



N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V _{DSS}	I _D	R _{DS(ON)} (mΩ) Typ
100V	30A	30 @ V _{GS} =10V

FEATURES

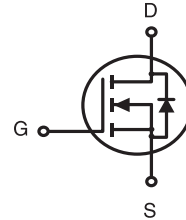
- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- TO-252 and TO-251 Package.



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		100	V
V _{GS}	Gate-Source Voltage		±20	V
I _D	Drain Current-Continuous ^c	T _C =25°C	30	A
		T _C =70°C	25	A
I _{DM}	-Pulsed ^{a c}		88	A
P _D	Maximum Power Dissipation	T _C =25°C	68	W
		T _C =70°C	48	W
T _J , T _{STG}	Operating Junction and Storage Temperature Range		-55 to 175	°C

THERMAL CHARACTERISTICS

R _{θJC}	Thermal Resistance, Junction-to-Case	2.2	°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	100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V , 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	2.8	4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =15A		30	36	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =15A		23		S
DYNAMIC CHARACTERISTICS ^b						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V f=1.0MHz		1235		pF
C _{oss}	Output Capacitance			136		pF
C _{RSS}	Reverse Transfer Capacitance			76		pF
SWITCHING CHARACTERISTICS ^b						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =50V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		32		ns
t _r	Rise Time			32		ns
t _{D(OFF)}	Turn-Off Delay Time			37		ns
t _f	Fall Time			12.4		ns
Q _g	Total Gate Charge	V _{DS} =50V, I _D =15A, V _{GS} =10V		14.5		nC
Q _{gs}	Gate-Source Charge	V _{DS} =50V, I _D =15A, V _{GS} =10V		3		nC
Q _{gd}	Gate-Drain Charge			6		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =5A		0.78	1.3	V
Notes						
a. Pulse Test: Pulse Width < 10us, Duty Cycle < 1%.						
b. Guaranteed by design, not subject to production testing.						
c. Drain current limited by maximum junction temperature.						
d. Mounted on FR4 Board of 1 inch ² , 2oz.						

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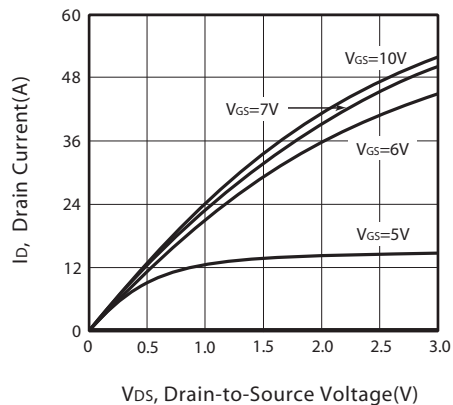


Figure 1. Output Characteristics

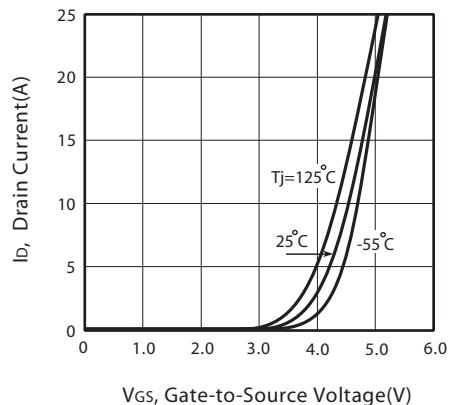


Figure 2. Transfer Characteristics

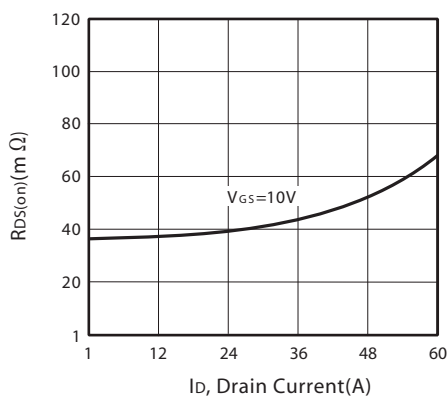


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

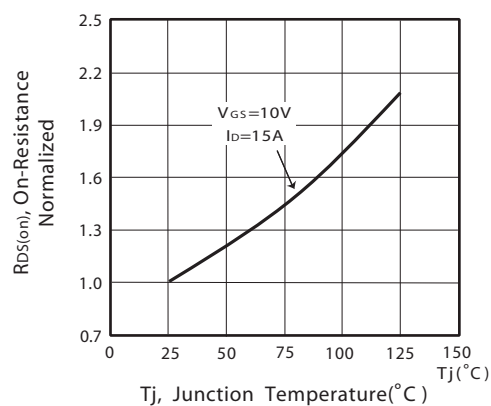


Figure 4. On-Resistance Variation with Drain Current and Temperature

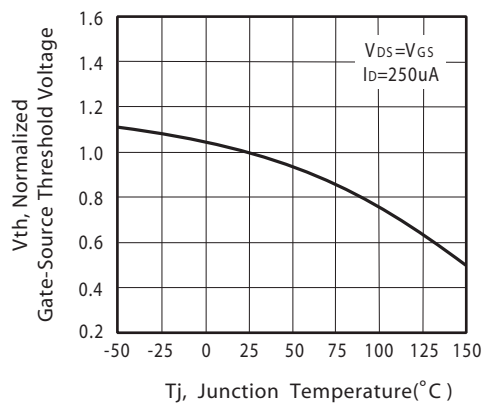


Figure 5. Gate Threshold Variation with Temperature

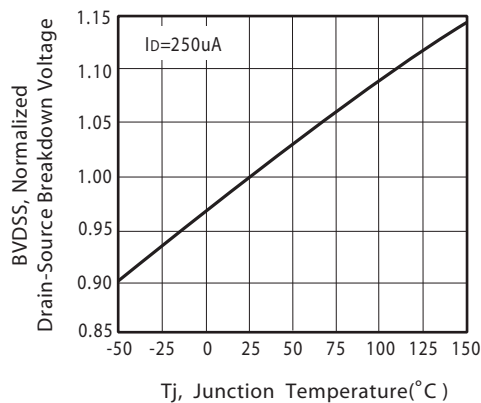


Figure 6. Breakdown Voltage Variation with Temperature

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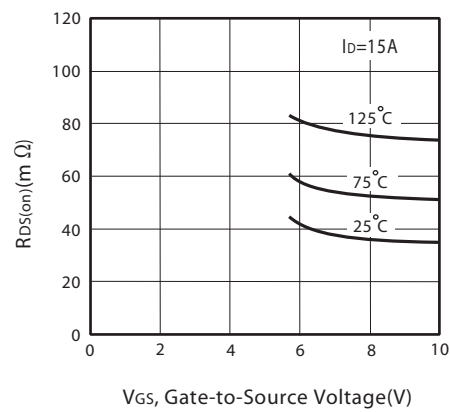


Figure 7. On-Resistance vs. Gate-Source Voltage

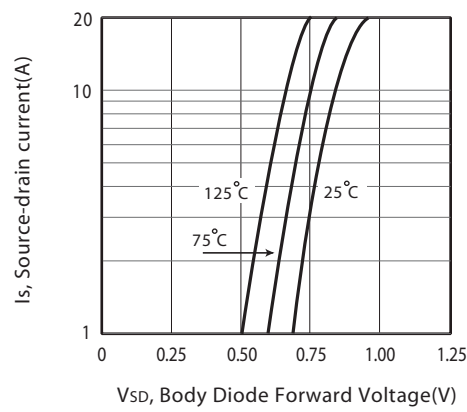


Figure 8. Body Diode Forward Voltage Variation with Source Current

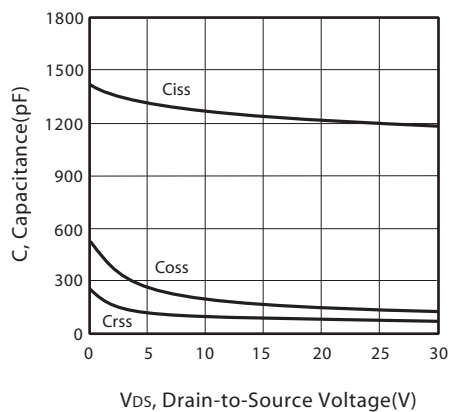


Figure 9. Capacitance

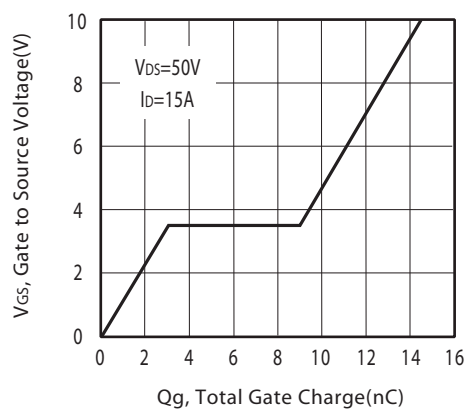


Figure 10. Gate Charge

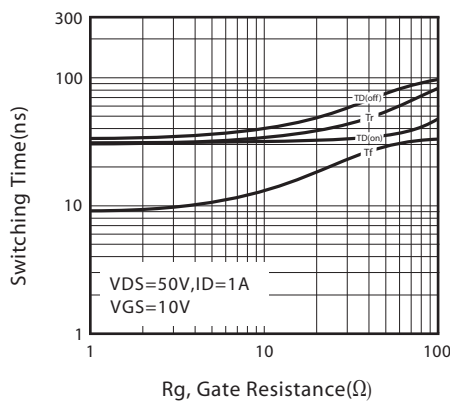


Figure 11. switching characteristics

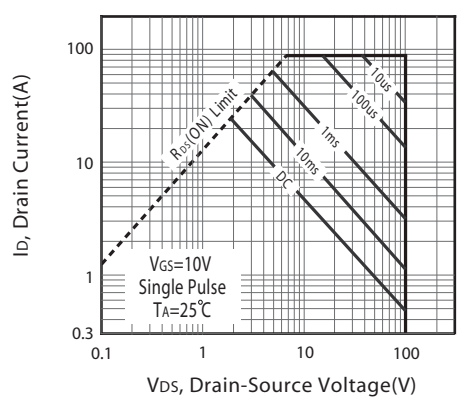


Figure 12. Maximum Safe Operating Area

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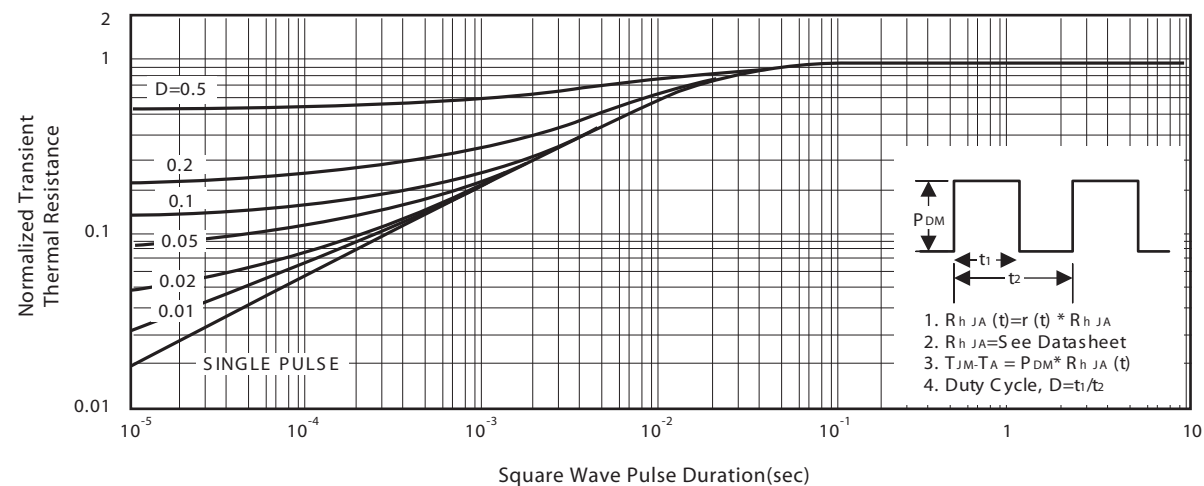


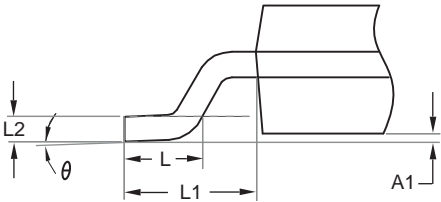
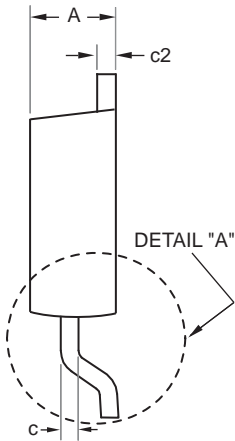
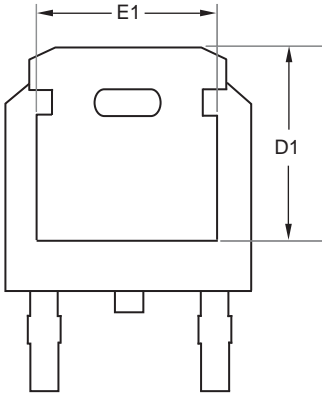
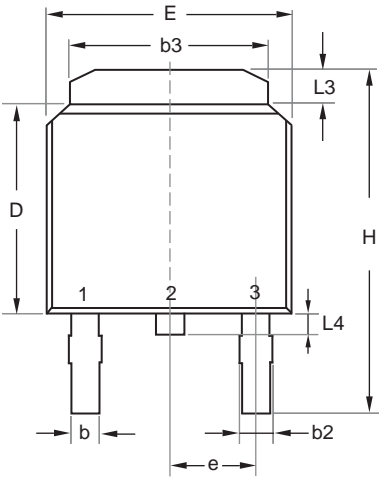
Figure 13. Normalized Thermal Transient Impedance Curve

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DETAIL "A"

SYMBOLS	MILLIMETERS	
	MIN	MAX
A	2.200	2.380
A1	0.000	0.127
b	0.635	0.889
b2	0.762	1.143
b3	5.200	5.460
c	0.450	0.600
c2	0.450	0.580
D	6.000	6.223
D1	5.210	5.380
e	2.286 BSC	
E	6.400	6.731
E1	4.318	4.900
H	9.400	10.400
L	1.400	1.770
L1	2.743 REF	
L2	0.508 BSC	
L3	0.890	1.270
L4	0.640	1.010
θ	0°	10°

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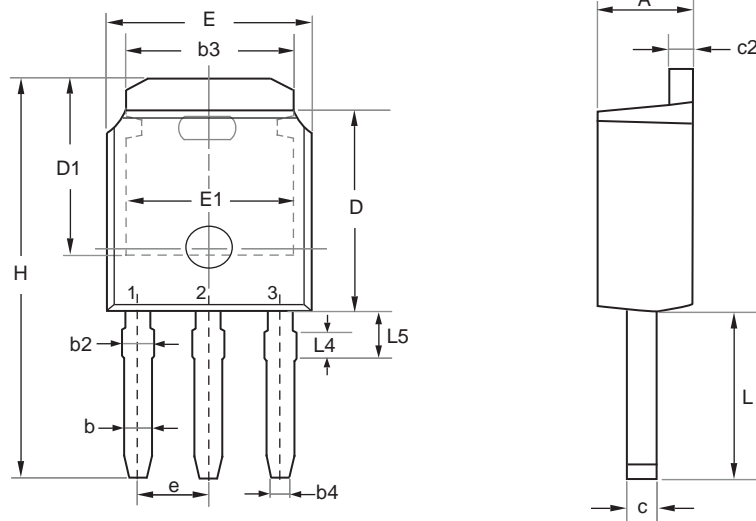
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PACKAGE OUTLINE DIMENSIONS

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SYMBOL	MILLIMETERS	
	MIN	MAX
E	6.350	6.731
L	3.700	4.400
L4	0.698 REF	
L5	0.972	1.226
D	5.970	6.223
H	9.670	11.450
b	0.630	0.850
b2	0.760	1.140
b3	4.950	5.460
b4	0.450	0.550
e	2.286 BSC	
A	2.180	2.390
c	0.400	0.610
c2	0.400	0.610
D1	5.100	---
E1	4.318	---

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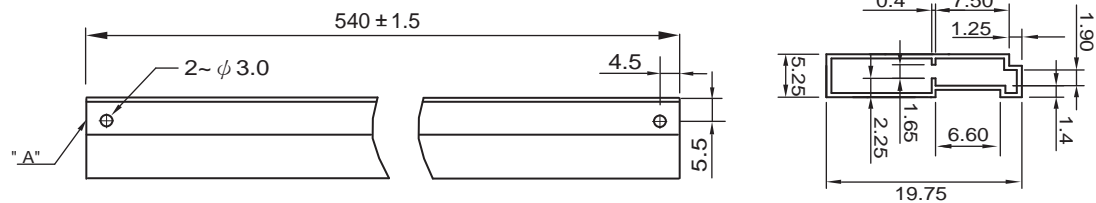
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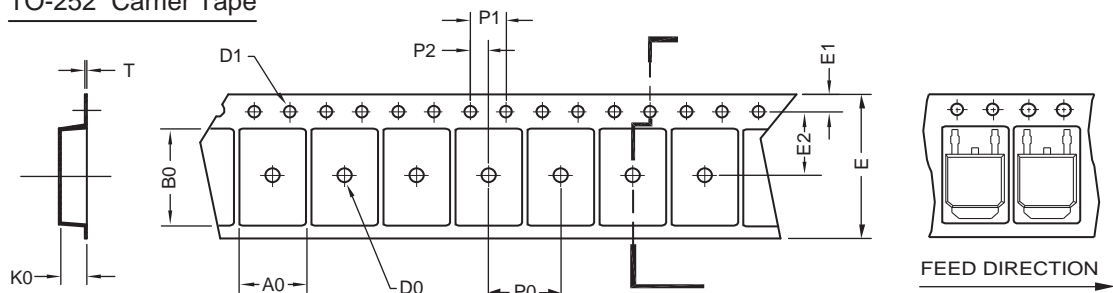
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TO-251 Tube/TO-252 Tape and Reel Data

TO-251 Tube



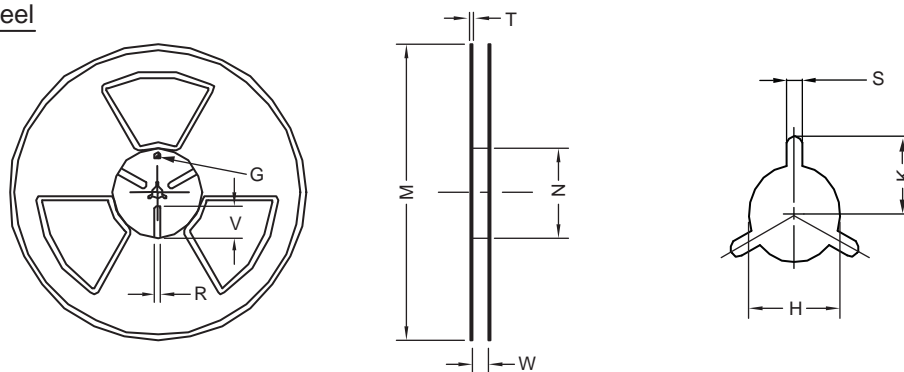
TO-252 Carrier Tape



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	$\phi 2$	$\phi 1.5$ $+0.1$ -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	$\phi 330$	$\phi 330$ ± 0.5	$\phi 97$ ± 1.0	17.0 $+1.5$ -0	2.2	$\phi 13.0$ $+0.5$ -0.2	10.6	2.0 ± 0.5	---	---	---

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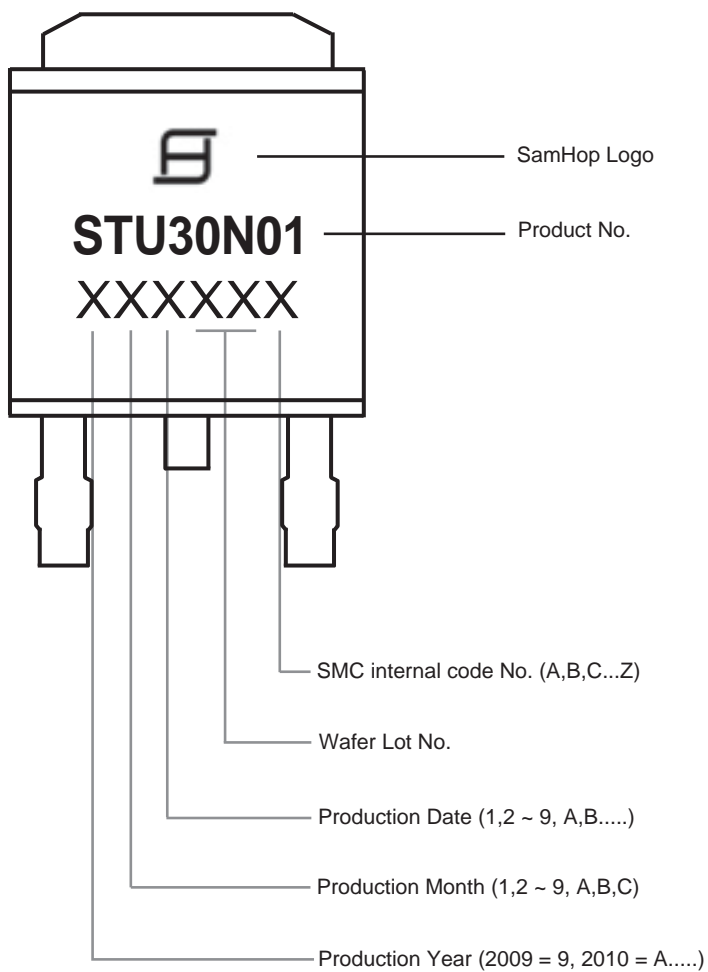
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TOP MARKING DEFINITION

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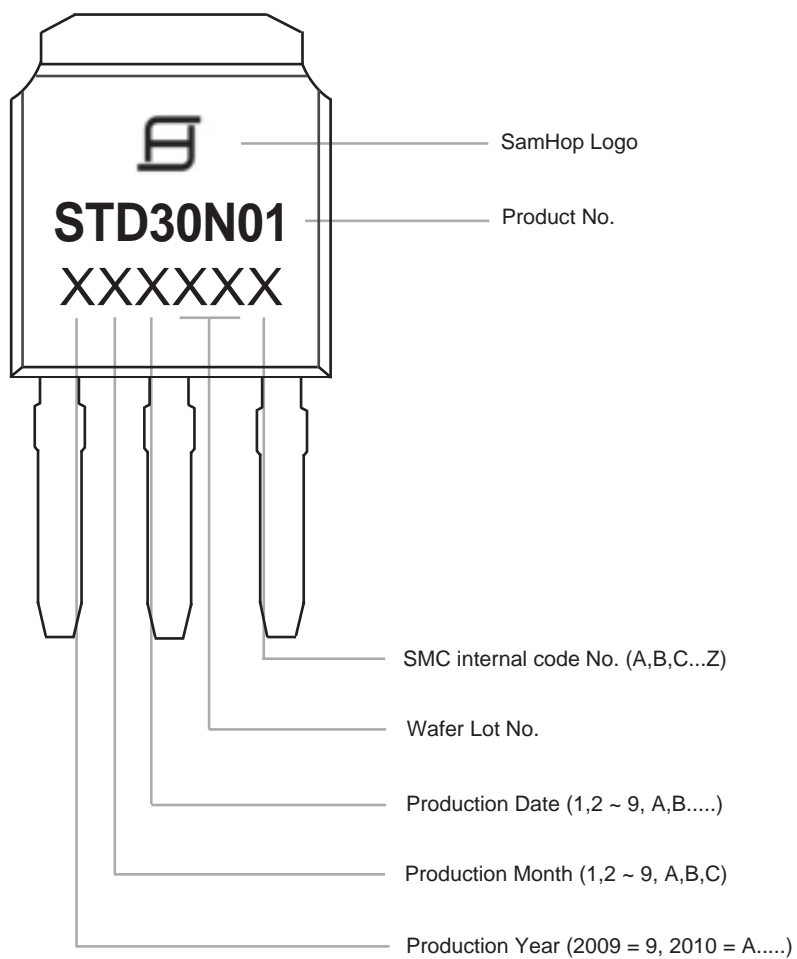
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