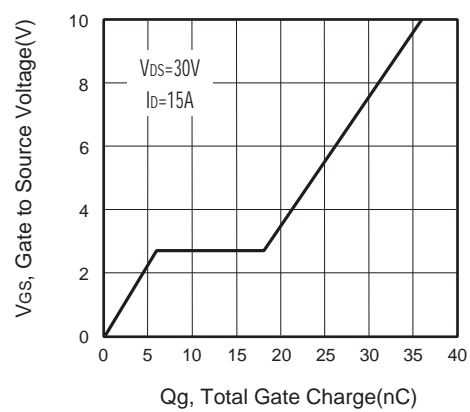


Figure 10. Gate Charge

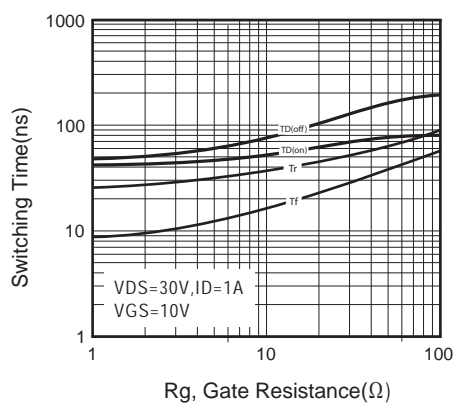


Figure 11. switching characteristics

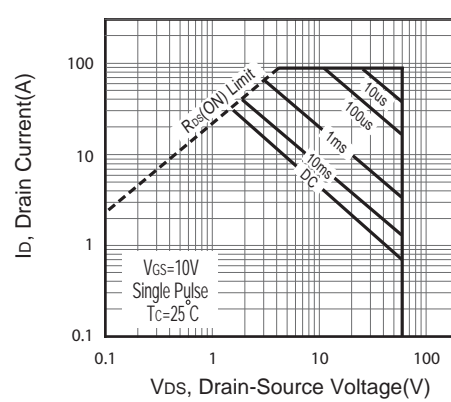


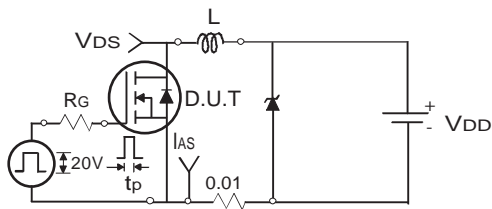
Figure 12. Maximum Safe Operating Area

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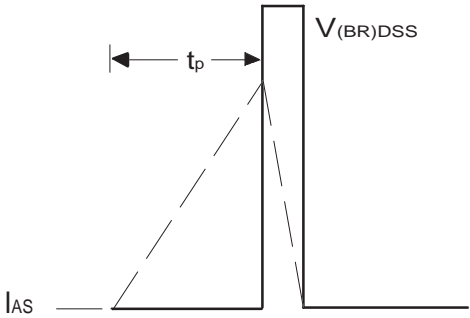
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Uncamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

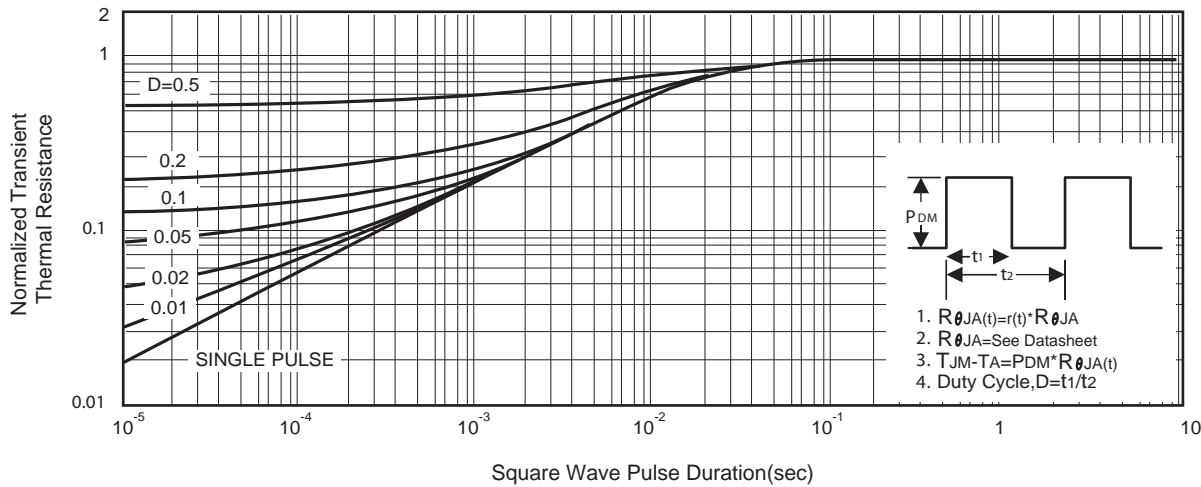


Figure 14. Normalized Thermal Transient Impedance Curve

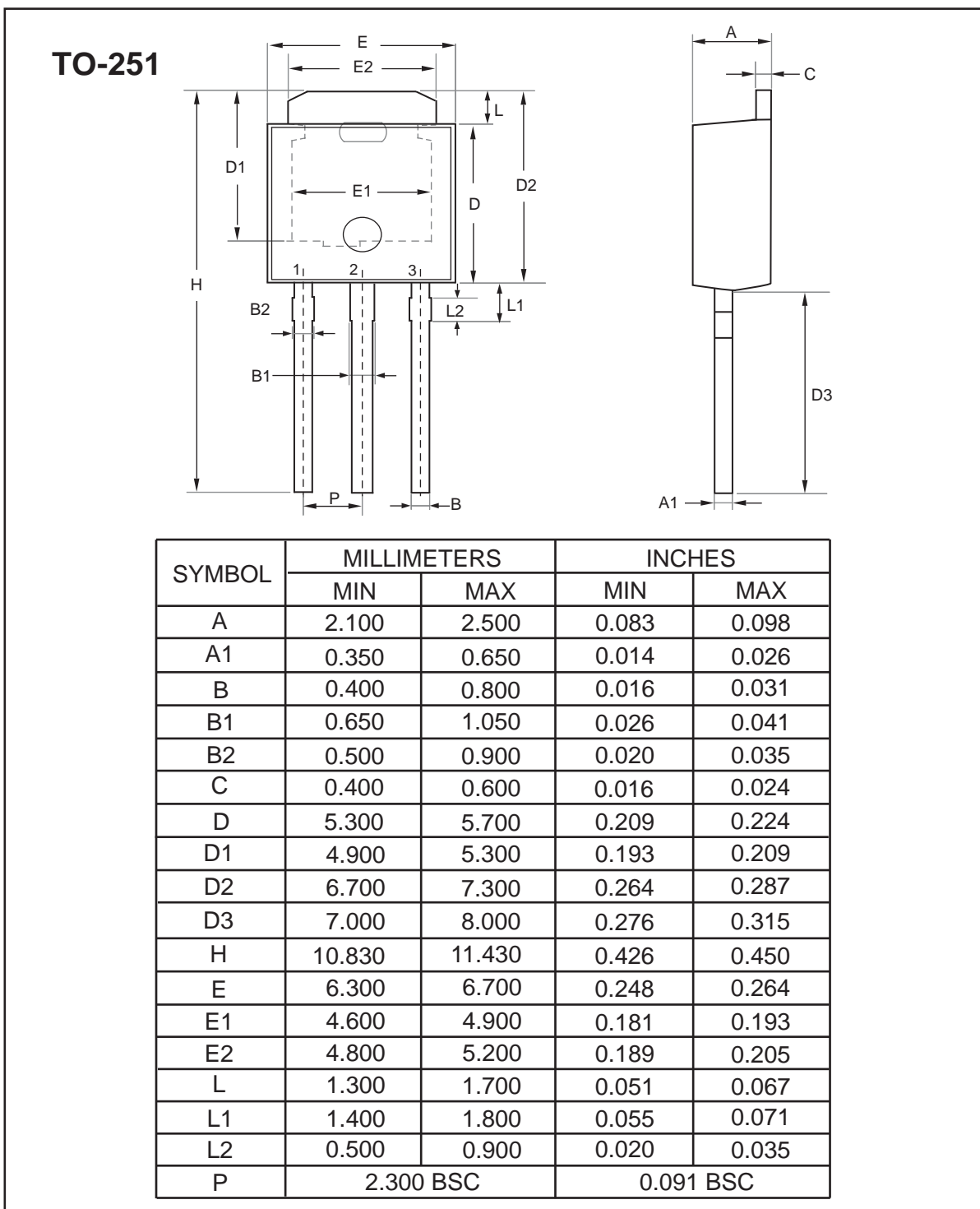
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PACKAGE OUTLINE DIMENSIONS

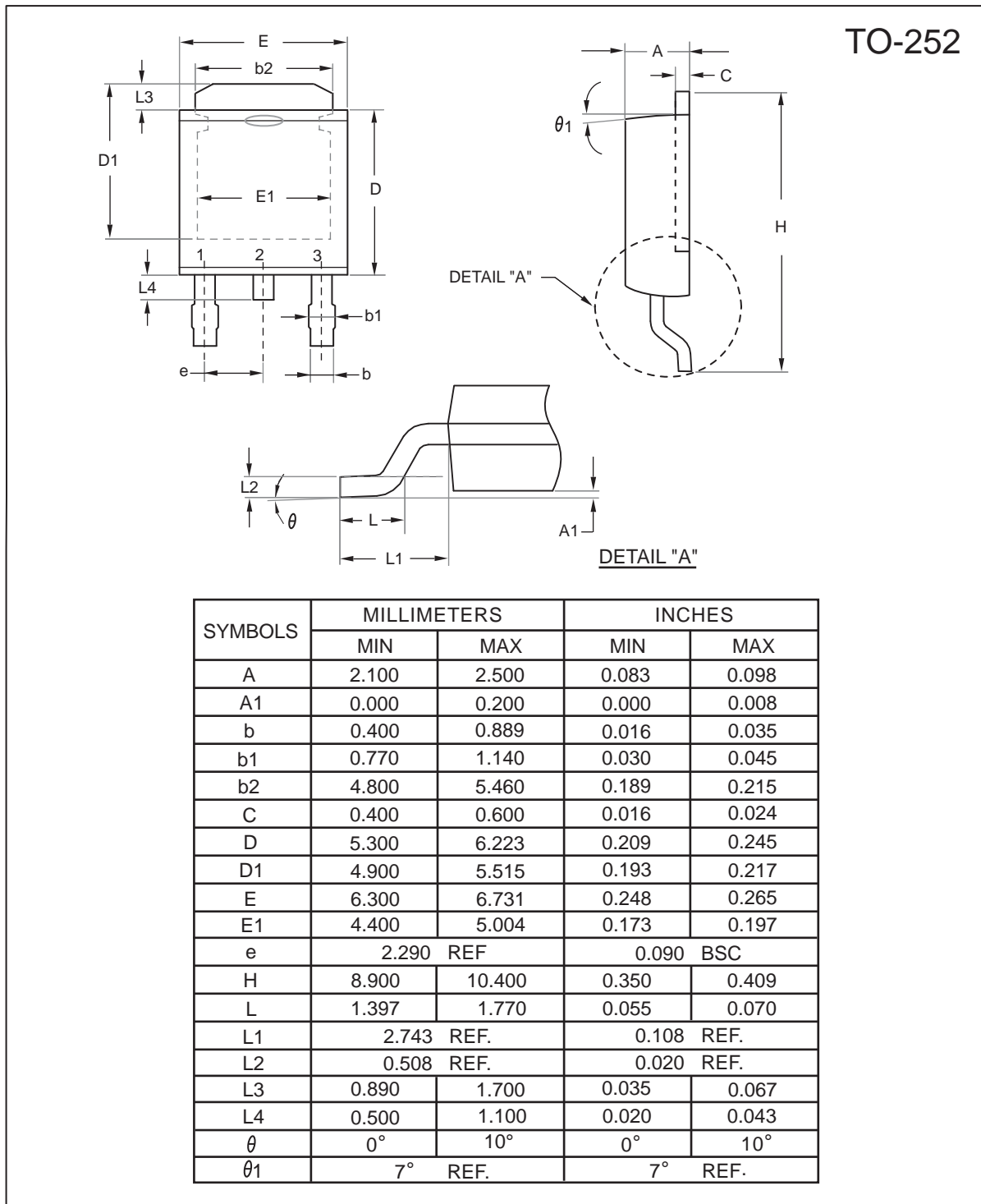


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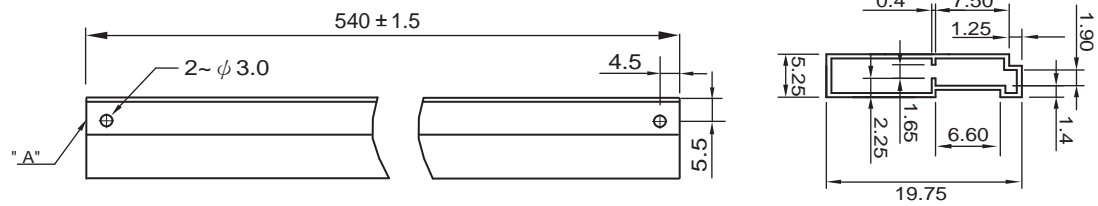
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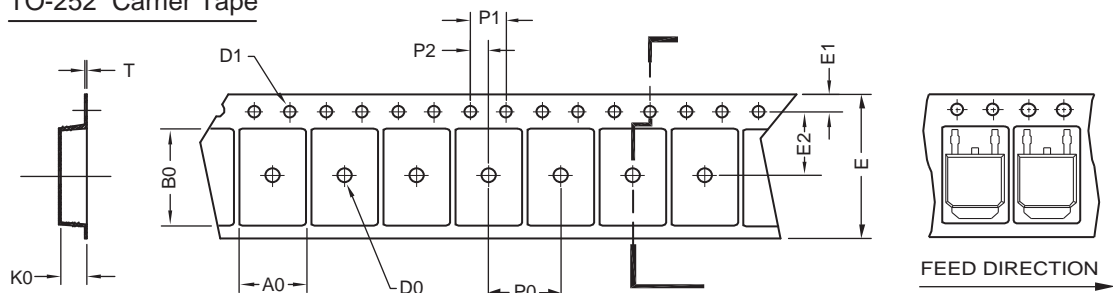
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TO-251 Tube/TO-252 Tape and Reel Data

TO-251 Tube



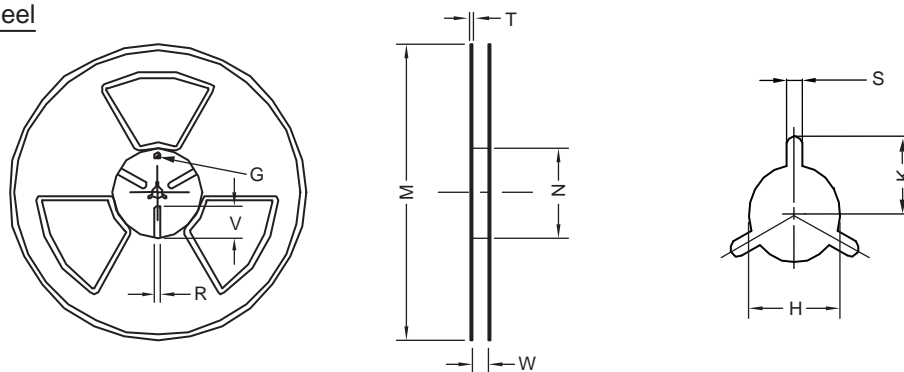
TO-252 Carrier Tape



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	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	---	---	---

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