SamHop Microelectronics Corp.

STU437S
STD437S

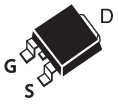
Ver 1.0

P-Channel Logic Level Enhancement Mode Field Effect Transistor

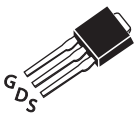
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
-40V	-32A	16 @ VGS=-10V
		30 @ VGS=-4.5V

FEATURES

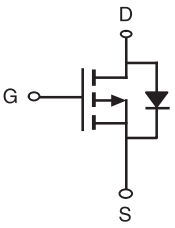
- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Suface Mount Package.



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		-40	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Drain Current-Continuous [a e]	T_C=25°C	-32	A
		T_C=70°C	-25.6	A
I_{DM}	-Pulsed [b]		-94	A
E_{AS}	Sigle Pulse Avalanche Energy [d]		121	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

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3	°C/W
$R_{\theta JA}$	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	-40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-32V , 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	-1.9	-3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V , I_D=-16A		13	16	m ohm
		V_{GS}=-4.5V , I_D=-12A		22	30	m ohm
g_{FS}	Forward Transconductance	V_{DS}=-10V , I_D=-16A		32		S
DYNAMIC CHARACTERISTICS [c]						
C_{ISS}	Input Capacitance	V_{DS}=-20V,V_{GS}=0V f=1.0MHz		2200		pF
C_{OSS}	Output Capacitance			244		pF
C_{RSS}	Reverse Transfer Capacitance			180		pF
SWITCHING CHARACTERISTICS [c]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=-20V I_D=-1.0A V_{GS}=-10V R_{GEN}= 6 ohm		36		ns
t_r	Rise Time			32		ns
$t_{D(OFF)}$	Turn-Off Delay Time			109		ns
t_f	Fall Time			28		ns
Q_g	Total Gate Charge	V_{DS}=-20V,I_D=-16A,V_{GS}=-10V		37		nC
Q_{gs}	Gate-Source Charge	V_{DS}=-20V,I_D=-16A, V_{GS}=-10V		4.3		nC
Q_{gd}	Gate-Drain Charge			12		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S= -4A		-0.8	-1.3	V

Notes

a.Surface Mounted on FR4 Board,t ≤ 10sec.
b.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.
c.Guaranteed by design, not subject to production testing.
d.Starting T_J=25°C,L=0.5mH,V_{DD} = 20V .(See Figure13)
e.Drain current limited by maximum junction temperature.

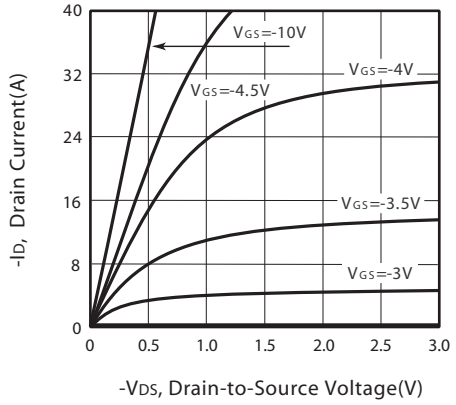


Figure 1. Output Characteristics

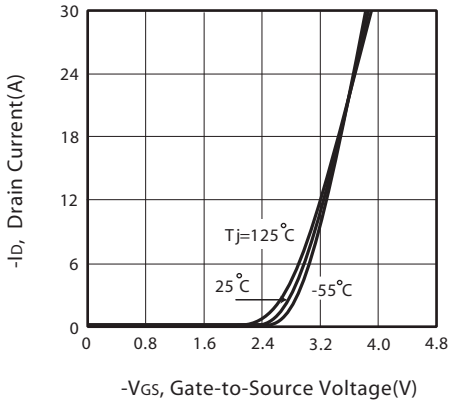


Figure 2. Transfer Characteristics

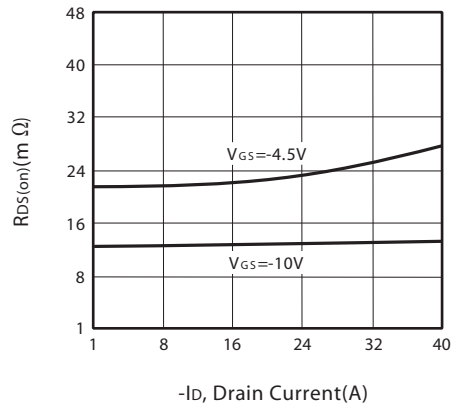


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

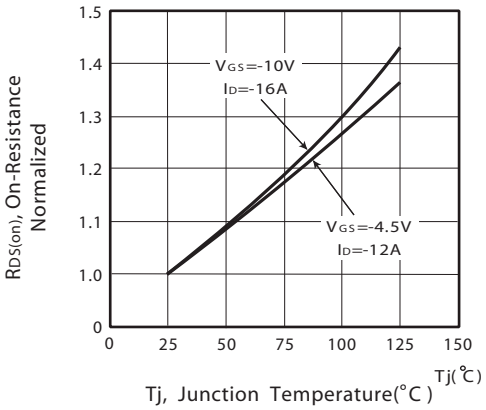


Figure 4. On-Resistance Variation with Drain Current and Temperature

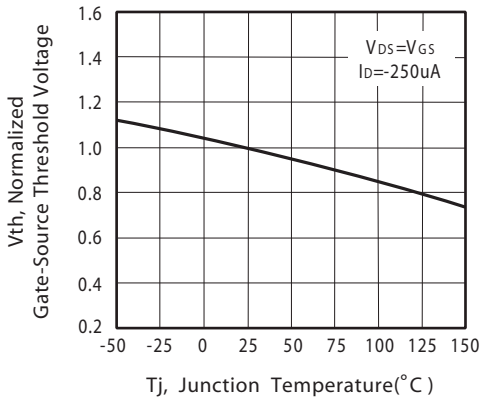


Figure 5. Gate Threshold Variation with Temperature

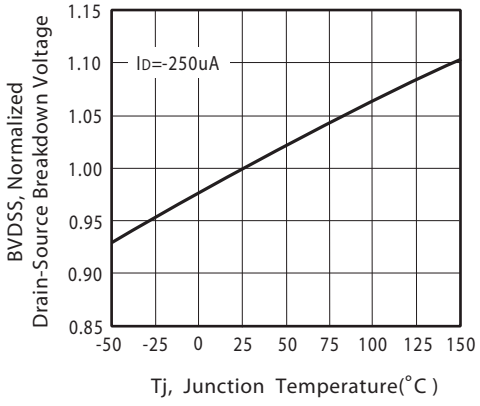


Figure 6. Breakdown Voltage Variation with Temperature

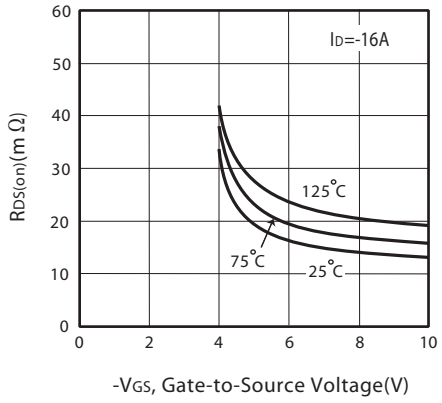


Figure 7. On-Resistance vs. Gate-Source Voltage

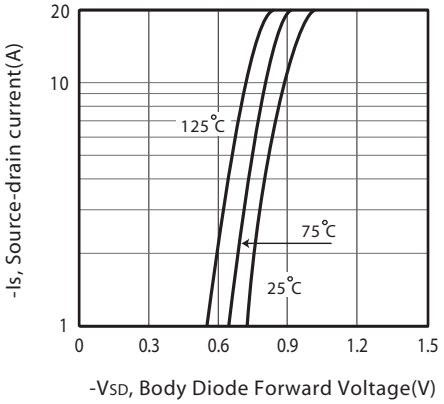


Figure 8. Body Diode Forward Voltage Variation with Source Current

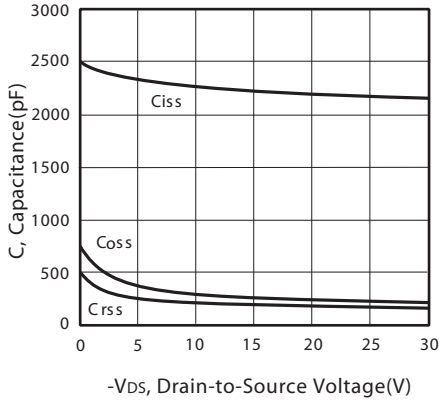


Figure 9. Capacitance

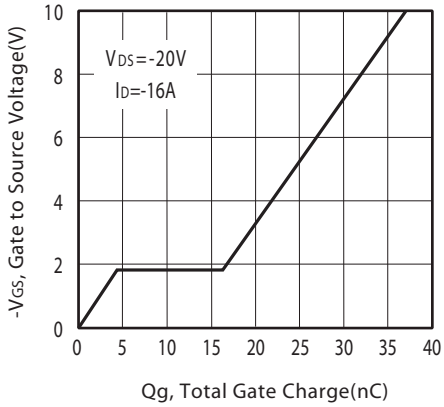


Figure 10. Gate Charge

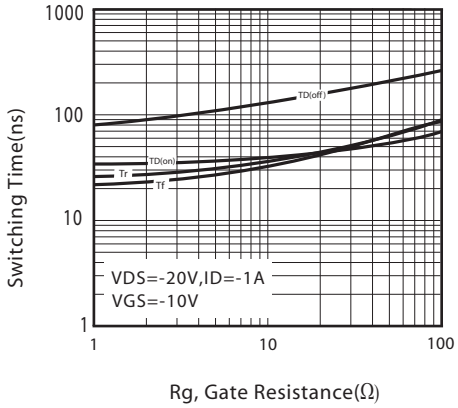


Figure 11. switching characteristics

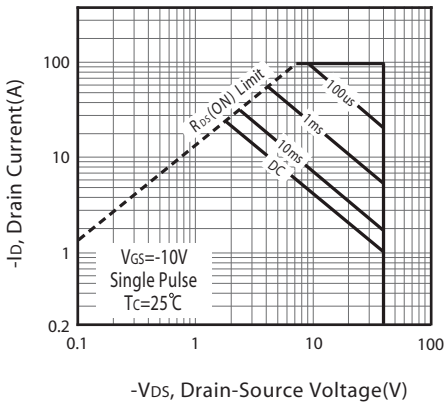
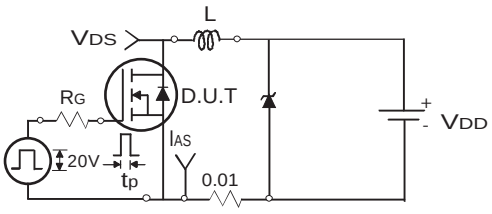
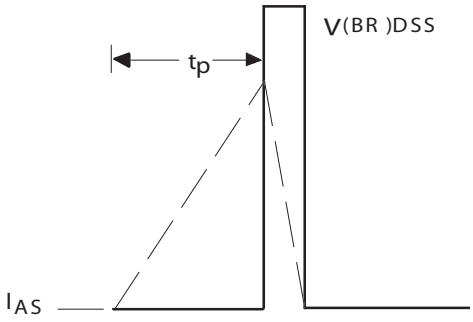


Figure 12. Maximum Safe Operating Area



Uncamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

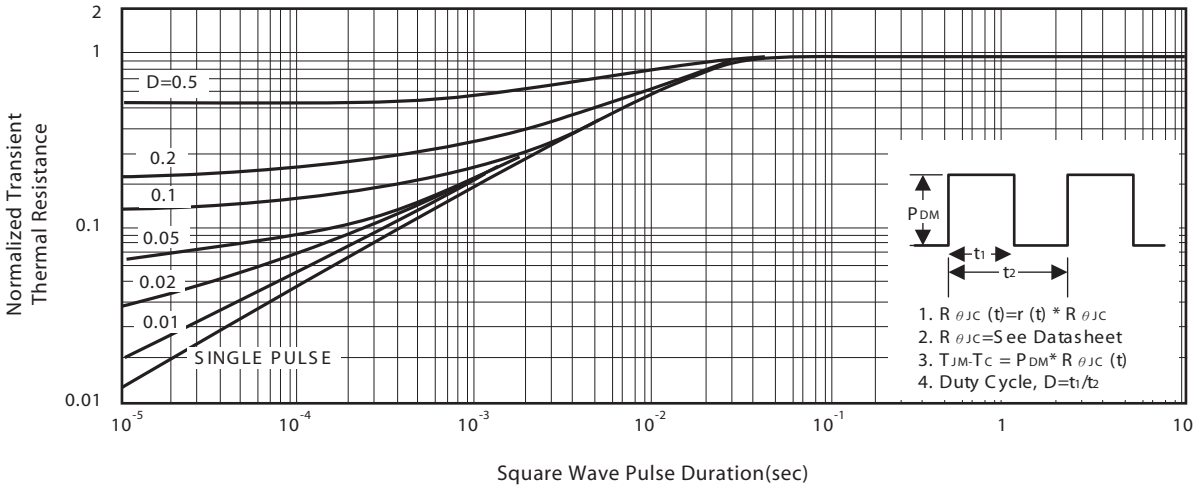
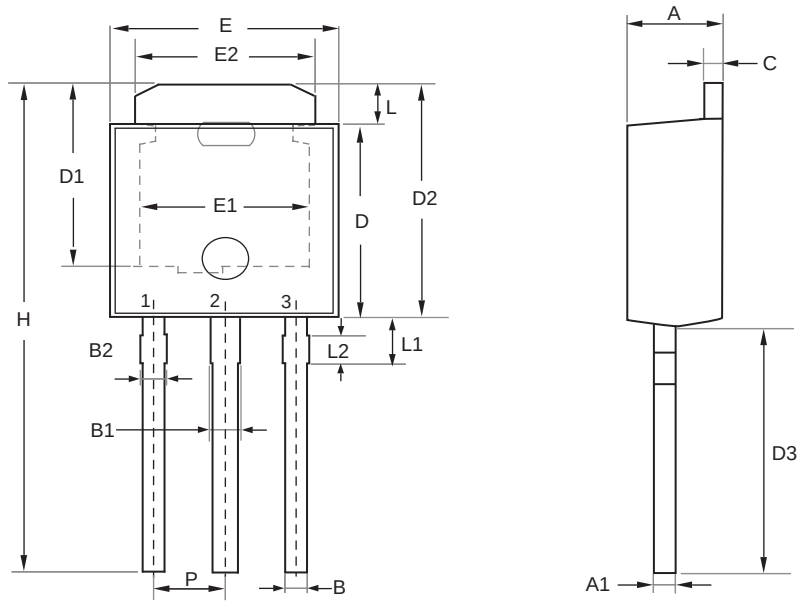


Figure 14. Normalized Thermal Transient Impedance Curve

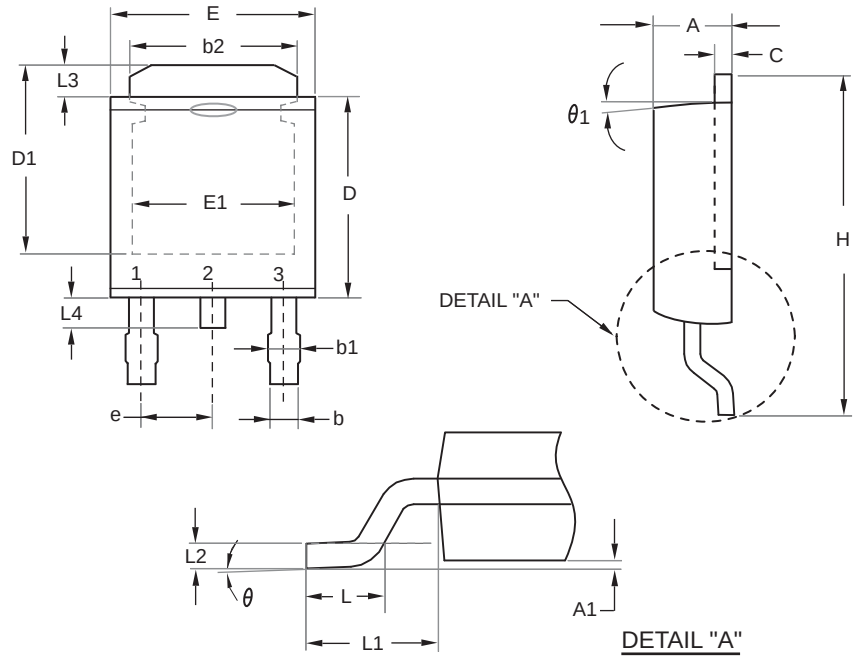
PACKAGE OUTLINE DIMENSIONS

TO-251



SYMBOL	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.100	2.500	0.083	0.098
A1	0.350	0.650	0.014	0.026
B	0.400	0.800	0.016	0.031
B1	0.650	1.050	0.026	0.041
B2	0.500	0.900	0.020	0.035
C	0.400	0.600	0.016	0.024
D	5.300	5.700	0.209	0.224
D1	4.900	5.300	0.193	0.209
D2	6.700	7.300	0.264	0.287
D3	7.000	8.000	0.276	0.315
H	10.830	11.430	0.426	0.450
E	6.300	6.700	0.248	0.264
E1	4.600	4.900	0.181	0.193
E2	4.800	5.200	0.189	0.205
L	1.300	1.700	0.051	0.067
L1	1.400	1.800	0.055	0.071
L2	0.500	0.900	0.020	0.035
P	2.300 BSC		0.091 BSC	

TO-252

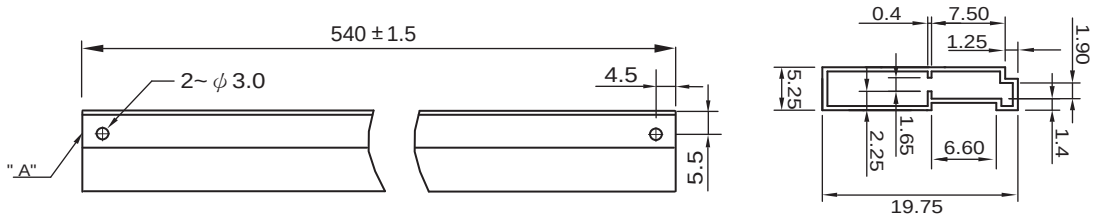


DETAIL "A"

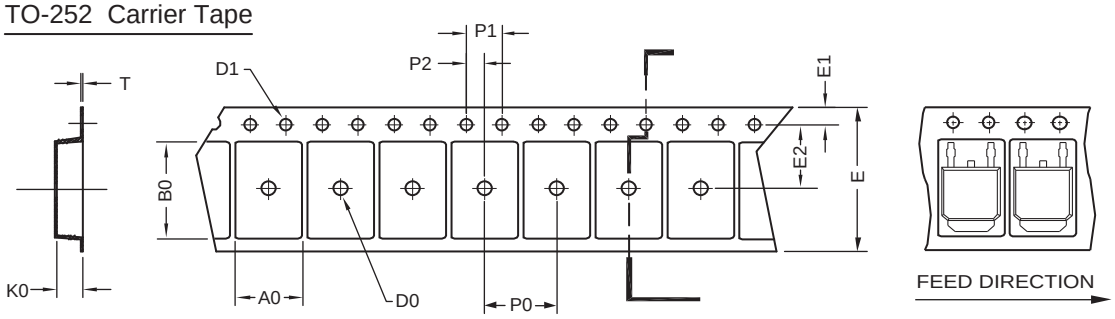
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.100	2.500	0.083	0.098
A1	0.000	0.200	0.000	0.008
b	0.400	0.889	0.016	0.035
b1	0.770	1.140	0.030	0.045
b2	4.800	5.460	0.189	0.215
C	0.400	0.600	0.016	0.024
D	5.300	6.223	0.209	0.245
D1	4.900	5.515	0.193	0.217
E	6.300	6.731	0.248	0.265
E1	4.400	5.004	0.173	0.197
e	2.290 REF		0.090 BSC	
H	8.900	10.400	0.350	0.409
L	1.397	1.770	0.055	0.070
L1	2.743 REF.		0.108 REF.	
L2	0.508 REF.		0.020 REF.	
L3	0.890	1.700	0.035	0.067
L4	0.500	1.100	0.020	0.043
θ	0°	10°	0°	10°
θ1	7° REF.		7° REF.	

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

TO-251 Tube



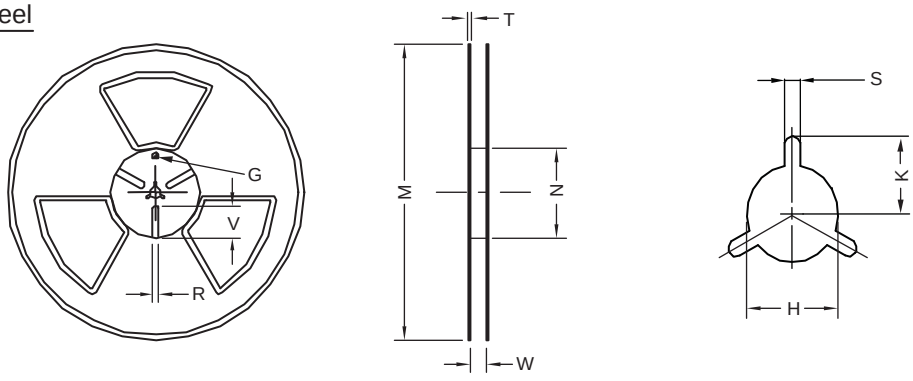
TO-252 Carrier Tape



UNIT:㎜

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
TO-252 (16 ㎜)	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

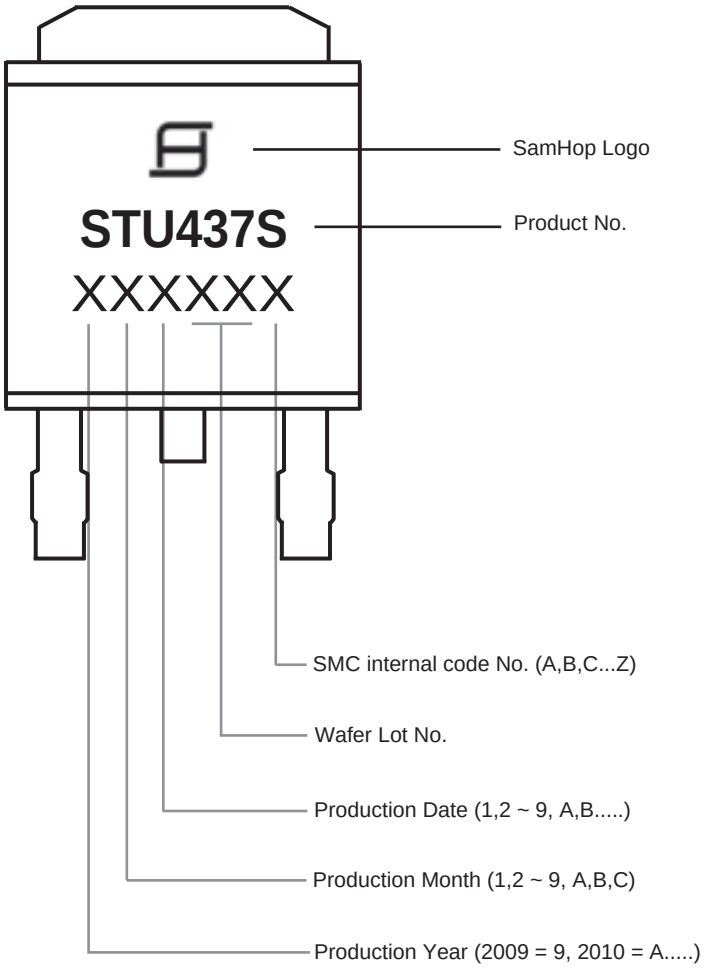


UNIT:㎜

TAPE SIZE	REEL SIZE	M	N	W	T	H	K	S	G	R	V
16 ㎜	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	---	---	---

TOP MARKING DEFINITION

TO-252



TOP MARKING DEFINITION

TO-251

