



N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

VDSS	ID	RDS(ON) (mΩ) Max
60V	4.2A	76 @ VGS=10V
		100 @ VGS=4.5V

FEATURES

- Super high dense cell design for low RDS(ON).
- Rugged and reliable.
- Surface Mount Package.



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

Symbol	Parameter	Limit	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current-Continuous ^a	T _A =25°C	4.2
		T _A =70°C	3.4
I _{DM}	-Pulsed ^b	28	A
E _{AS}	Single Pulse Avalanche Energy ^d	16	mJ
P _D	Maximum Power Dissipation ^a	T _A =25°C	3
		T _A =70°C	1.9
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJA}	Thermal Resistance, Junction-to-Ambient ^a	42	°C/W
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ELECTRICAL CHARACTERISTICS (T_A=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	60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V , 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 =4.2A		61	76	m ohm
		V _{GS} =4.5V , I _D =3.7A		74	100	m ohm
g _{FS}	Forward Transconductance	V _{DS} =5V , I _D =4.2A		10.5		S
DYNAMIC CHARACTERISTICS ^c						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V f=1.0MHz		720		pF
C _{OSS}	Output Capacitance			52		pF
C _{RSS}	Reverse Transfer Capacitance			39		pF
SWITCHING CHARACTERISTICS ^c						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =30V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		12.5		ns
t _r	Rise Time			12		ns
t _{D(OFF)}	Turn-Off Delay Time			20		ns
t _f	Fall Time			14.5		ns
Q _g	Total Gate Charge	V _{DS} =30V, I _D =4.2A, V _{GS} =10V		12		nC
		V _{DS} =30V, I _D =4.2A, V _{GS} =4.5V		6		nC
Q _{gs}	Gate-Source Charge	V _{DS} =30V, I _D =4.2A,		1.5		nC
Q _{gd}	Gate-Drain Charge	V _{GS} =10V		3.2		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage ^b	V _{GS} =0V, I _S =1A		0.79	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} = 30V. (See Figure13)

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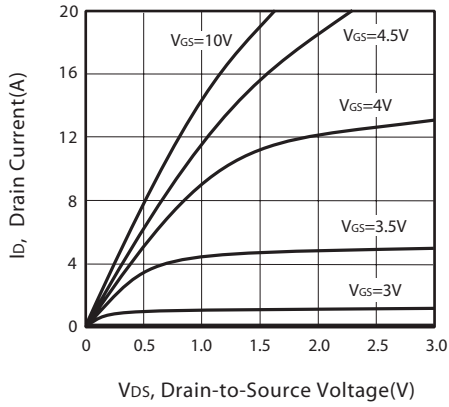


Figure 1. Output Characteristics

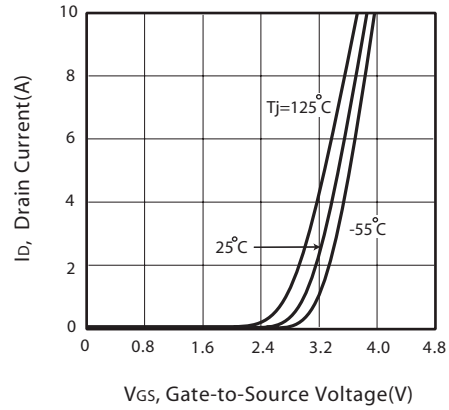


Figure 2. Transfer Characteristics

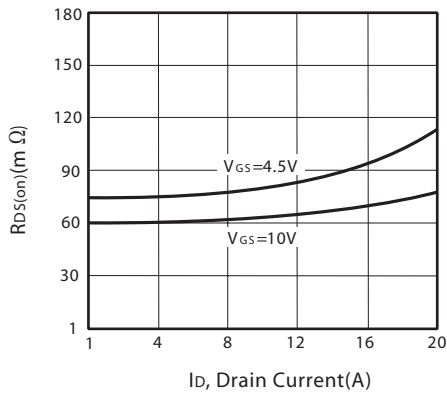


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

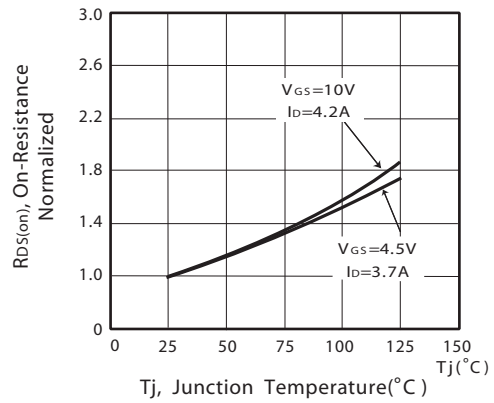


Figure 4. On-Resistance Variation with Drain Current and Temperature

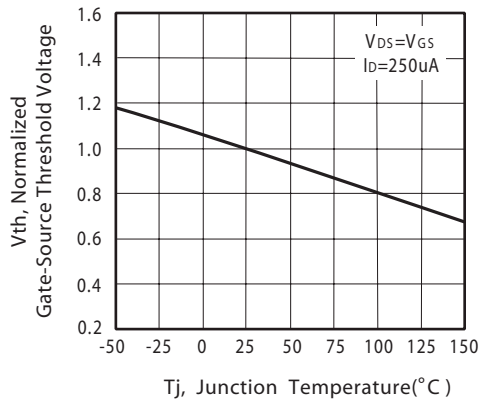


Figure 5. Gate Threshold Variation with Temperature

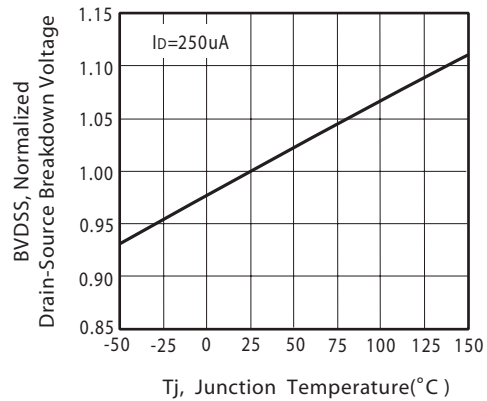


Figure 6. Breakdown Voltage Variation with Temperature

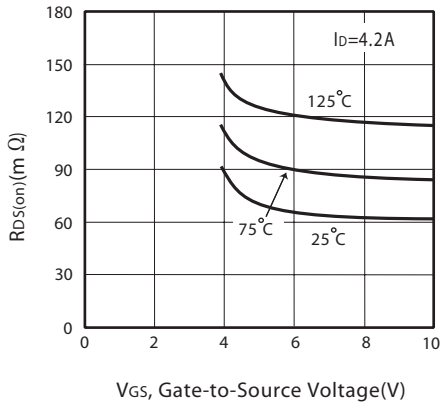


Figure 7. On-Resistance vs. Gate-Source Voltage

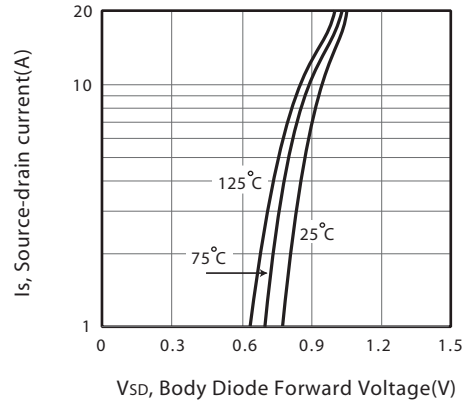


Figure 8. Body Diode Forward Voltage Variation with Source Current

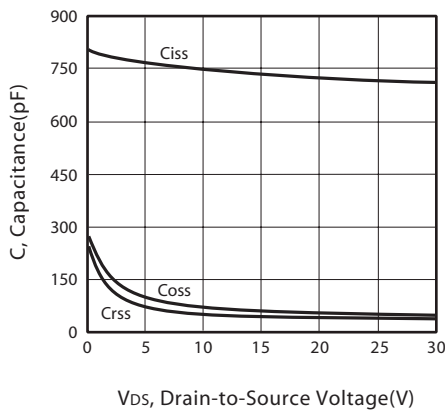


Figure 9. Capacitance

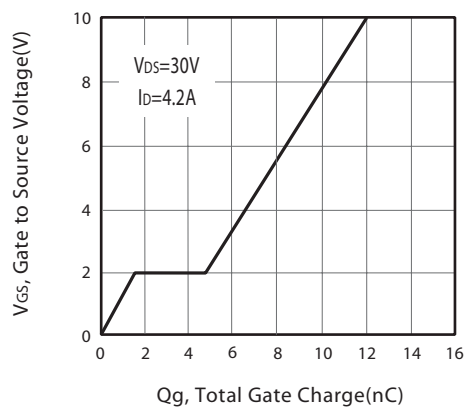


Figure 10. Gate Charge

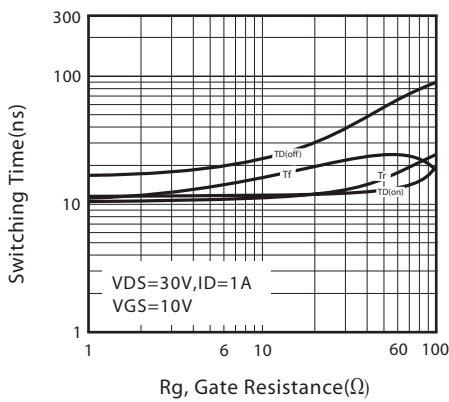


Figure 11. switching characteristics

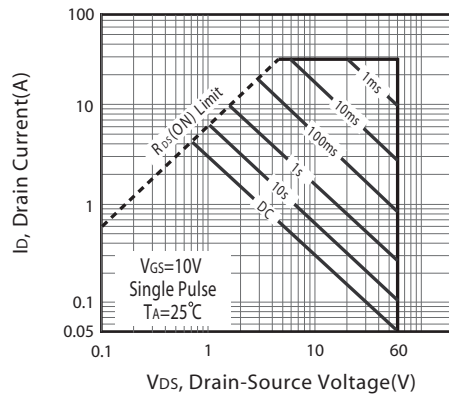
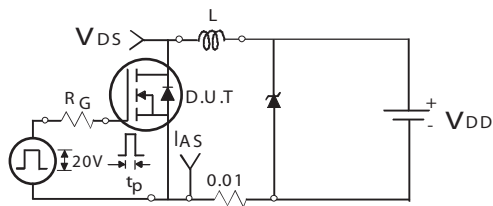
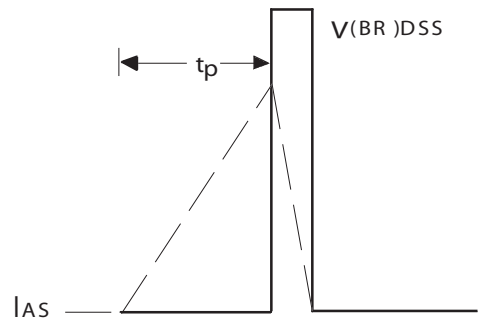


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

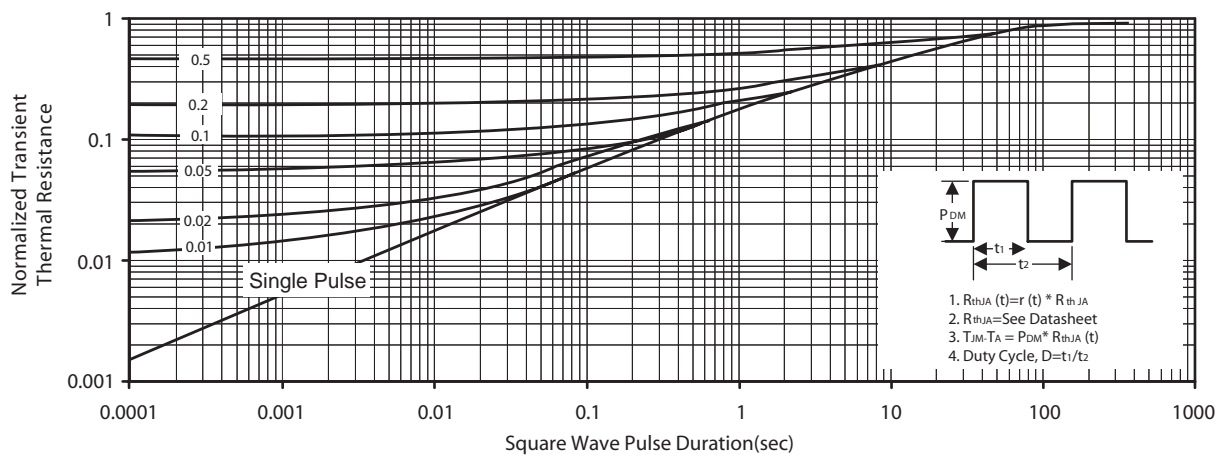
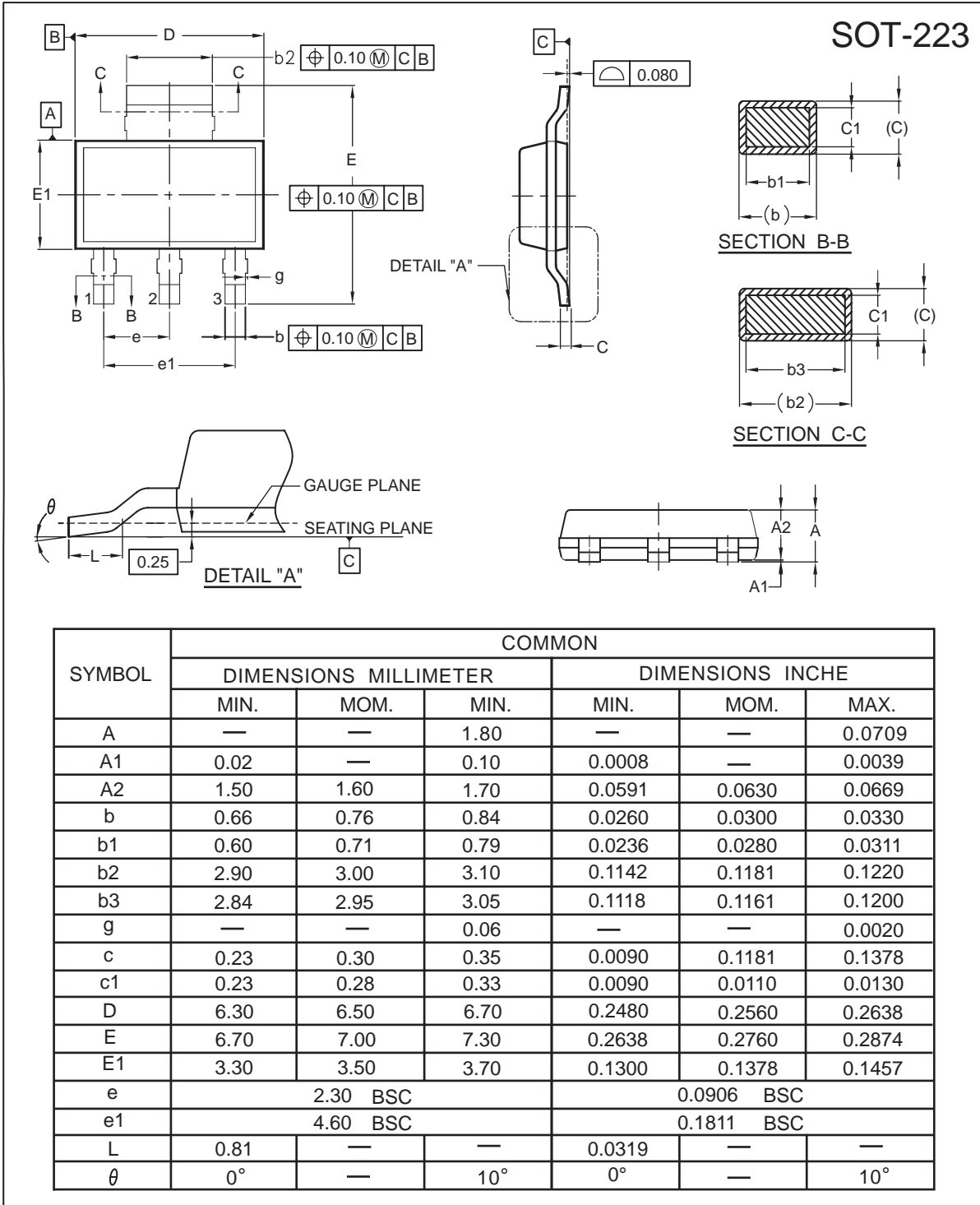


Figure 14. Normalized Thermal Transient Impedance Curve

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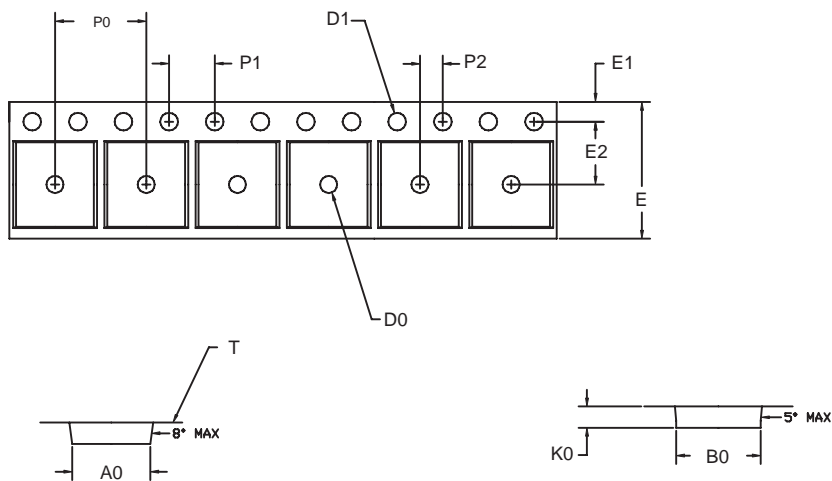
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SOT-223 Tape and Reel Data

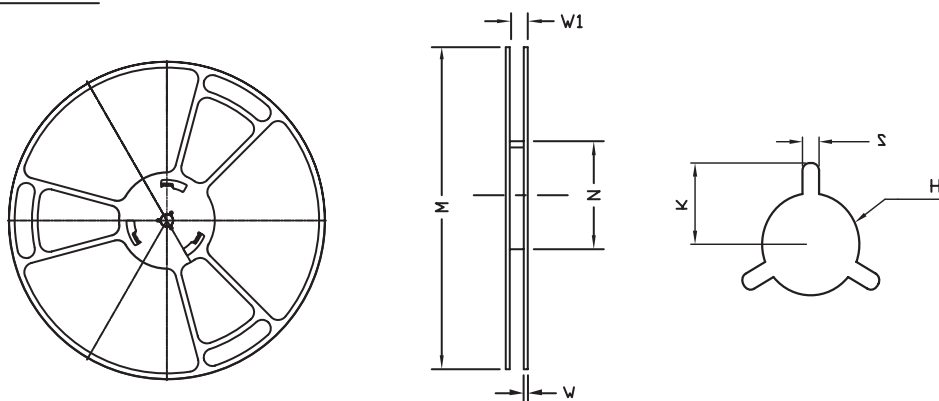
SOT-223 Carrier Tape



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	---	---	---