SamHop Microelectronics Corp.

SDU/D06N60

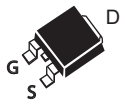
Ver 1.0

N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (Ω) Typ
600V	6A	1.18 @ VGS=10V

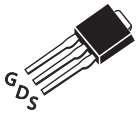
FEATURES

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

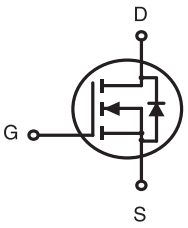


SDU SERIES
TO-252(D-PAK)

SDD SERIES
TO-251S(I-PAK)



SDD SERIES
TO-251L(I-PAK)



ORDERING INFORMATION

Ordering Code	Package	Marking Code	Delivery Mode	RoHS Status
SDU06N60HZ	TO-252	SDU06N60	Reel	Halogen Free
SDD06N60HS	TO-251S	SDD06N60	Tube	Halogen Free
SDD06N60HL	TO-251L	SDD06N60	Tube	Halogen Free

ABSOLUTE MAXIMUM RATINGS (T_C=25°C unless otherwise noted)

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		600	V
V_{GS}	Gate-Source Voltage		±30	V
I_D	Drain Current-Continuous [c]	T_C=25°C	6	A
		T_C=100°C	4.2	A
I_{DM}	-Pulsed [a c]		18	A
E_{AS}	Single Pulse Avalanche Energy [d]		430	mJ
P_D	Maximum Power Dissipation	T_C=25°C	83	W
		T_C=100°C	42	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 175	°C

THERMAL CHARACTERISTICS

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.8	°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	600			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=480V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±30V , V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	2	3	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=3A		1.18	1.48	ohm
g_{FS}	Forward Transconductance	V_{DS}=10V , I_D=3A		9		S
DYNAMIC CHARACTERISTICS [b]						
C_{ISS}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHz		950		pF
C_{OSS}	Output Capacitance			91		pF
C_{RSS}	Reverse Transfer Capacitance			13		pF
SWITCHING CHARACTERISTICS [b]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=300V I_D=1A V_{GS}=10V R_{GEN}= 6 ohm		30		ns
t_r	Rise Time			16		ns
$t_{D(OFF)}$	Turn-Off Delay Time			50		ns
t_f	Fall Time			15		ns
Q_g	Total Gate Charge	V_{DS}=300V,I_D=1A,V_{GS}=10V		15		nC
Q_{gs}	Gate-Source Charge	V_{DS}=300V,I_D=1A, V_{GS}=10V		2.4		nC
Q_{gd}	Gate-Drain Charge			5.8		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=4A		0.8	1.4	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.Starting T_J=25°C,L=60mH,V_{DD} = 50V.(See Figure13)
e.Mounted on FR4 Board of 1 inch^2 , 2oz copper.

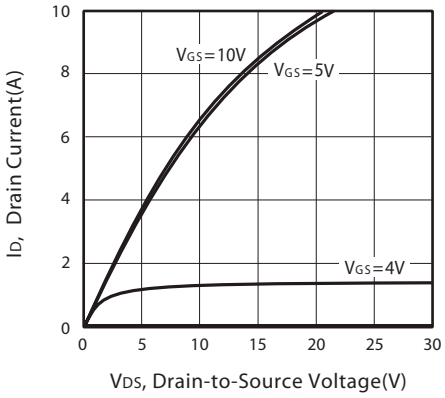


Figure 1. Output Characteristics

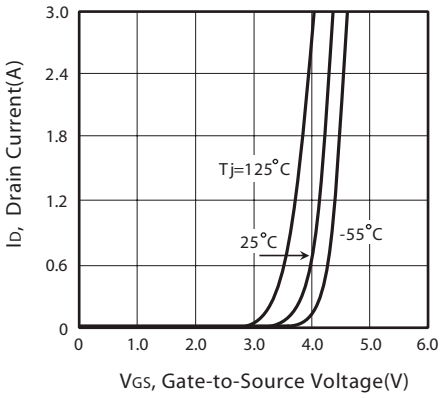


Figure 2. Transfer Characteristics

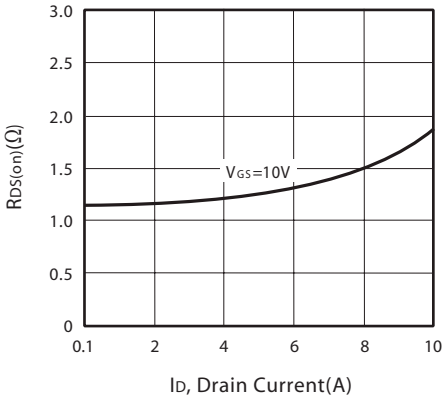


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

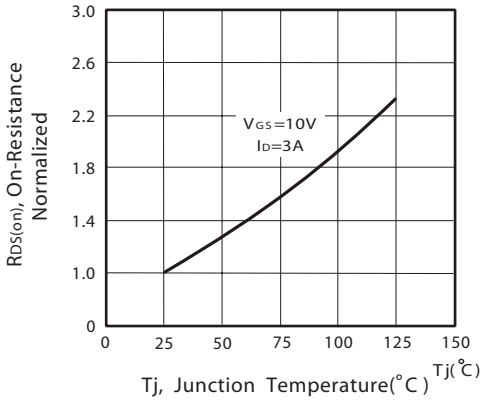


Figure 4. On-Resistance Variation with Drain Current and Temperature

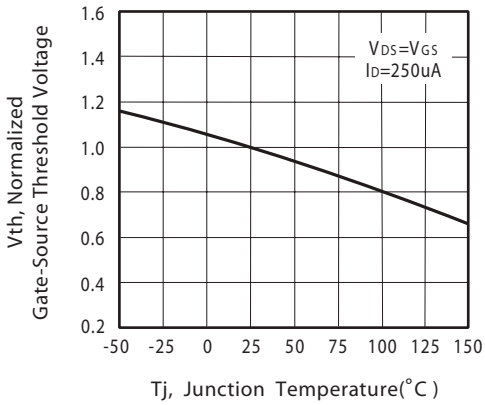


Figure 5. Gate Threshold Variation with Temperature

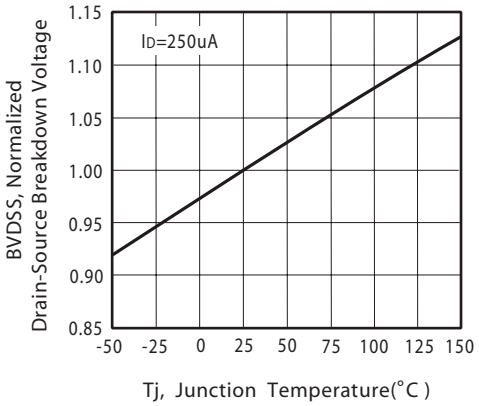


Figure 6. Breakdown Voltage Variation with Temperature

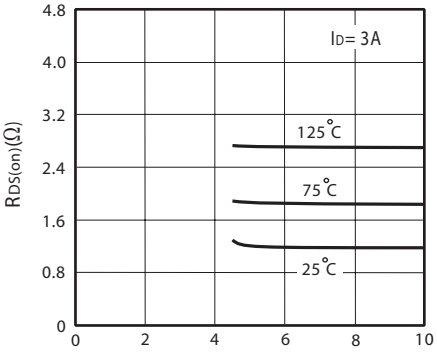


Figure 7. On-Resistance vs. Gate-Source Voltage

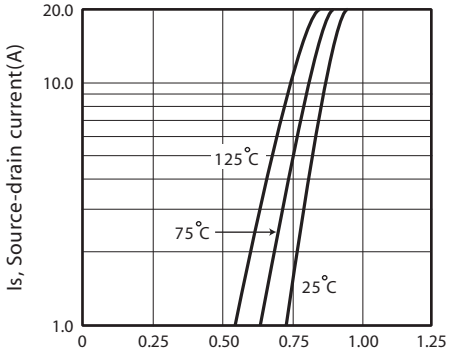


Figure 8. Body Diode Forward Voltage Variation with Source Current

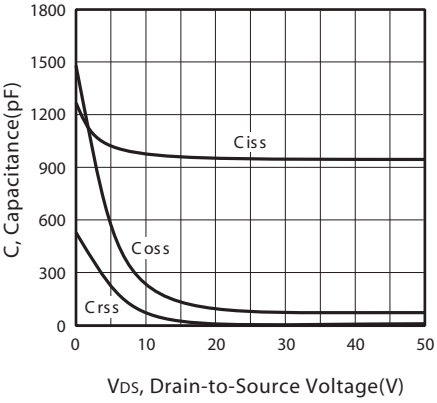


Figure 9. Capacitance

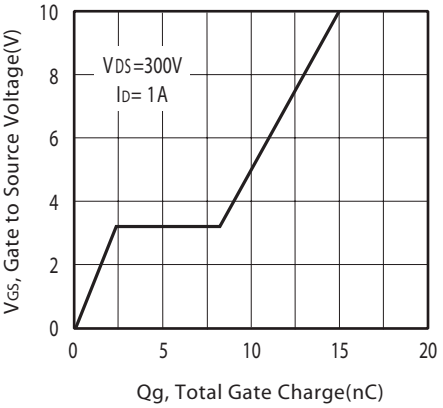


Figure 10. Gate Charge

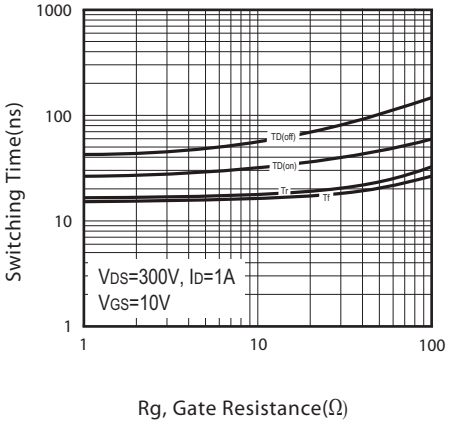


Figure 11. switching characteristics

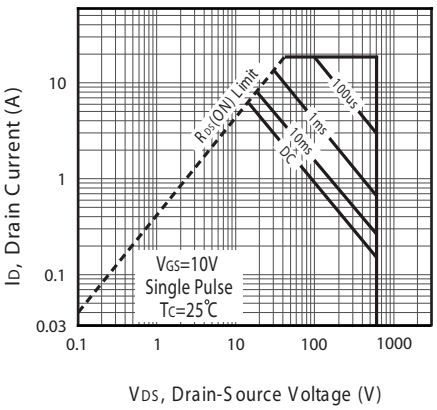
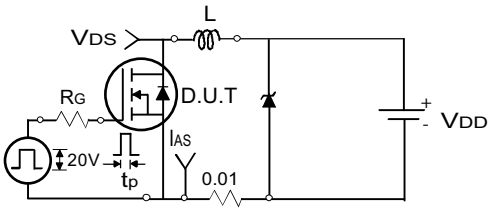
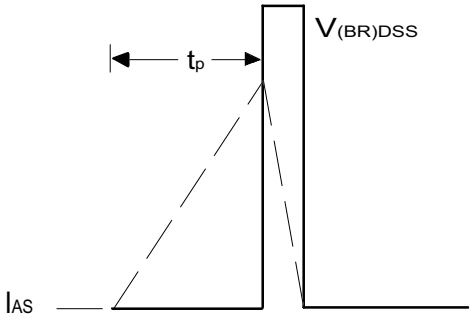


Figure 12. Maximum Safe Operating Area



Uncamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

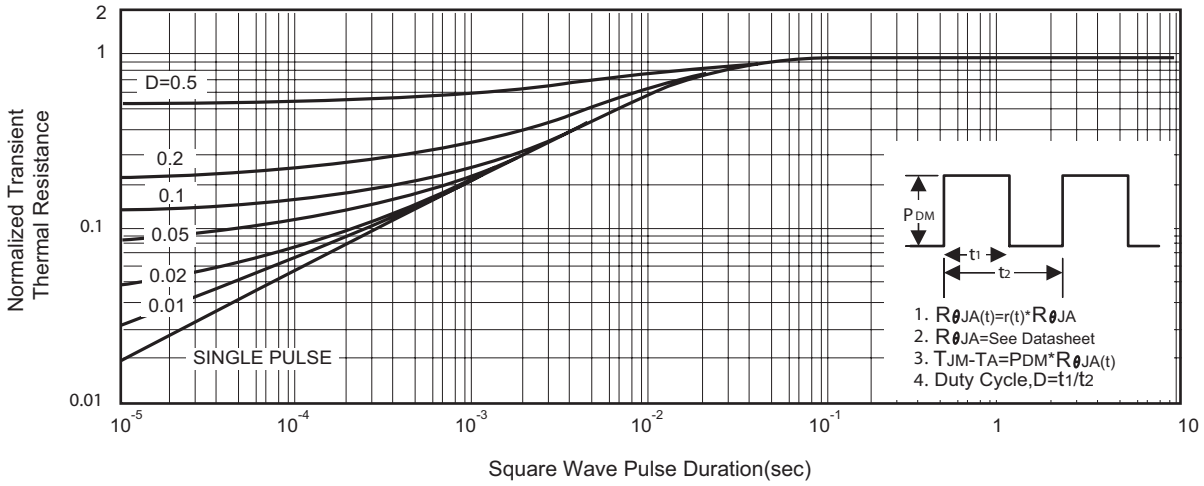
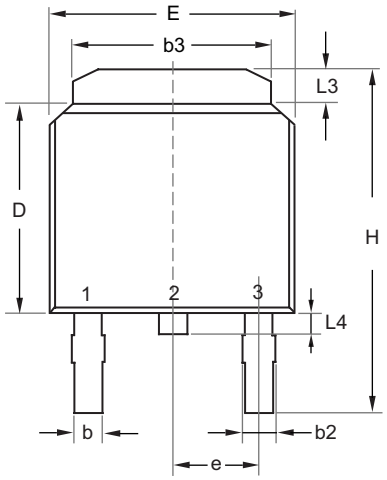
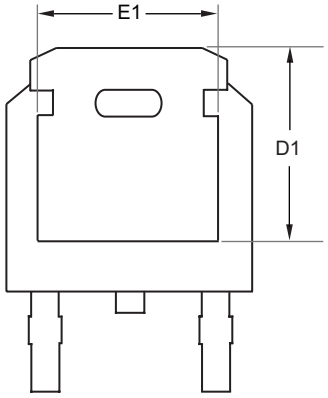
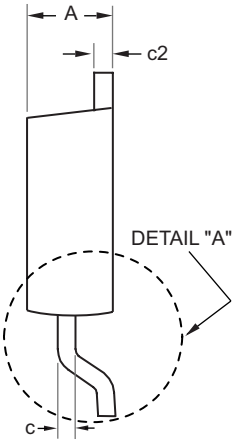


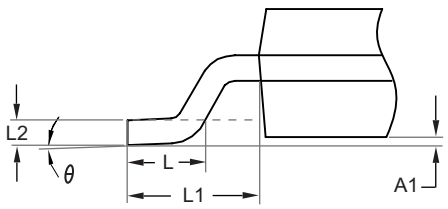
Figure 14. Normalized Thermal Transient Impedance Curve

TO-252







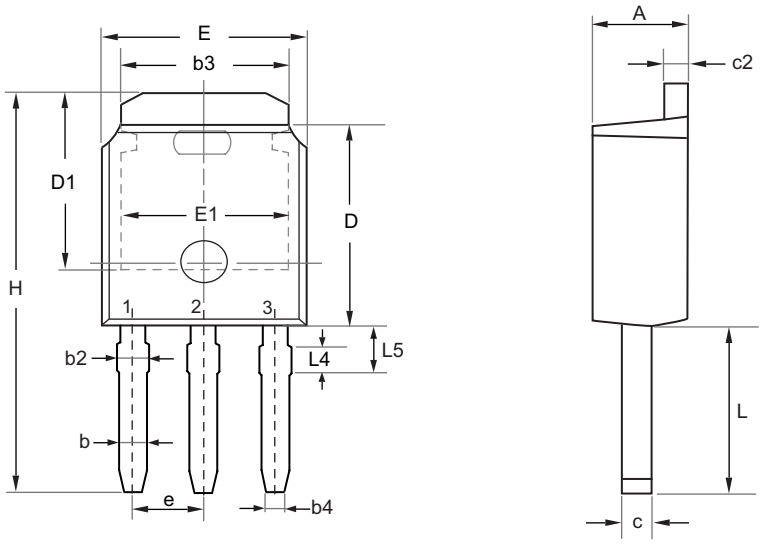


DETAIL "A"

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°

PACKAGE OUTLINE DIMENSIONS

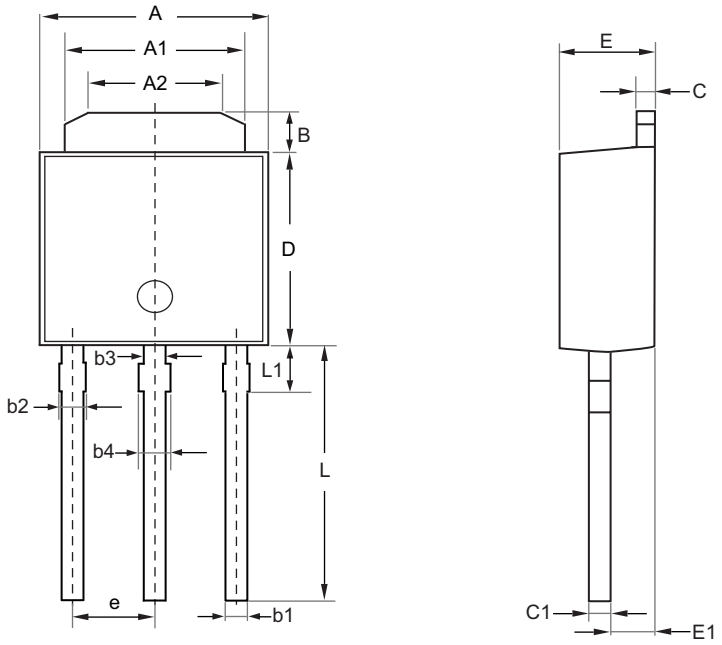
TO-251S



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	---

PACKAGE OUTLINE DIMENSIONS

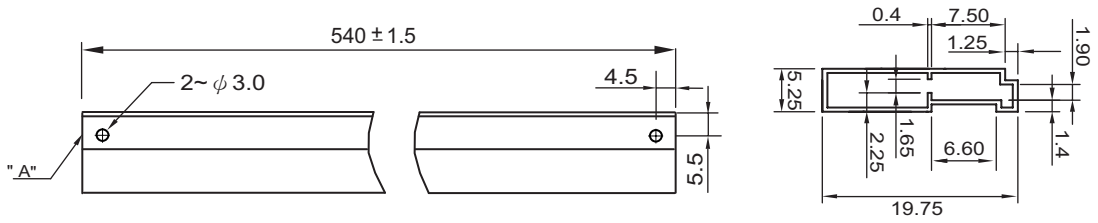
TO-251L



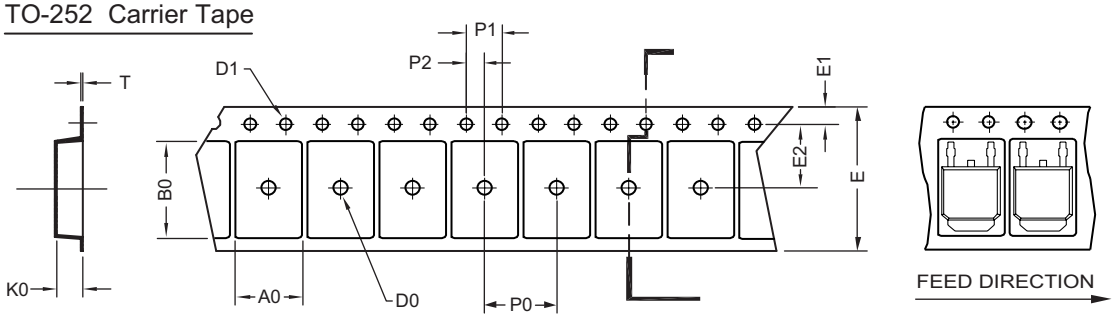
SYMBOL	MILLIMETERS		
	MIN	NOM	MAX
A	6.40	6.50	6.60
A1	5.30	5.40	5.50
A2	4.30	4.40	4.50
B	1.35	1.50	1.65
L1		1.55 REF	
L	7.40	7.70	8.00
D	5.40	5.55	5.70
C	0.55	0.60	0.65
C1	0.49	0.54	0.59
E1	1.72	1.77	1.82
E	2.20	2.30	2.40
b1	0.60	——	0.75
b2	0.70	——	0.85
b3		0.80	
b4		0.90	
e		2.30	

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

TO-251 Tube



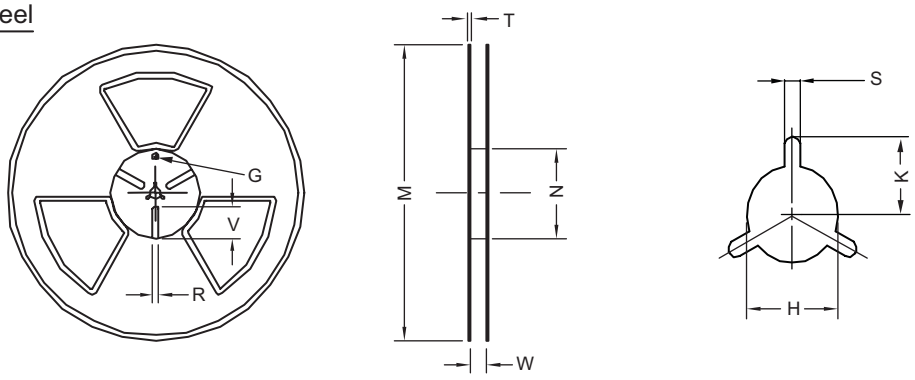
TO-252 Carrier Tape



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

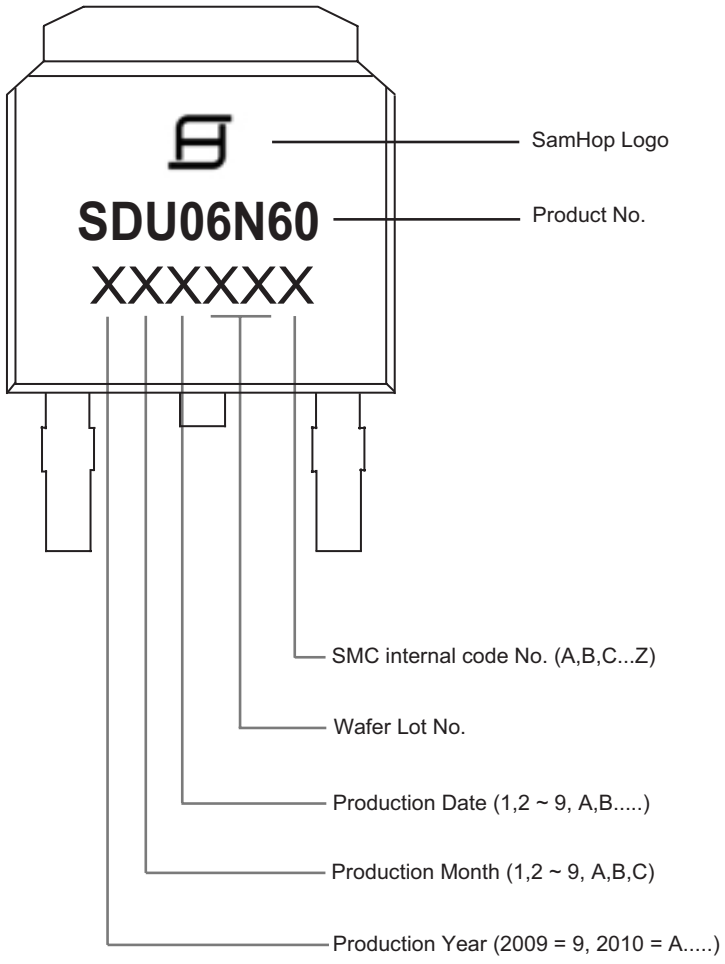


UNIT:㎜

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	---	---	---

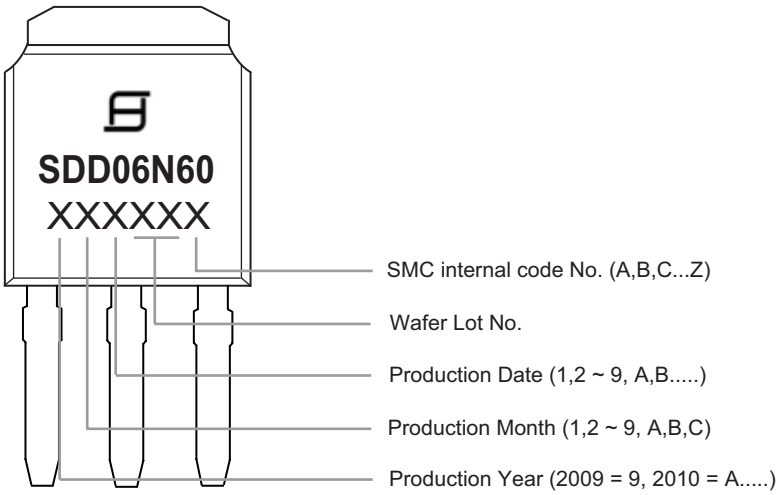
TOP MARKING DEFINITION

TO-252



TOP MARKING DEFINITION

TO-251S



TO-251L