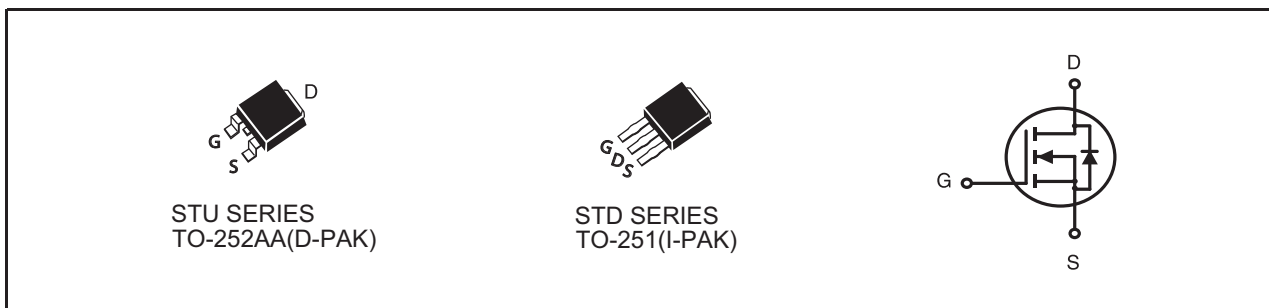


**N-Channel Logic Level Enhancement Mode Field Effect Transistor****PRODUCT SUMMARY**

V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
100V	6A	566 @ V _{GS} =10V
		734 @ V _{GS} =4.5V

FEATURES

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

**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 ^{a c}	T _C =25°C	6
		T _C =70°C	4.8
I _{DM}	-Pulsed ^c	17	A
E _{AS}	Single Pulse Avalanche Energy ^d	2	mJ
P _D	Maximum Power Dissipation ^a	T _C =25°C	42
		T _C =70°C	27
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

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

STU102S

STD102S

Ver 1.0

ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	2.1	3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=3A$		453	566	m ohm
		$V_{GS}=4.5V, I_D=2.7A$		544	734	m ohm
g_{FS}	Forward Transconductance	$V_{DS}=10V, I_D=3A$		6.4		S
DYNAMIC CHARACTERISTICS ^b						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V$ $f=1.0MHz$		170		pF
C_{oss}	Output Capacitance			22		pF
C_{RSS}	Reverse Transfer Capacitance			14		pF
SWITCHING CHARACTERISTICS ^b						
$t_{D(ON)}$	Turn-On Delay Time	$V_{DD}=50V$ $I_D=1A$ $V_{GS}=10V$ $R_{GEN}=6\text{ ohm}$		6.6		ns
t_r	Rise Time			10		ns
$t_{D(OFF)}$	Turn-Off Delay Time			14		ns
t_f	Fall Time			2		ns
Q_g	Total Gate Charge		$V_{DS}=50V, I_D=3A, V_{GS}=10V$		3.5	
Q_{gs}	Gate-Source Charge	$V_{DS}=50V, I_D=3A,$ $V_{GS}=10V$		0.72		nC
Q_{gd}	Gate-Drain Charge			1.4		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A$		0.81	1.3	V

Notes

- Surface Mounted on FR4 Board of 1 inch², 1oz.
- Guaranteed by design, not subject to production testing.
- Drain current limited by maximum junction temperature.
- Starting $T_J=25^\circ\text{C}, L=0.5\text{mH}, V_{DD}=50V$. (See Figure 13)

Jun,09,2014

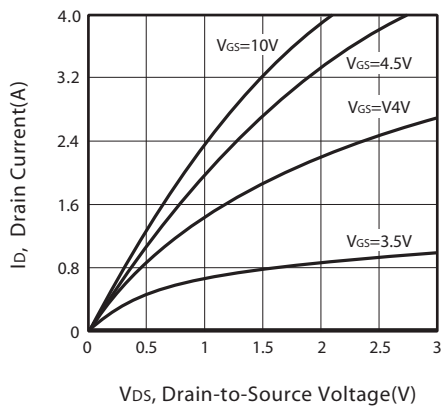


Figure 1. Output Characteristics

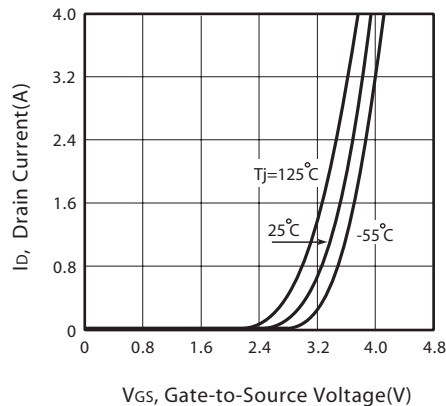


Figure 2. Transfer Characteristics

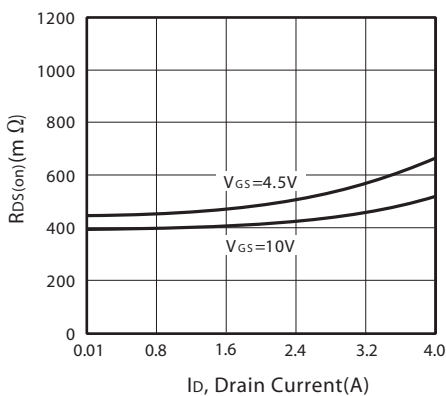


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

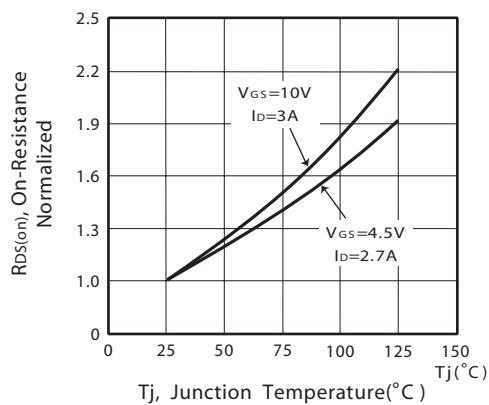


Figure 4. On-Resistance Variation with Drain Current and Temperature

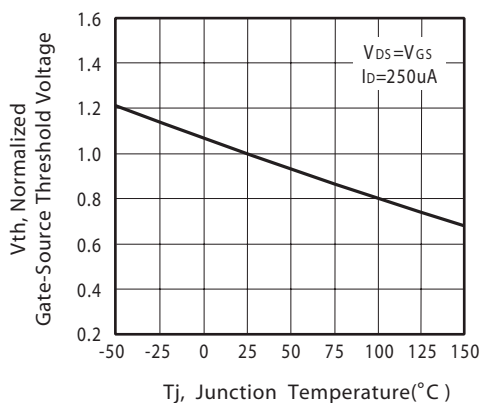


Figure 5. Gate Threshold Variation with Temperature

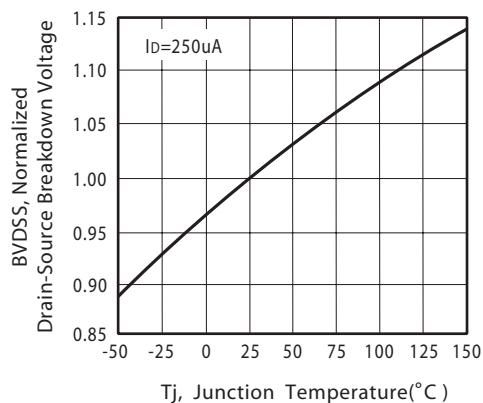


Figure 6. Breakdown Voltage Variation with Temperature

STU102S STD102S

Ver 1.0

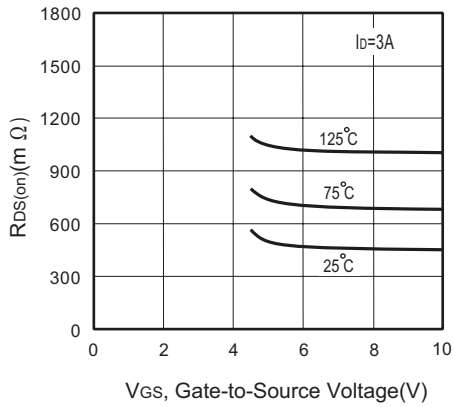


Figure 7. On-Resistance vs. Gate-Source Voltage

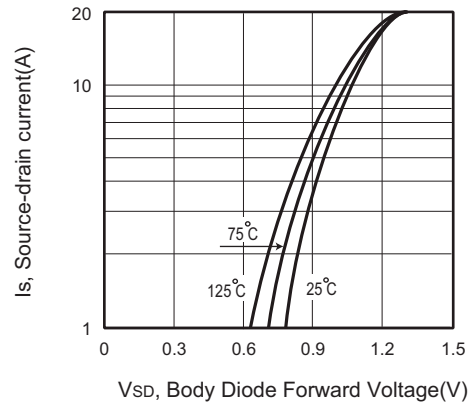


Figure 8. Body Diode Forward Voltage Variation with Source Current

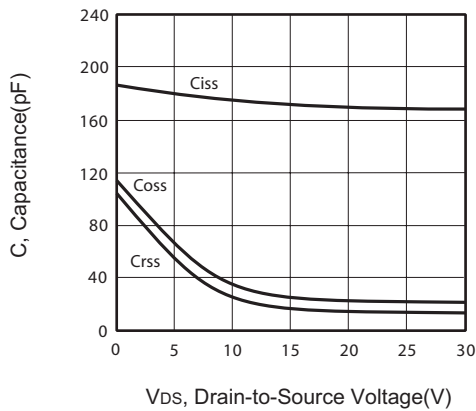


Figure 9. Capacitance

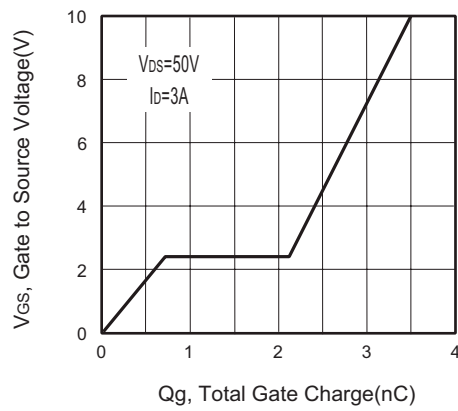


Figure 10. Gate Charge

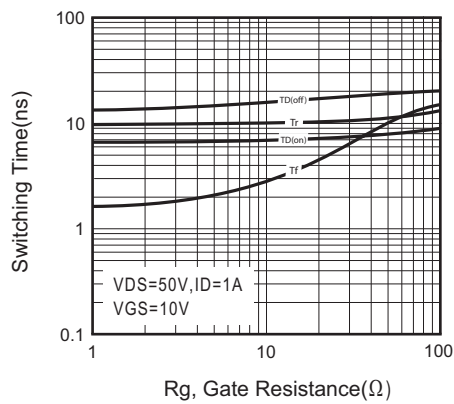


Figure 11. switching characteristics

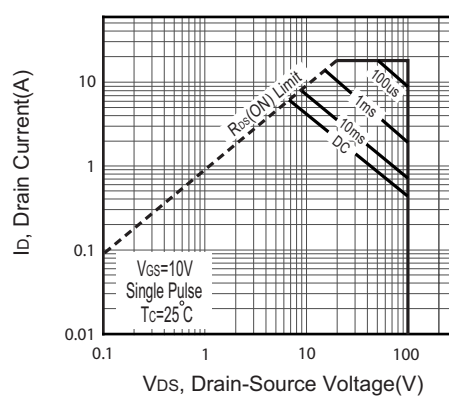
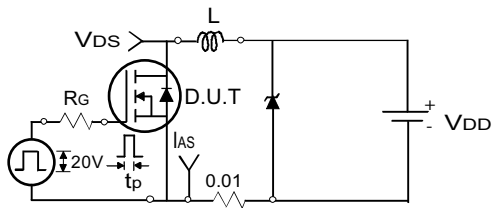


Figure 12. Maximum Safe Operating Area

Jun,09,2014

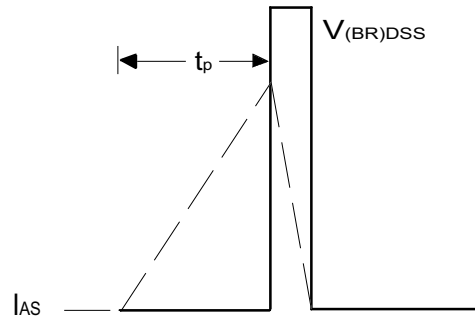
STU102S STD102S

Ver 1.0



Uncamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

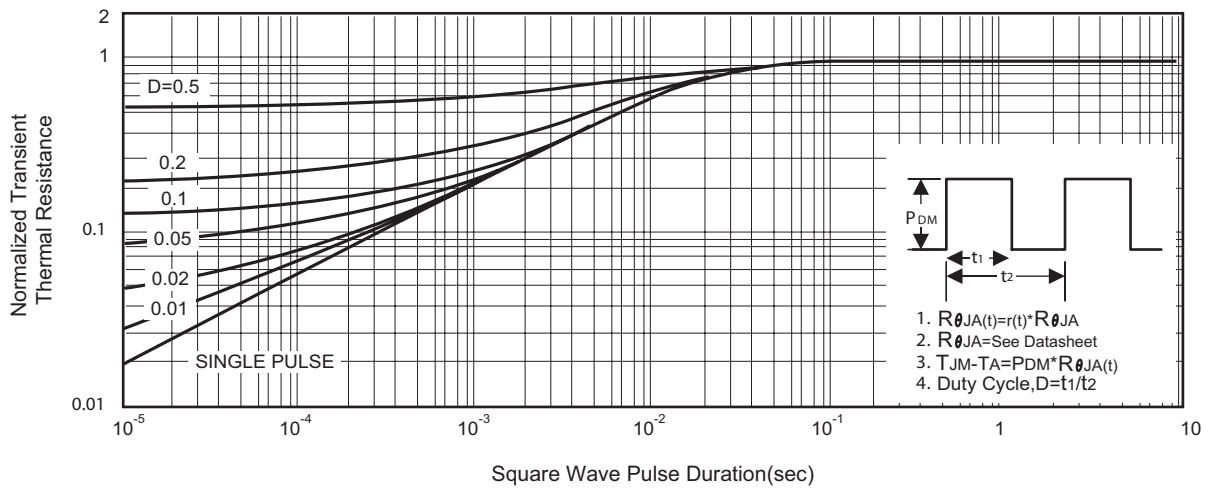


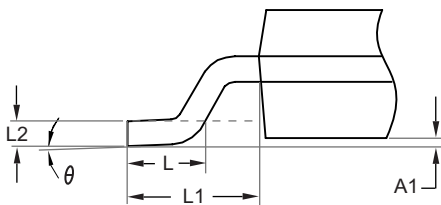
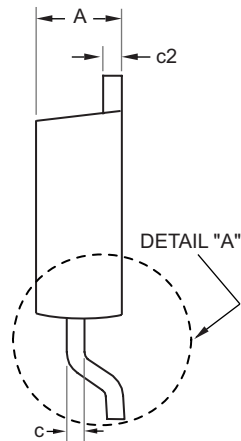
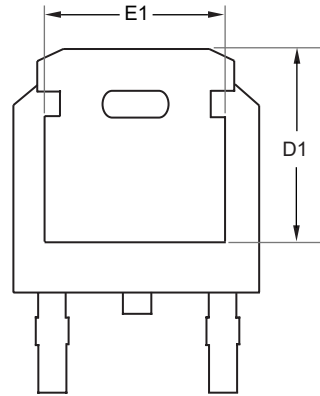
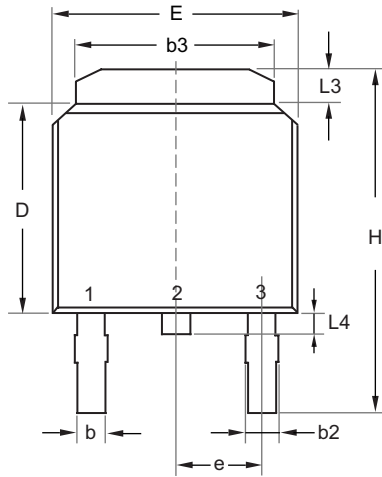
Figure 14. Normalized Thermal Transient Impedance Curve

Jun,09,2014

STU102S STD102S

Ver 1.0

TO-252



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°

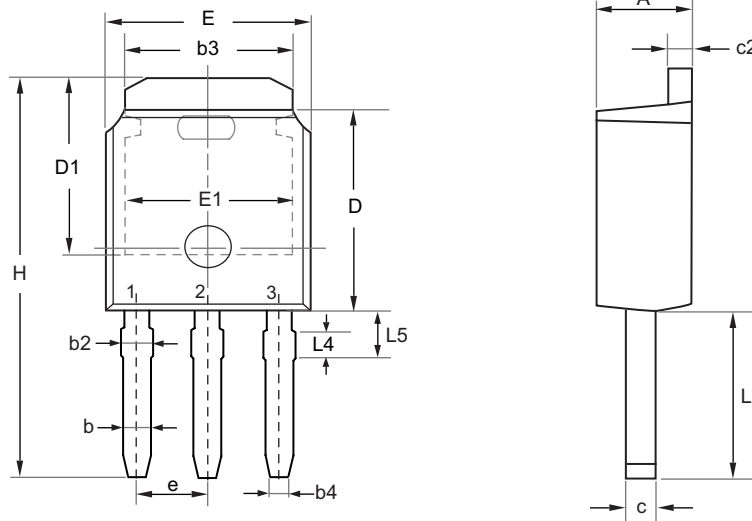
Jun,09,2014

STU102S STD102S

Ver 1.0

PACKAGE OUTLINE DIMENSIONS

TO-251



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	---

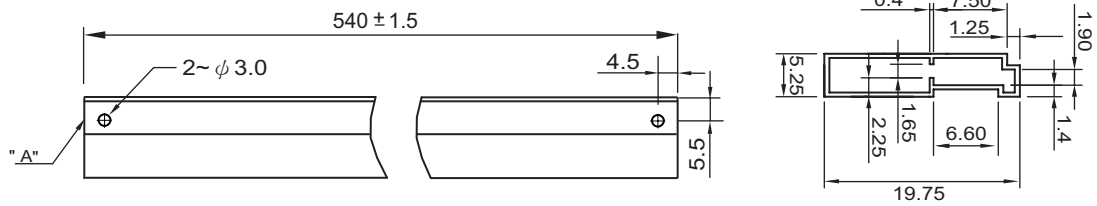
Jun,09,2014

STU102S STD102S

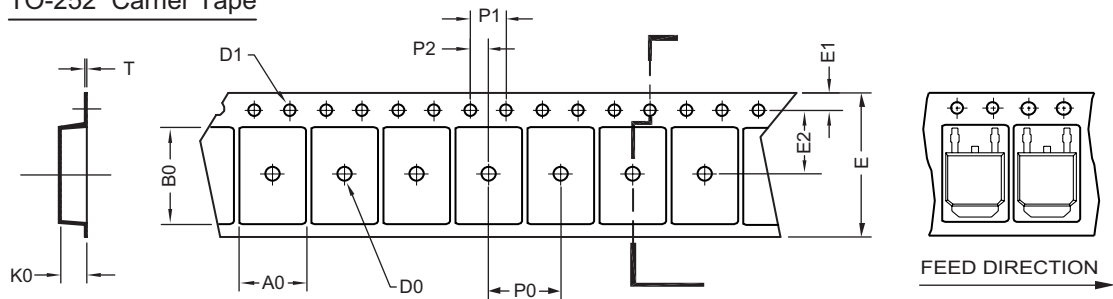
Ver 1.0

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

TO-251 Tube



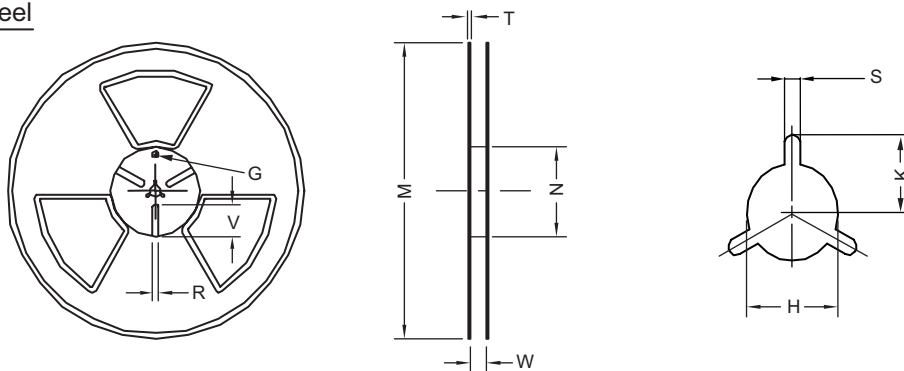
TO-252 Carrier Tape



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

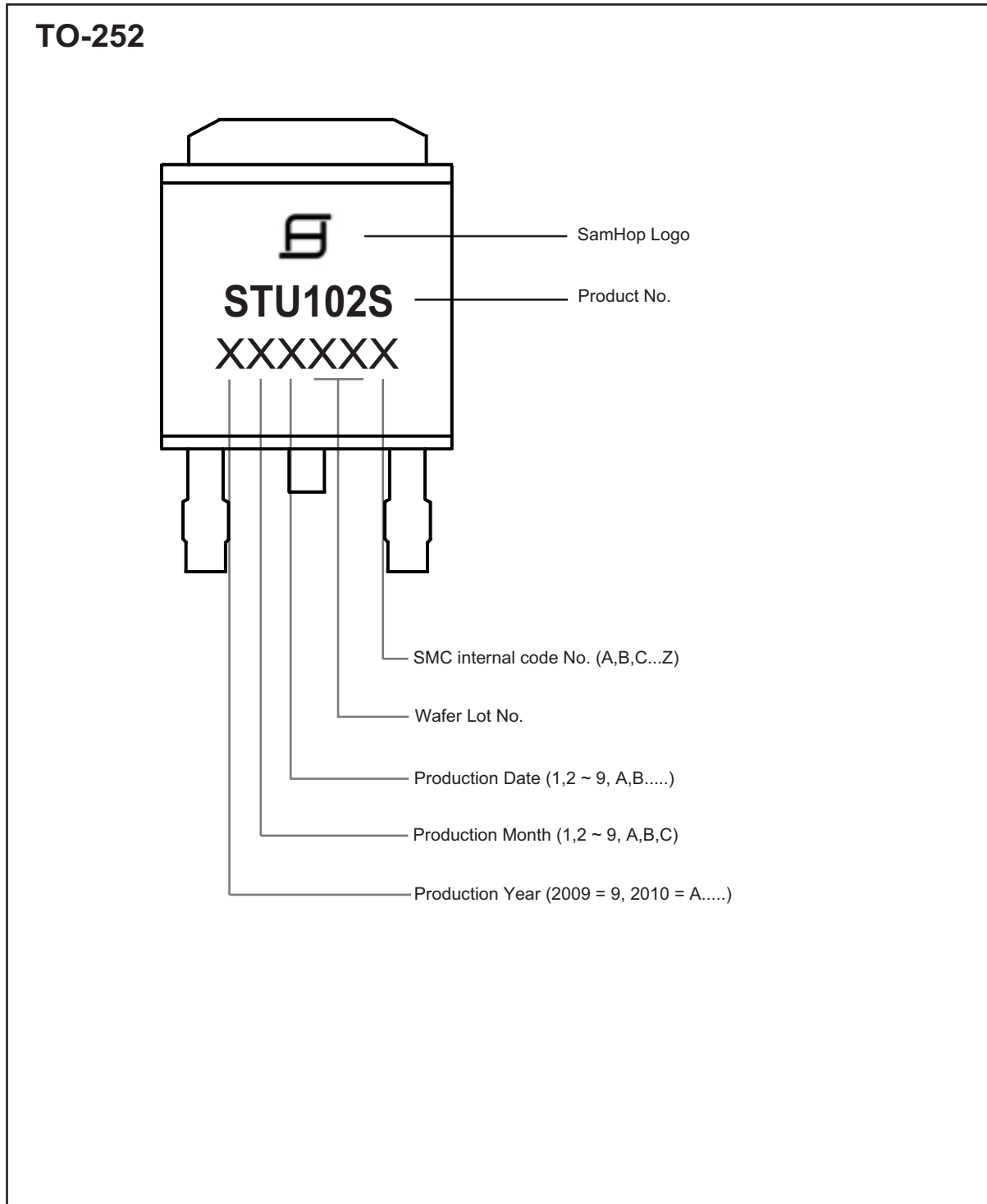
TAPE SIZE	REEL SIZE	M	N	W	T	H	K	S	G	R	V
16 mm	φ 330	φ 330 ± 0.5	φ 97 ± 1.0	17.0 + 1.5 - 0	2.2	φ 13.0 + 0.5 - 0.2	10.6	2.0 ±0.5	---	---	---

Jun,09,2014

STU102S STD102S

Ver 1.0

TOP MARKING DEFINITION

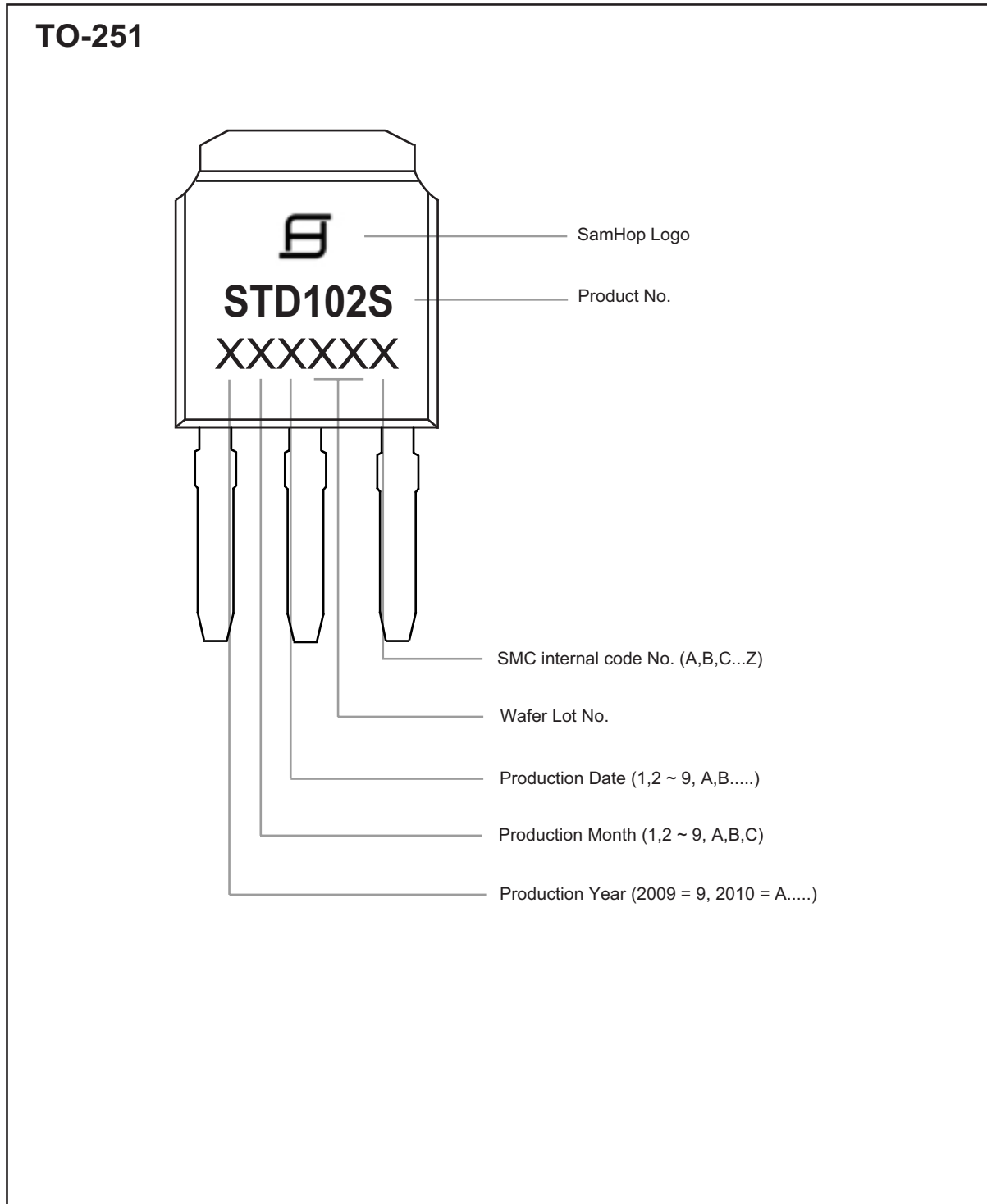


Jun,09,2014

STU102S STD102S

Ver 1.0

TOP MARKING DEFINITION



Jun,09,2014