



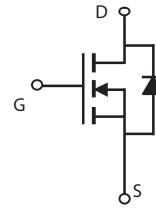
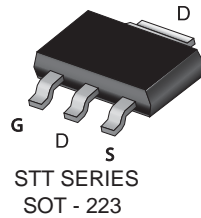
## N-Channel Logic Level Enhancement Mode Field Effect Transistor

### PRODUCT SUMMARY

V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
30V	7.5A	29 @ V <sub>GS</sub> =10V
		42 @ V <sub>GS</sub> =4.5V

### FEATURES

- Super high dense cell design for low R<sub>DS(ON)</sub>.
- Rugged and reliable.
- Surface Mount Package.



### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Limit	Units
V <sub>DS</sub>	Drain-Source Voltage	30	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current-Continuous <sup>c</sup>	T <sub>A</sub> =25°C	7.5
		T <sub>A</sub> =70°C	6.0
I <sub>DM</sub>	-Pulsed <sup>a c</sup>	50	A
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>d</sup>	12	mJ
P <sub>D</sub>	Maximum Power Dissipation	T <sub>A</sub> =25°C	3
		T <sub>A</sub> =70°C	1.9
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature Range	-55 to 150	°C

### THERMAL CHARACTERISTICS

R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient	42	°C/W
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## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =24V , V <sub>GS</sub> =0V			1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±100	nA
ON CHARACTERISTICS						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1	2	3	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =3.8A		23	29	m ohm
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =3.1A		31	42	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V , I <sub>D</sub> =3.8A		17		S
DYNAMIC CHARACTERISTICS °						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V f=1.0MHz		300		pF
C <sub>oss</sub>	Output Capacitance			66		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			51		pF
SWITCHING CHARACTERISTICS °						
t <sub>D(ON)</sub>	Turn-On Delay Time	V <sub>DD</sub> =15V I <sub>D</sub> =1A V <sub>GS</sub> =10V R <sub>GEN</sub> = 6 ohm		9.6		ns
t <sub>r</sub>	Rise Time			12		ns
t <sub>D(OFF)</sub>	Turn-Off Delay Time			16		ns
t <sub>f</sub>	Fall Time			6		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =3.8A, V <sub>GS</sub> =10V		5.5		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =15V, I <sub>D</sub> =3.8A, V <sub>GS</sub> =10V		1		nC
Q <sub>gd</sub>	Gate-Drain Charge			2		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A		0.77	1.2	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 <sub>J</sub> =25°C, L=0.5mH, V <sub>DD</sub> = 20V. (See Figure13)						
e. Mounted on FR4 Board of 1 inch <sup>2</sup> , 2oz.						

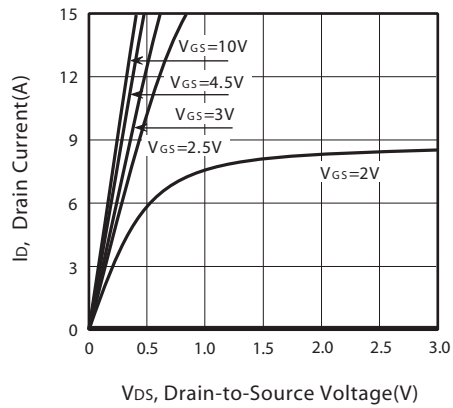


Figure 1. Output Characteristics

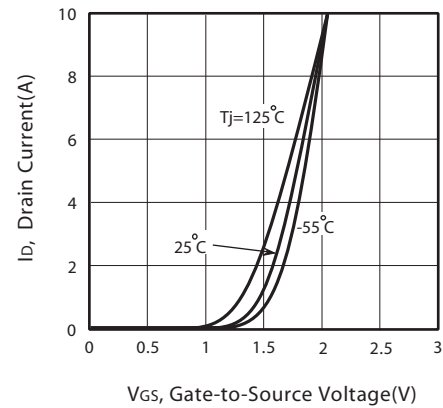


Figure 2. Transfer Characteristics

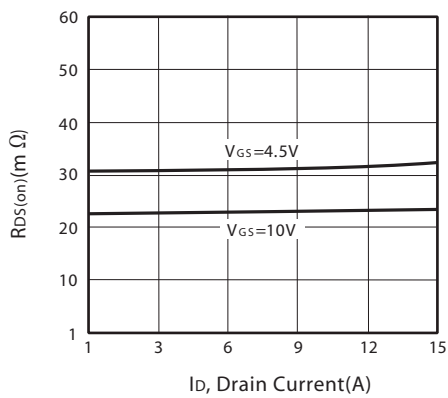


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

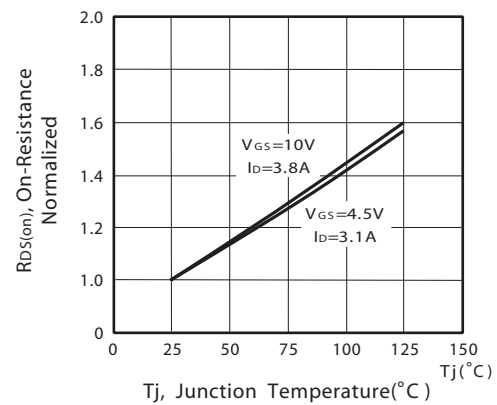


Figure 4. On-Resistance Variation with Drain Current and Temperature

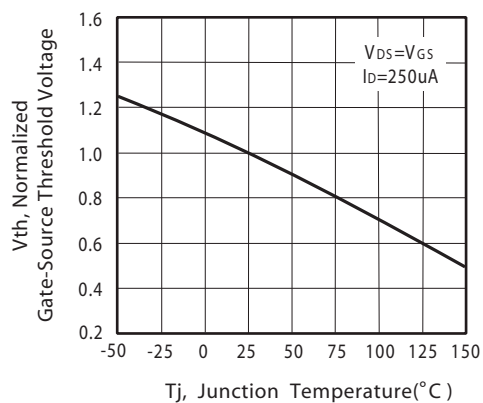


Figure 5. Gate Threshold Variation with Temperature

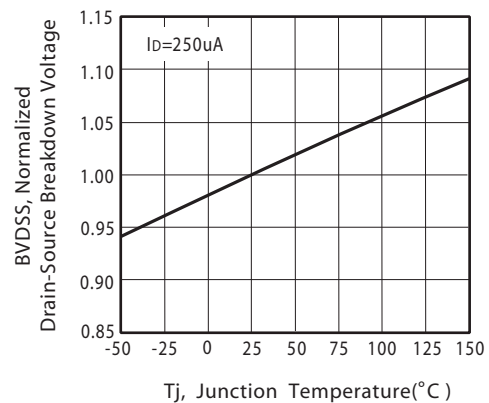


Figure 6. Breakdown Voltage Variation with Temperature

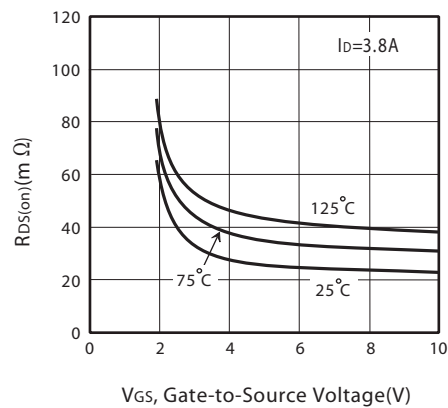


Figure 7. On-Resistance vs. Gate-Source Voltage

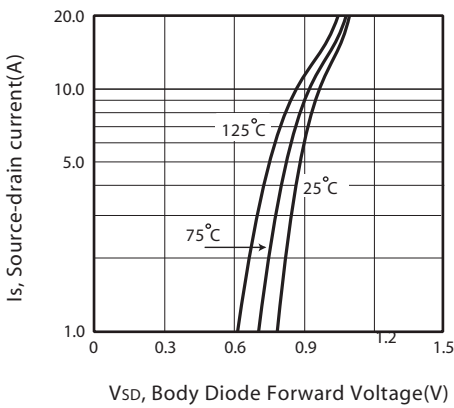


Figure 8. Body Diode Forward Voltage Variation with Source Current

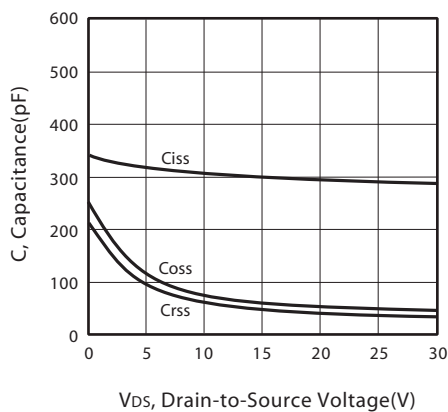


Figure 9. Capacitance

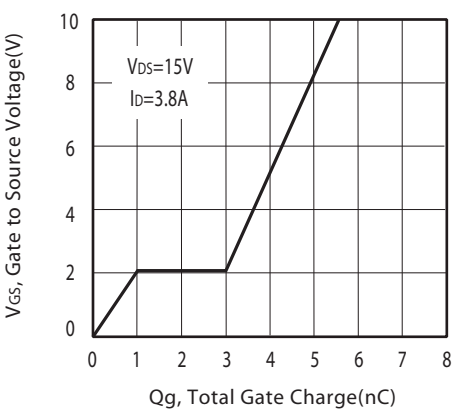


Figure 10. Gate Charge

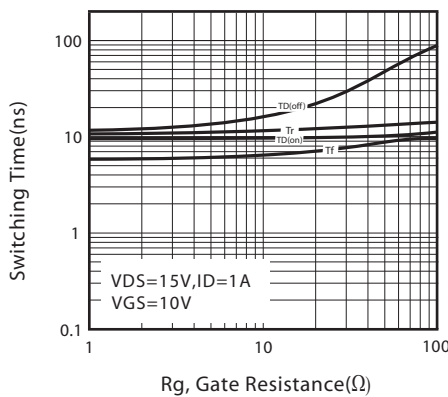


Figure 11. switching characteristics

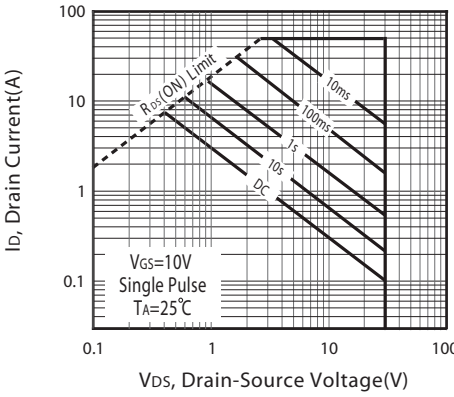
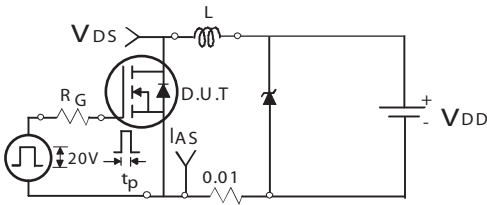
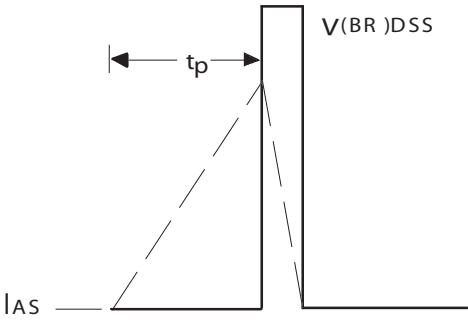


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

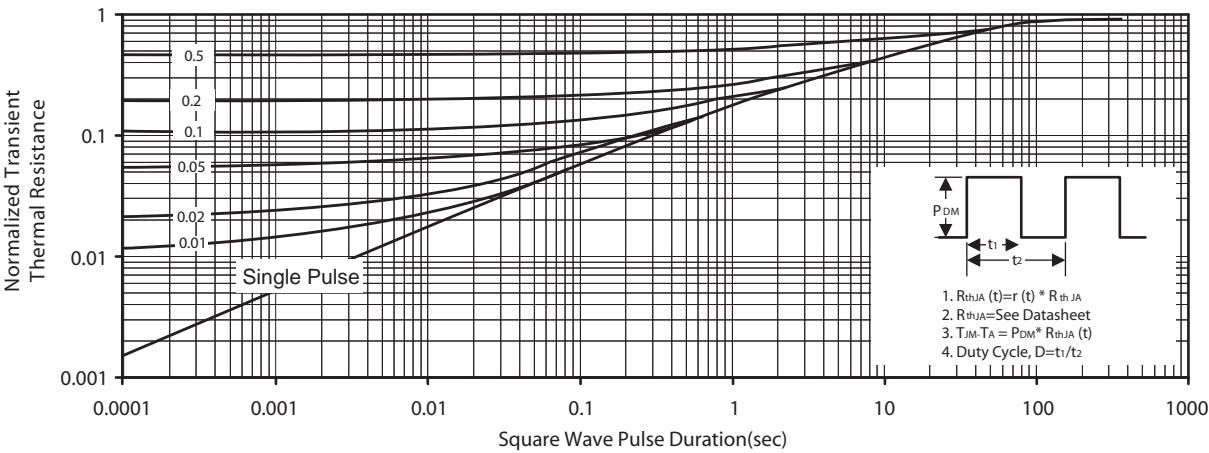
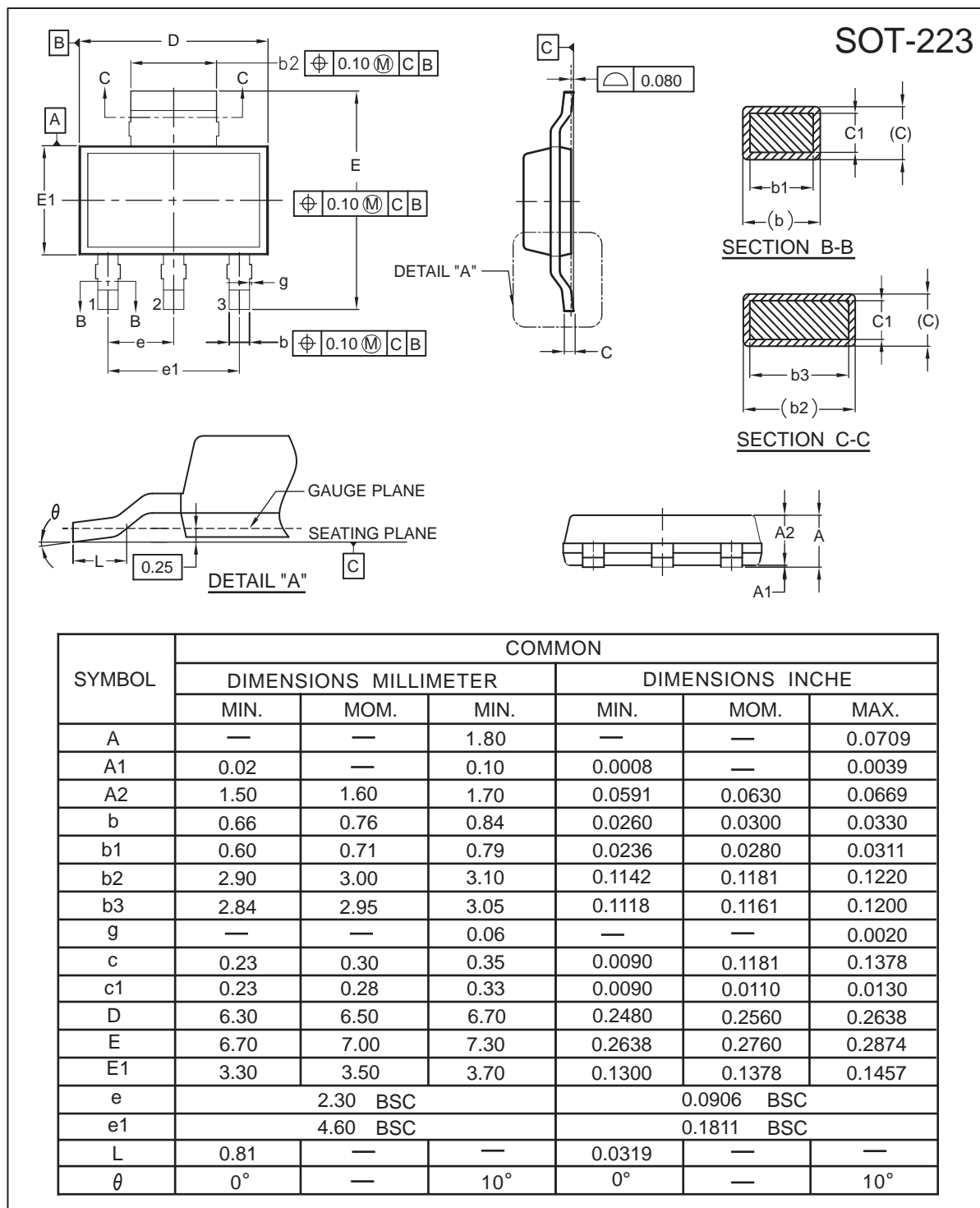
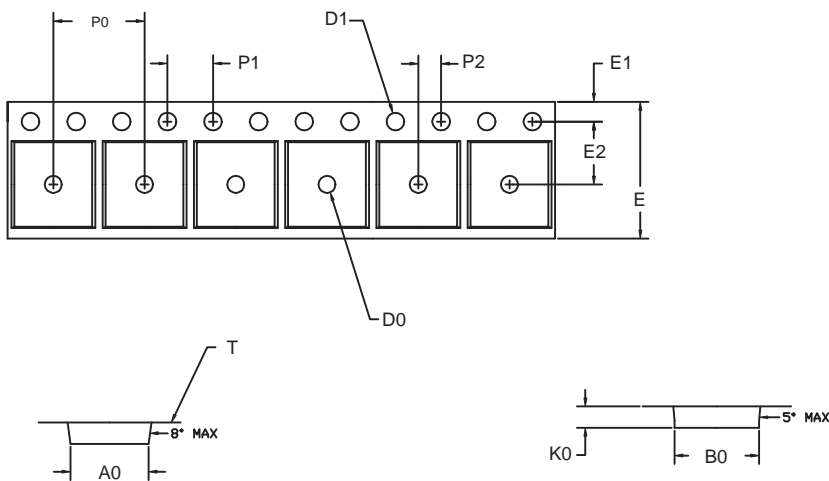


Figure 14. Normalized Thermal Transient Impedance Curve



SOT-223 Tape and Reel Data

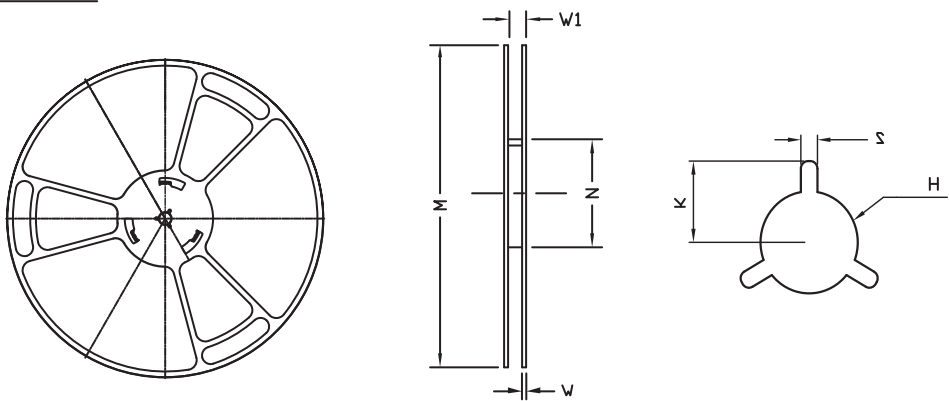
SOT-223 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
---	6.83 ±0.1	7.42 ±0.1	1.88 ±0.1	1.50 +0.25	1.60 +0.1	12.0 +0.3 -0.1	1.75 ±0.1	5.50 ±0.5	8.0 ±0.1	4.00 ±0.1	2.00 ±0.05	0.292 ±0.02

SOT-223 Reel



UNIT:mm

REEL SIZE	M	N	W	W1	H	K	S	G	R	V
φ 330 ± 0.5	---	φ 97.0 ± 1.0	2.2	13.0 + 1.5	φ 13.0 + 0.5 - 0.2	10.6	2.0 ± 0.5	---	---	---

## TOP MARKING DEFINITION

### SOT-223

