



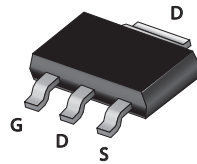
N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

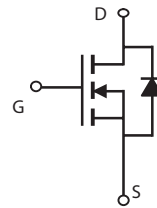
VDSS	ID	RDS(ON) (mΩ) Max
30V	7A	33 @ VGS=10V
		42 @ VGS=4.5V
		57 @ VGS=2.5V

FEATURES

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



STT SERIES
SOT-223



ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current-Continuous ^a	$T_A=25^\circ\text{C}$	7
		$T_A=70^\circ\text{C}$	5.6
I_{DM}	-Pulsed ^b	28	A
E_{AS}	Single Pulse Avalanche Energy ^d	9	mJ
P_D	Maximum Power Dissipation ^a	$T_A=25^\circ\text{C}$	3
		$T_A=70^\circ\text{C}$	1.9
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ^a	42	$^\circ\text{C/W}$
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ELECTRICAL CHARACTERISTICS (TA=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	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V			1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±12V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.5	0.9	1.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =3.5A		26	33	m ohm
		V _{GS} =4.5V, I _D =3.1A		31	42	m ohm
		V _{GS} =2.5V, I _D =2.6A		42	57	m ohm
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =3.5A		16		S
DYNAMIC CHARACTERISTICS ^c						
C _{ISS}	Input Capacitance	V _{DS} =15V, V _{GS} =0V f=1.0MHz		390		pF
C _{OSS}	Output Capacitance			69		pF
C _{RSS}	Reverse Transfer Capacitance			56		pF
SWITCHING CHARACTERISTICS ^c						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =15V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		6.6		ns
t _r	Rise Time			11		ns
t _{D(OFF)}	Turn-Off Delay Time			18		ns
t _f	Fall Time			16		ns
Q _g	Total Gate Charge	V _{DS} =15V, I _D =3.5A, V _{GS} =10V		9.8		nC
		V _{DS} =15V, I _D =3.5A, V _{GS} =4.5V		5		nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V, I _D =3.5A,		0.7		nC
Q _{gd}	Gate-Drain Charge	V _{GS} =10V		2		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A		0.77	1.2	V

Notes

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

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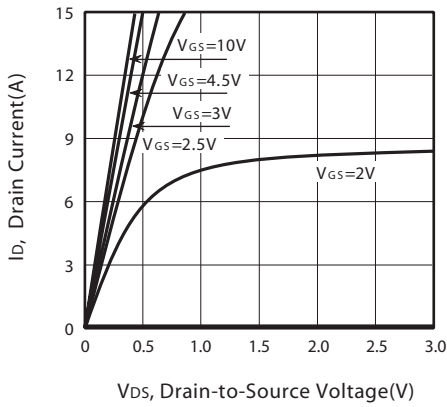


Figure 1. Output Characteristics

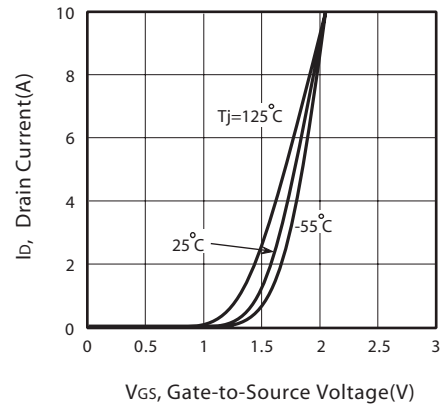


Figure 2. Transfer Characteristics

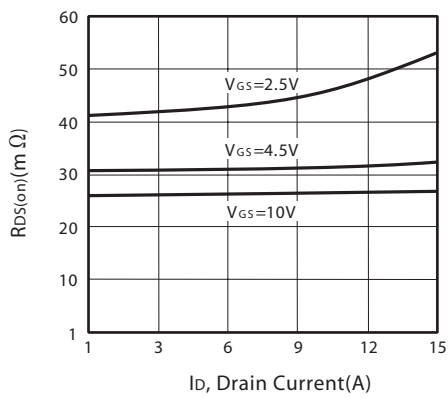


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

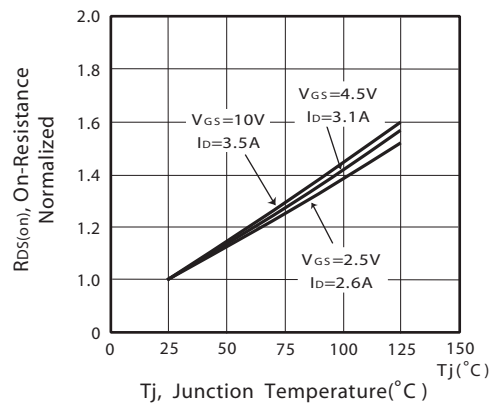


Figure 4. On-Resistance Variation with Drain Current and Temperature

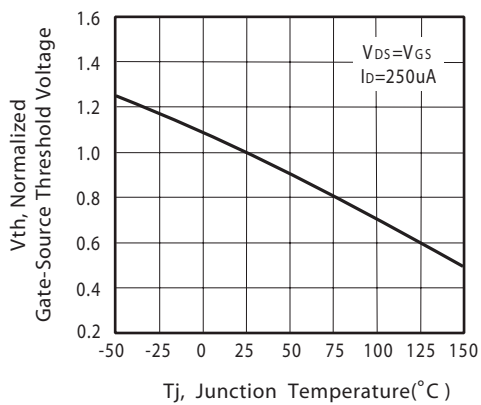


Figure 5. Gate Threshold Variation with Temperature

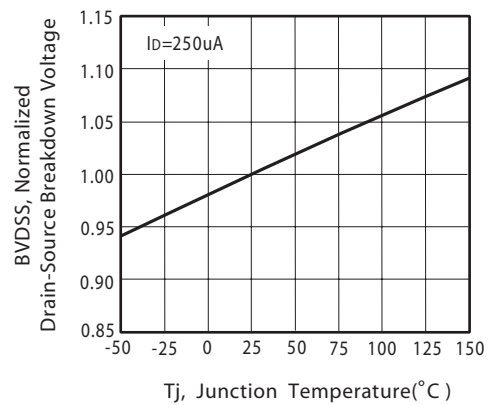


Figure 6. Breakdown Voltage Variation with Temperature

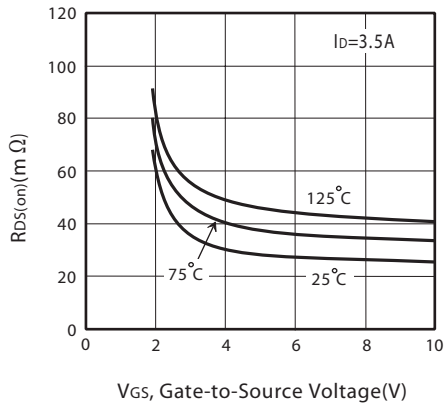


Figure 7. On-Resistance vs. Gate-Source Voltage

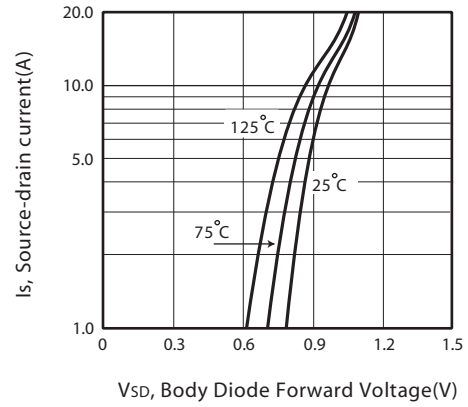


Figure 8. Body Diode Forward Voltage Variation with Source Current

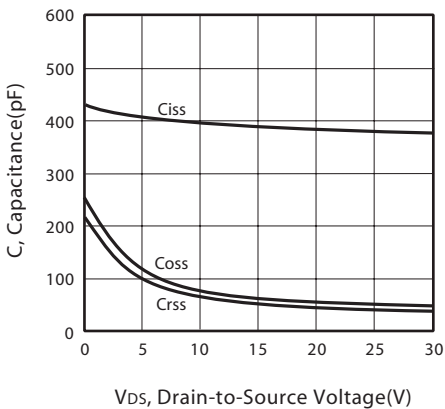


Figure 9. Capacitance

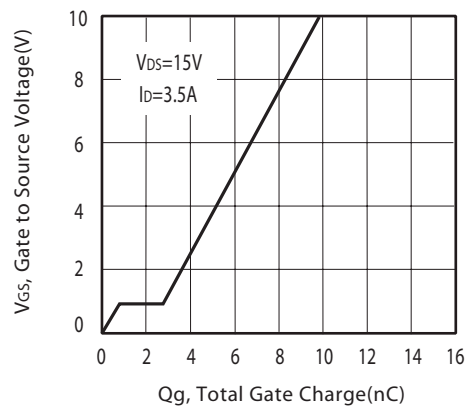


Figure 10. Gate Charge

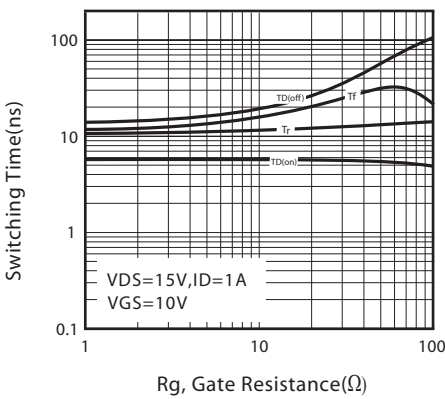


Figure 11. switching characteristics

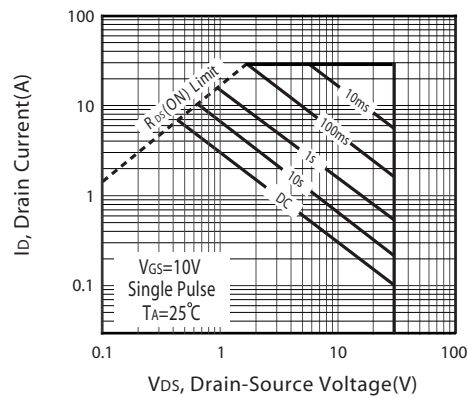
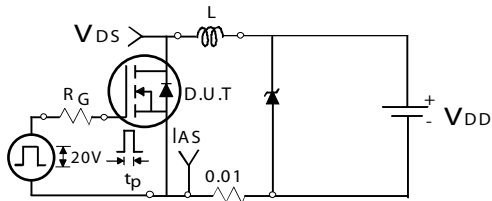
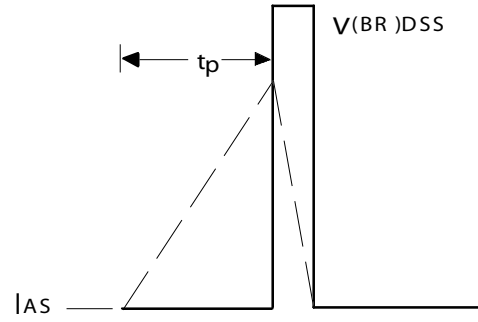


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

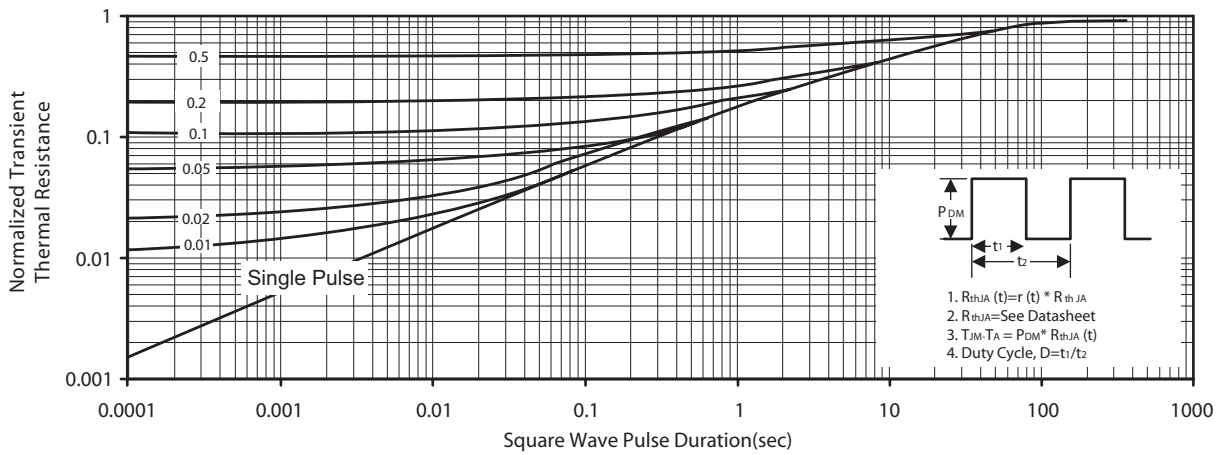
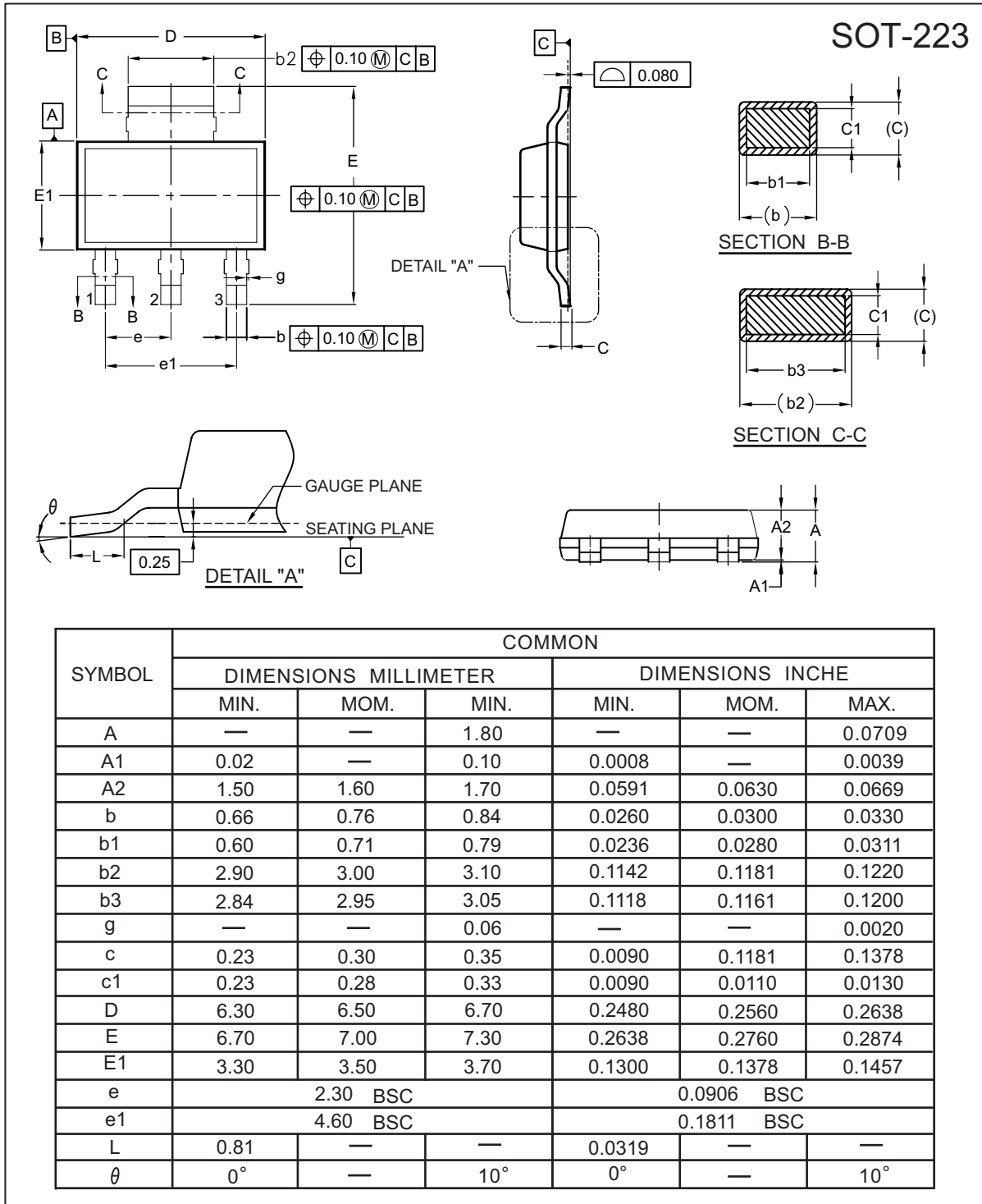


Figure 14. Normalized Thermal Transient Impedance Curve

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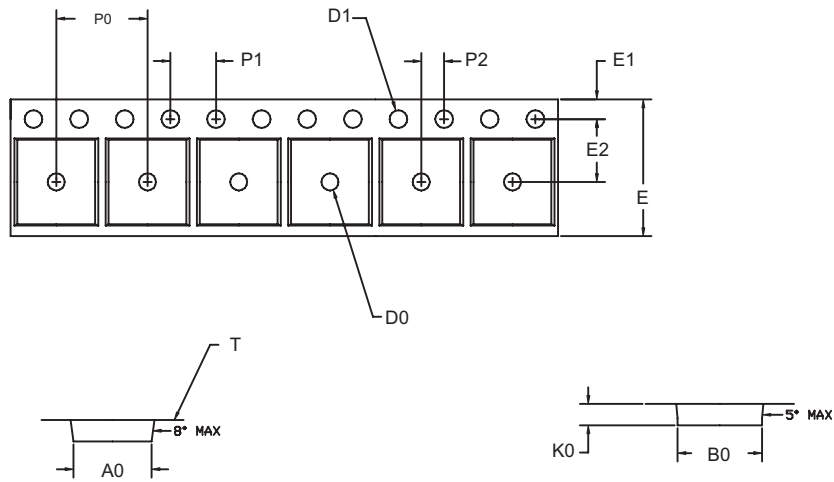
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SOT-223 Tape and Reel Data

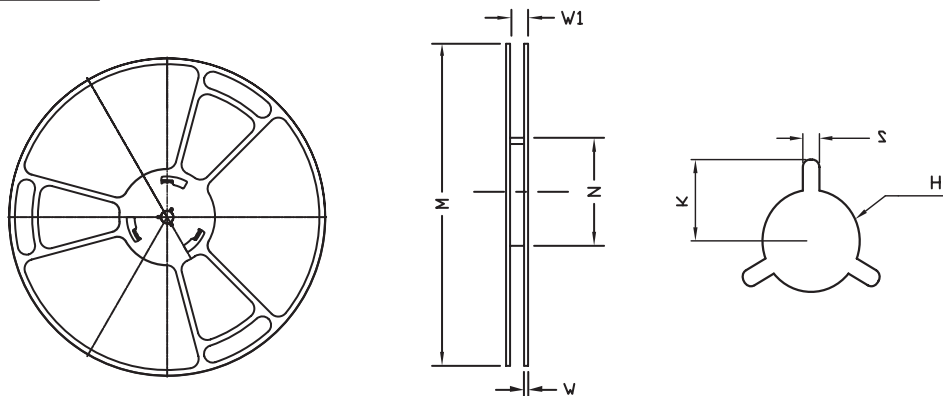
SOT-223 Carrier Tape



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	---	---	---