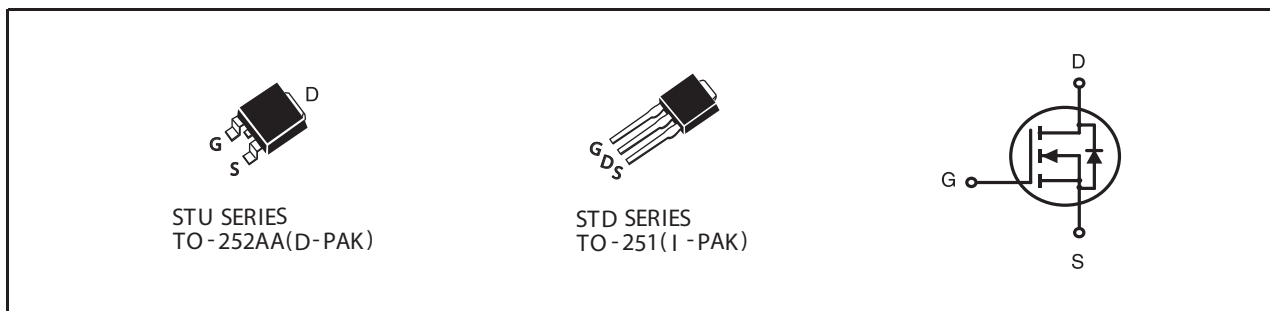


**N-Channel Logic Level Enhancement Mode Field Effect Transistor****PRODUCT SUMMARY**

VDSS	ID	RDS(ON) (mΩ) Typ
200V	8A	306 @ VGS=10V
		328 @ VGS=4.5V

**FEATURES**

- Super high dense cell design for low RDS(ON).
- Rugged and reliable.
- TO-252 and TO-251 Package.

**ABSOLUTE MAXIMUM RATINGS** ( $T_C=25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Limit	Units
$V_{DS}$	Drain-Source Voltage	200	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current-Continuous <sup>c</sup>	$T_C=25^\circ\text{C}$	8
		$T_C=70^\circ\text{C}$	6.4
$I_{DM}$	-Pulsed <sup>a,c</sup>	23	A
$E_{AS}$	Single Pulse Avalanche Energy <sup>d</sup>	16	mJ
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	50
		$T_C=70^\circ\text{C}$	32
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ\text{C}$

**THERMAL CHARACTERISTICS**

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.5	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	$^\circ\text{C/W}$

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### ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =10mA	200			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =160V , V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±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	1	2	3	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =4A		306	370	m ohm
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =3.9A		328	430	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =10V , I <sub>D</sub> =4A		11		S
<b>DYNAMIC CHARACTERISTICS<sup>b</sup></b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V f=1.0MHz		1040		pF
C <sub>OSS</sub>	Output Capacitance			63		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			30		pF
<b>SWITCHING CHARACTERISTICS<sup>b</sup></b>						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =100V I <sub>D</sub> =1A V <sub>GS</sub> =10V R <sub>GEN</sub> = 6 ohm		20		ns
t <sub>r</sub>	Rise Time			15.5		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time			28		ns
t <sub>f</sub>	Fall Time			10		ns
Q <sub>g</sub>	Total Gate Charge		V <sub>DS</sub> =100V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V		15	
		V <sub>DS</sub> =100V, I <sub>D</sub> =1A, V <sub>GS</sub> =4.5V		7.7		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =100V, I <sub>D</sub> =1A, V <sub>GS</sub> =10V		2.2		nC
Q <sub>gd</sub>	Gate-Drain Charge			4		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =4A		0.81	1.3	V

#### Notes

- Pulse Test: Pulse Width ≤ 10μs, Duty Cycle ≤ 1%.
- Guaranteed by design, not subject to production testing.
- Drain current limited by maximum junction temperature.
- Starting T<sub>J</sub>=25°C, L=0.5mH, V<sub>DD</sub> = 50V. (See Figure 13)
- Mounted on FR4 Board of 1 inch<sup>2</sup> , 2oz.

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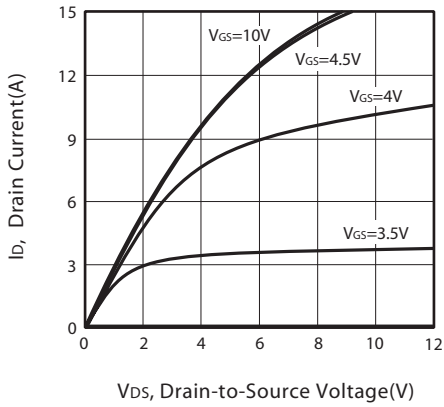


Figure 1. Output Characteristics

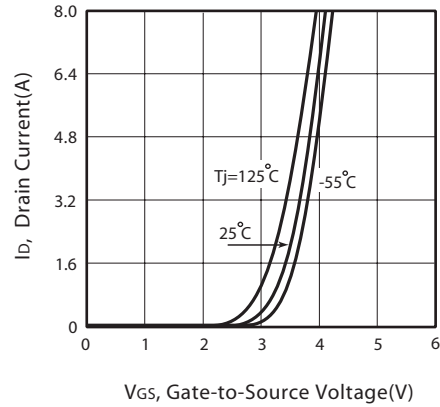


Figure 2. Transfer Characteristics

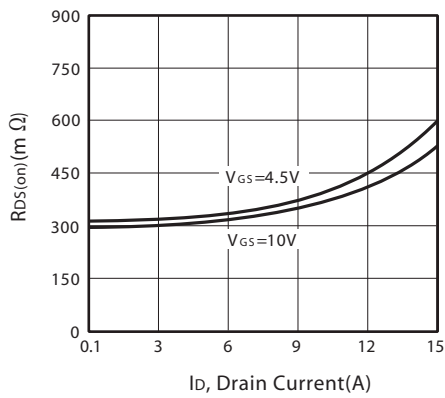


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

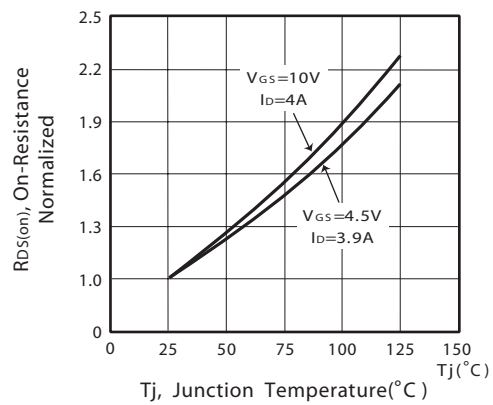


Figure 4. On-Resistance Variation with Drain Current and Temperature

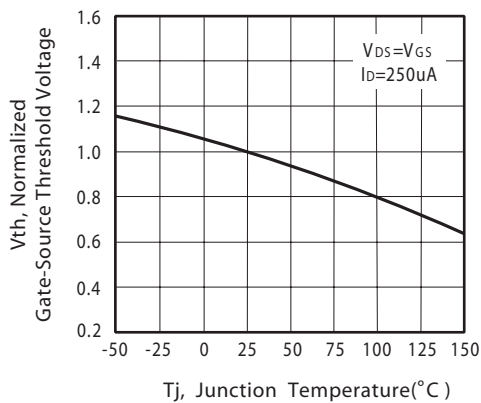


Figure 5. Gate Threshold Variation with Temperature

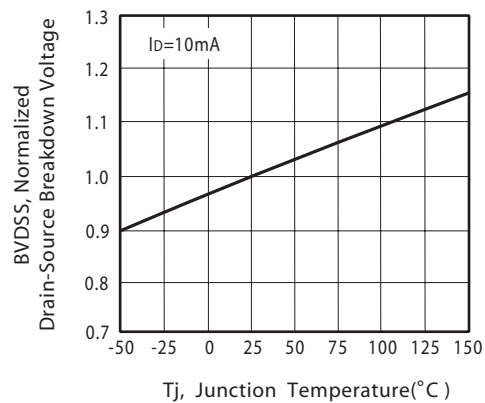


Figure 6. Breakdown Voltage Variation with Temperature

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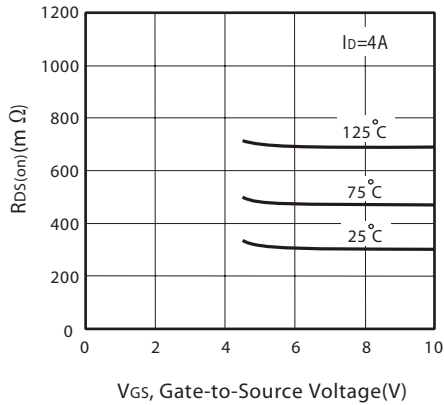


Figure 7. On-Resistance vs. Gate-Source Voltage

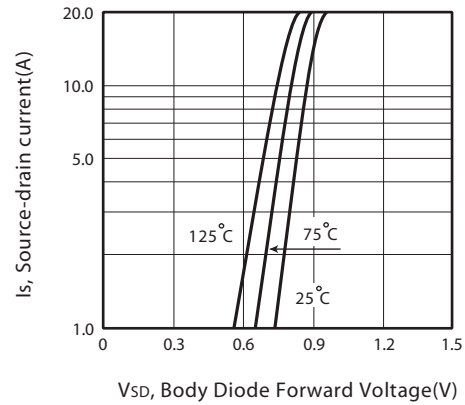


Figure 8. Body Diode Forward Voltage Variation with Source Current

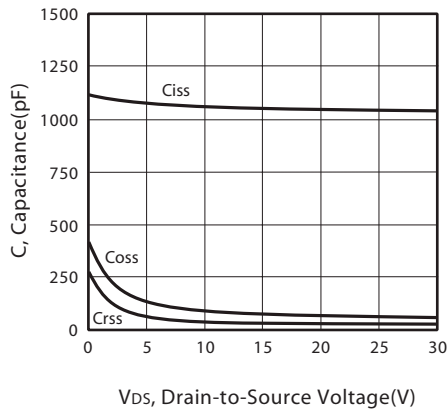


Figure 9. Capacitance

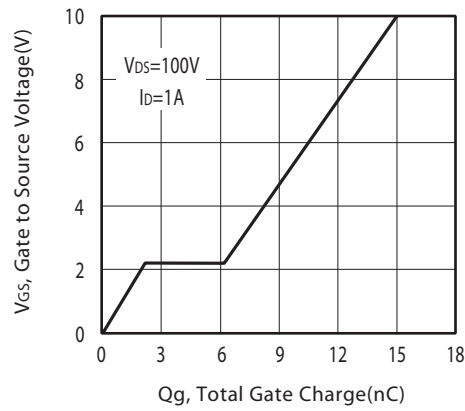


Figure 10. Gate Charge

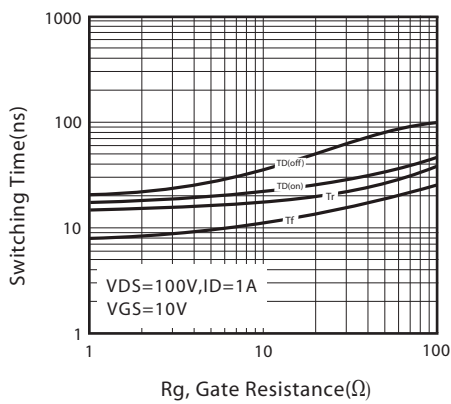


Figure 11. switching characteristics

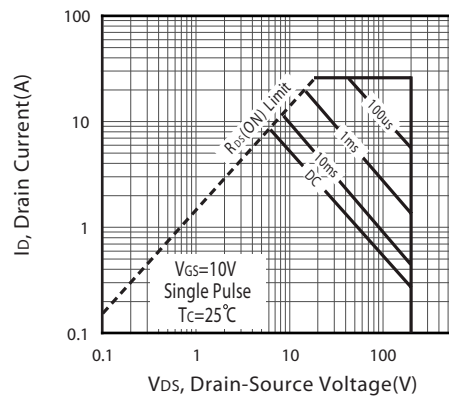
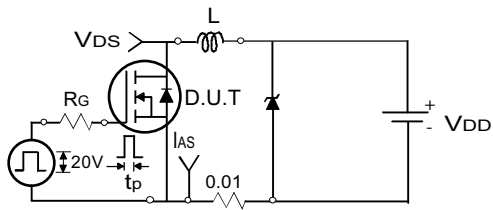


Figure 12. Maximum Safe Operating Area

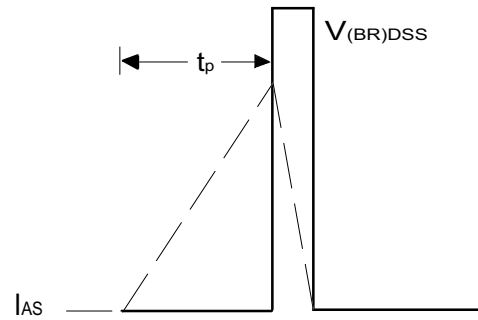
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Uncamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

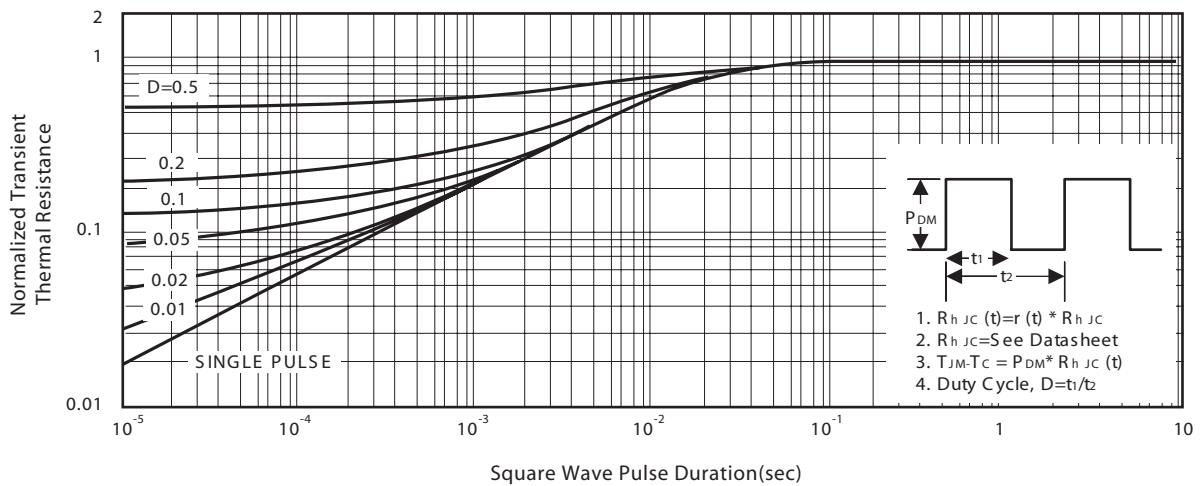
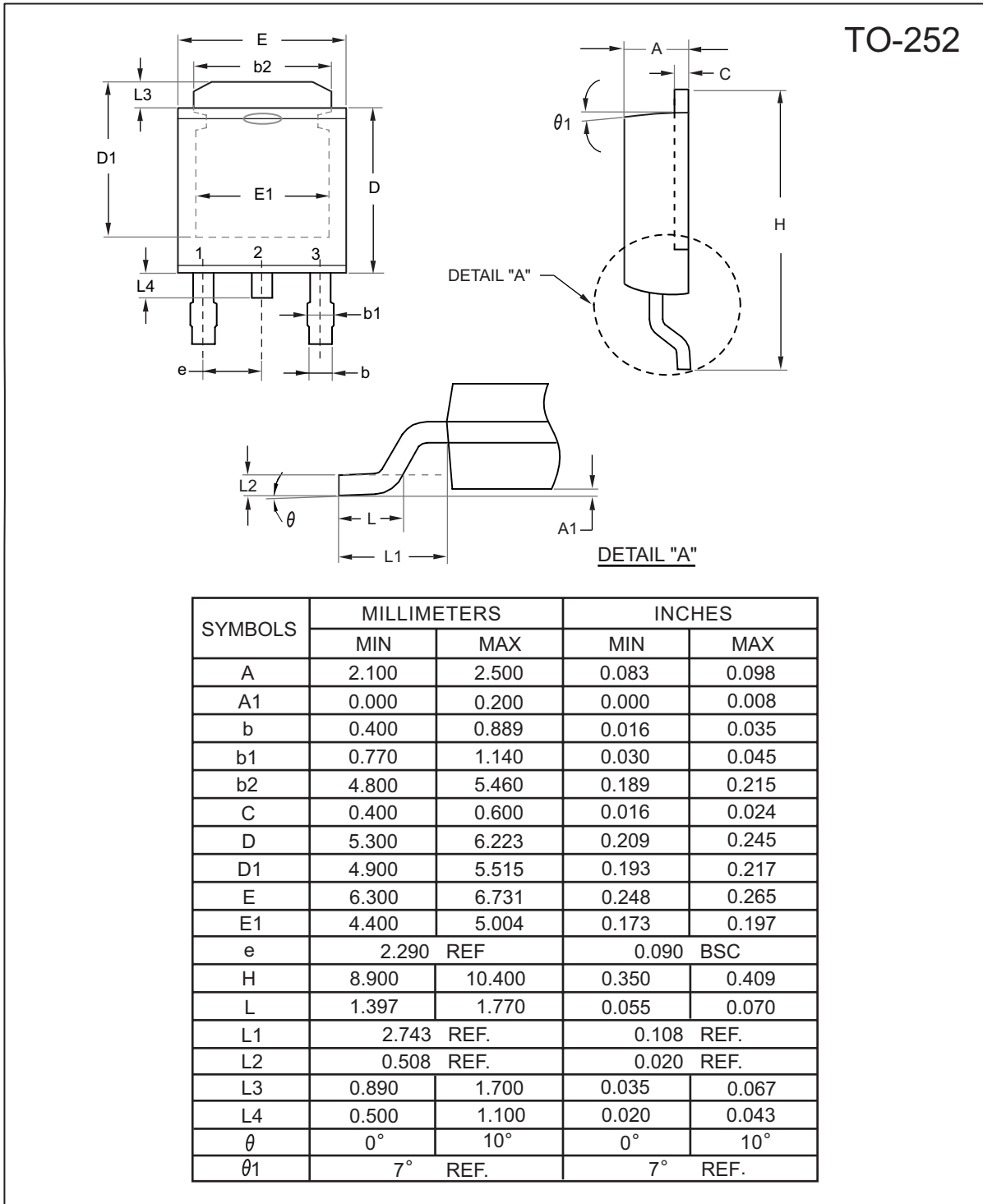


Figure 14. Normalized Thermal Transient Impedance Curve

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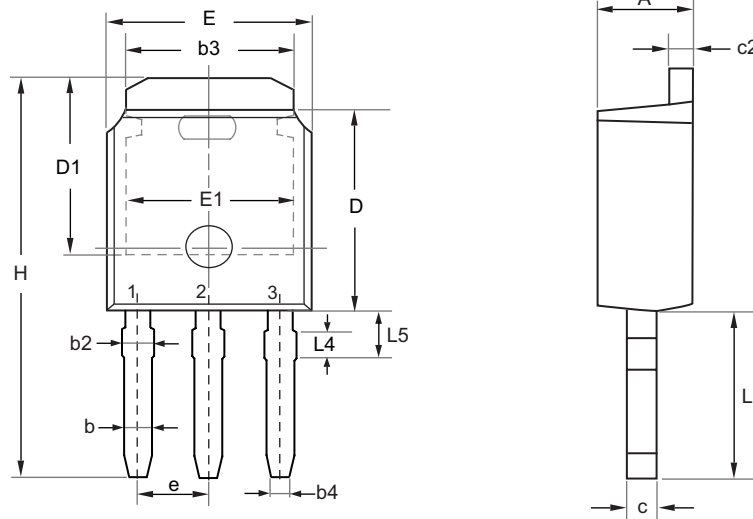
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### PACKAGE OUTLINE DIMENSIONS

TO-251



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
E	6.400	6.731	0.252	0.265
L	3.980	4.280	0.157	0.169
L4	0.698 REF		0.027 REF	
L5	0.972	1.226	0.038	0.048
D	6.000	6.223	0.236	0.245
H	11.050	11.450	0.435	0.450
b	0.640	0.880	0.025	0.035
b2	0.770	1.140	0.030	0.045
b3	5.210	5.460	0.205	0.215
b4	0.450	0.550	0.018	0.022
e	2.286 BSC		0.090 BSC	
A	2.200	2.380	0.087	0.094
c	0.400	0.600	0.016	0.024
c2	0.400	0.600	0.016	0.024
D1	5.100	---	0.201	---
E1	4.400	---	0.173	---

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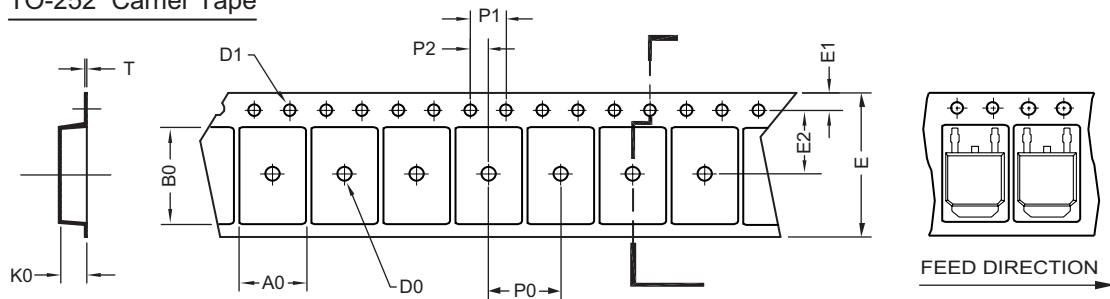
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## TO-251 Tube/TO-252 Tape and Reel Data

### TO-251 Tube



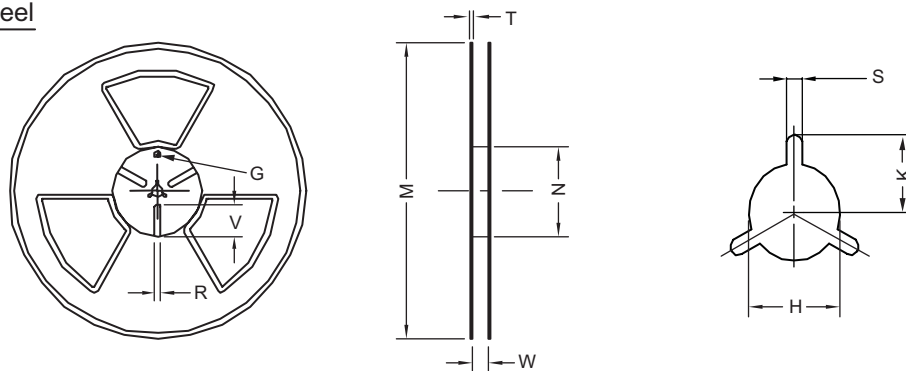
### TO-252 Carrier Tape



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	---	---	---

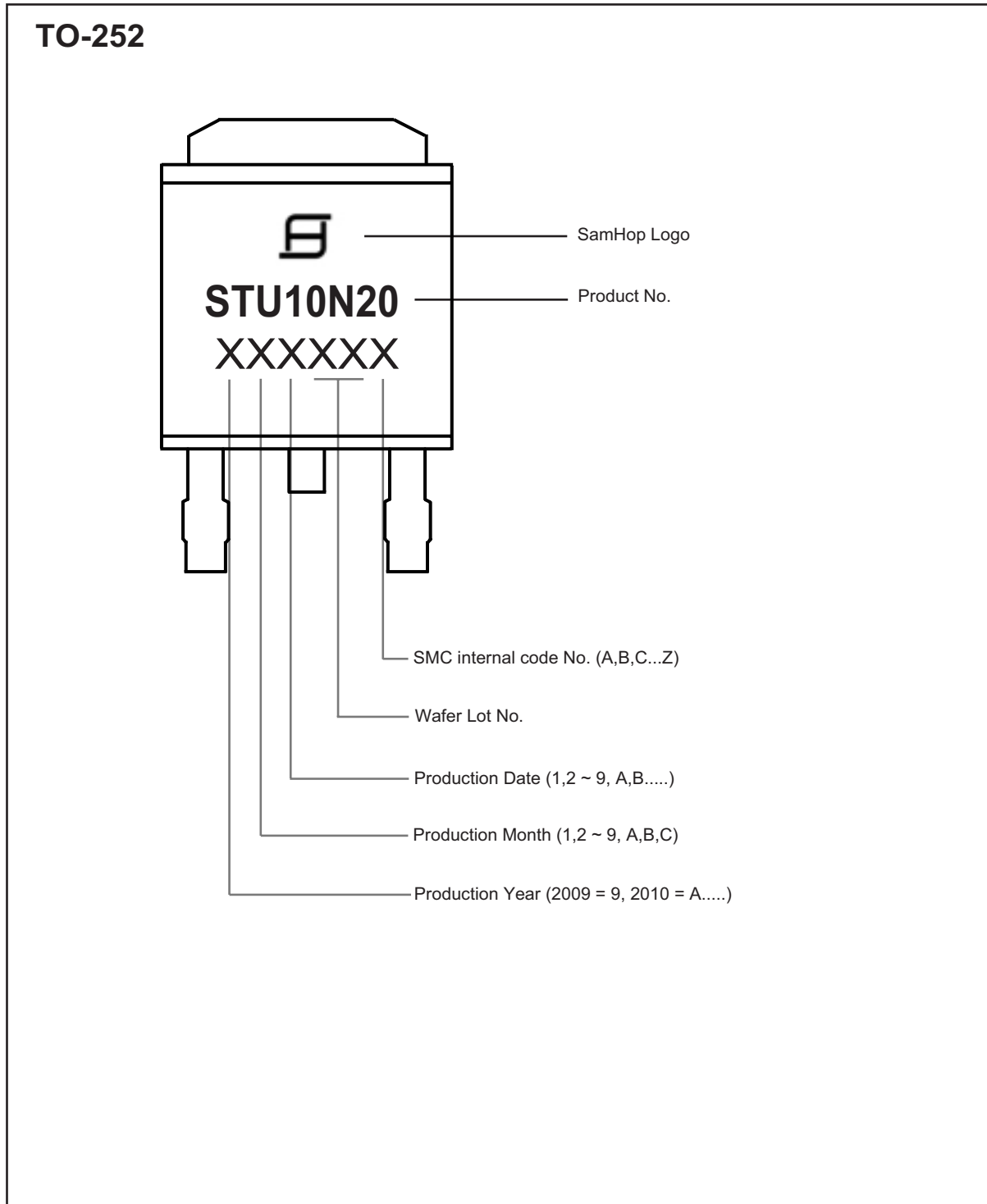
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## TOP MARKING DEFINITION

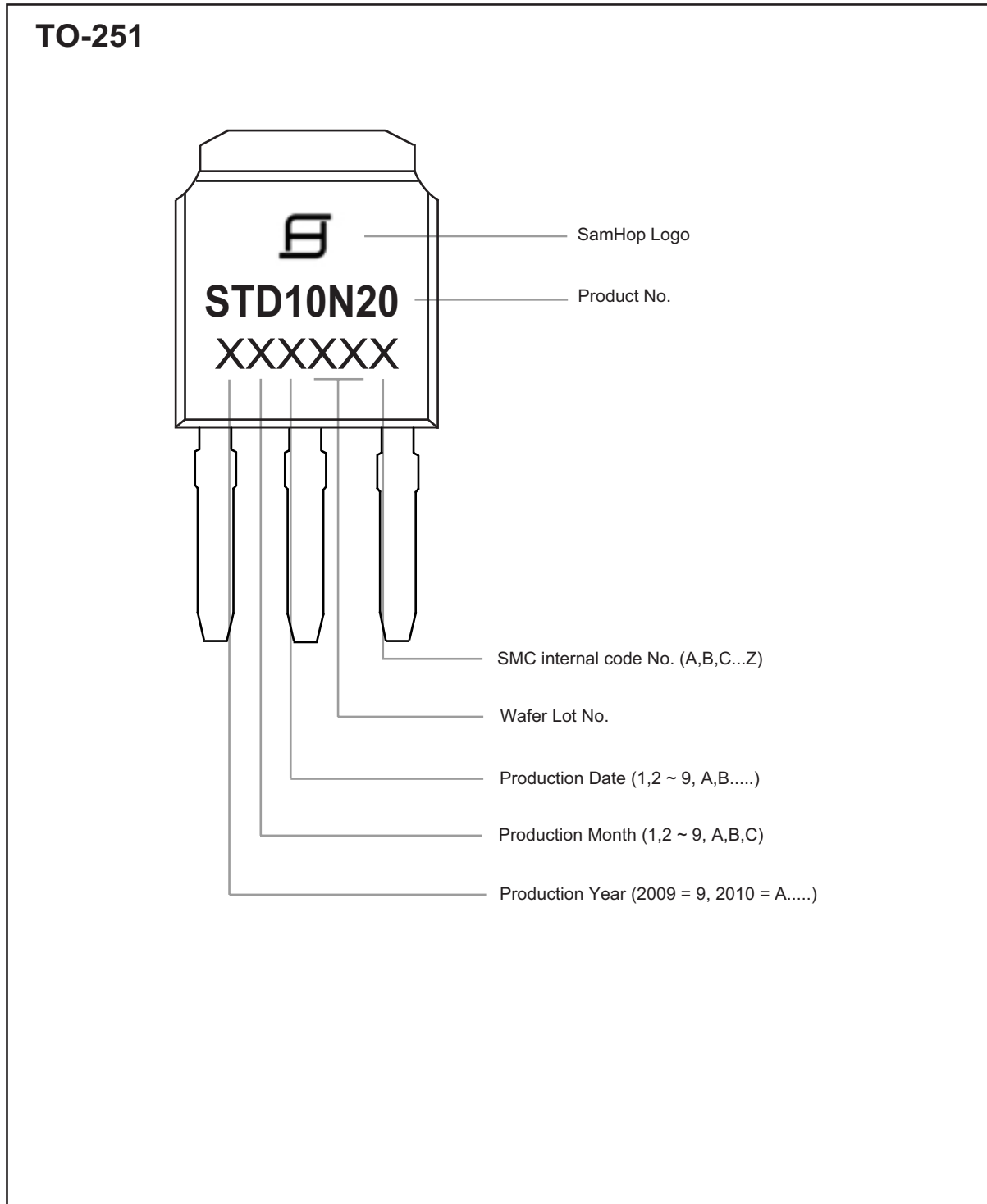


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## TOP MARKING DEFINITION



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