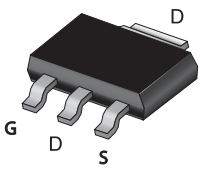
N-Channel Logic Level Enhancement Mode Field Effect Transistor

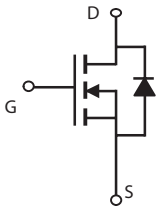
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (mΩ) Max
60V	8A	27 @ VGS=10V

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°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 e]	T_C=25°C	8	A
		T_C=70°C	6.4	A
I_{DM}	-Pulsed [b]		53	A
E_{AS}	Single Pulse Avalanche Energy [d]		72	mJ
P_D	Maximum Power Dissipation [a]	T_C=25°C	3	W
		T_C=70°C	1.9	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient [a]	42	°C/W

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	2	2.6	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=4A		21	27	m ohm
g_{FS}	Forward Transconductance	V_{DS}=10V , I_D=4A		11		S
DYNAMIC CHARACTERISTICS [c]						
C_{ISS}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHz		2300		pF
C_{OSS}	Output Capacitance			143		pF
C_{RSS}	Reverse Transfer Capacitance			105		pF
SWITCHING CHARACTERISTICS [c]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=30V I_D=1A V_{GS}=10V R_{GEN}= 6 ohm		50		ns
t_r	Rise Time			30		ns
$t_{D(OFF)}$	Turn-Off Delay Time			61		ns
t_f	Fall Time			12		ns
Q_g	Total Gate Charge	V_{DS}=30V,I_D=4A,V_{GS}=10V		25		nC
Q_{gs}	Gate-Source Charge	V_{DS}=30V,I_D=4A, V_{GS}=10V		4		nC
Q_{gd}	Gate-Drain Charge			7		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=4A		0.81	1.2	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} = 30V.(See Figure13)
e.Drain current limited by maximum junction temperature.

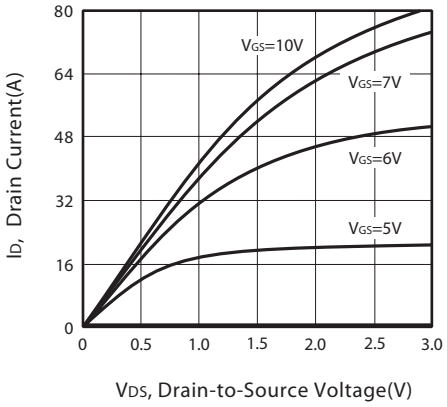


Figure 1. Output Characteristics

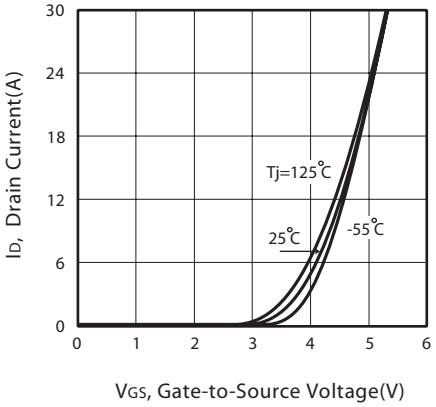


Figure 2. Transfer Characteristics

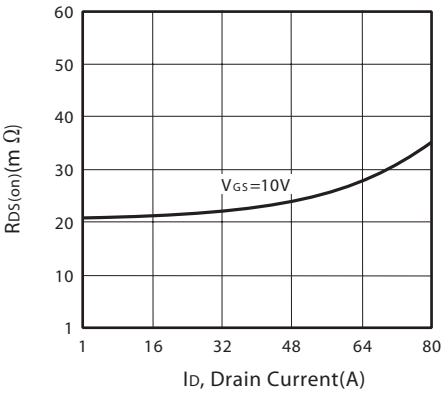


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

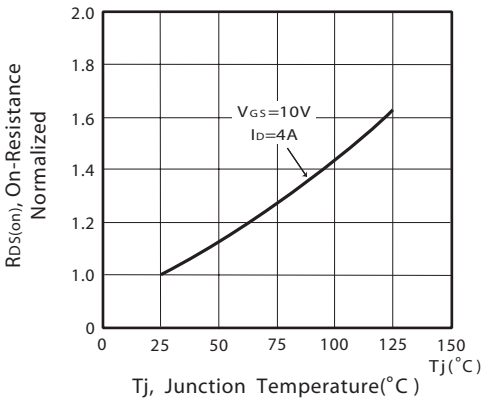


Figure 4. On-Resistance Variation with Drain Current and Temperature

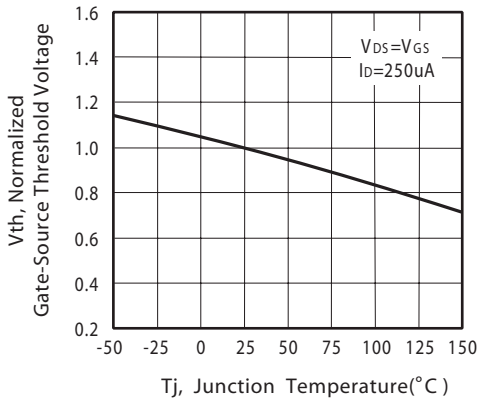


Figure 5. Gate Threshold Variation with Temperature

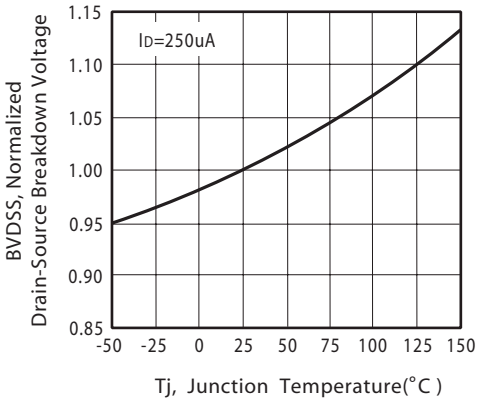


Figure 6. Breakdown Voltage Variation with Temperature

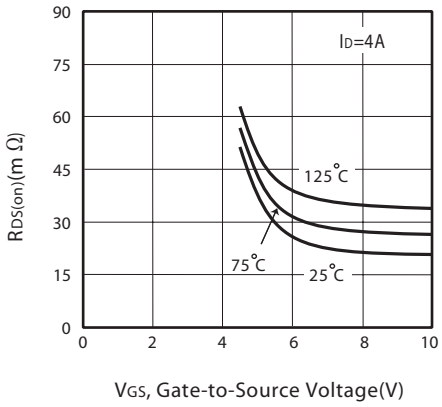


Figure 7. On-Resistance vs. Gate-Source Voltage

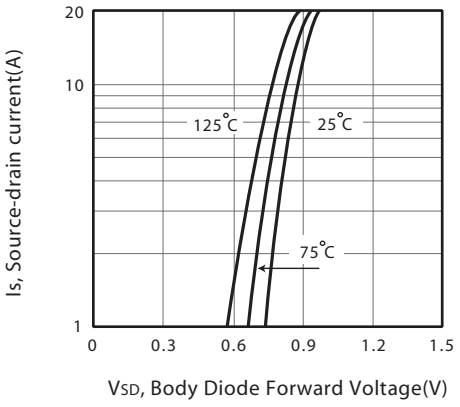


Figure 8. Body Diode Forward Voltage Variation with Source Current

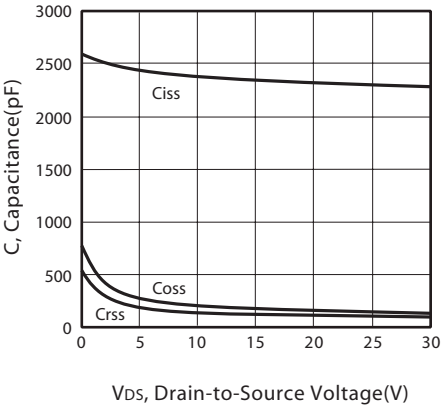


Figure 9. Capacitance

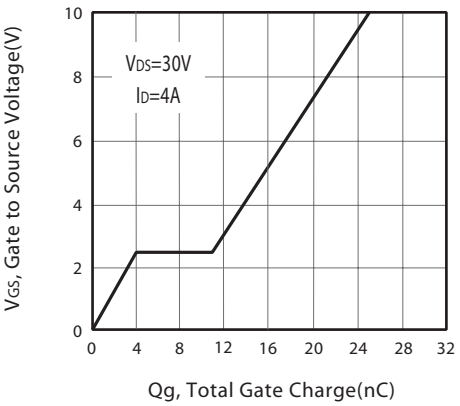


Figure 10. Gate Charge

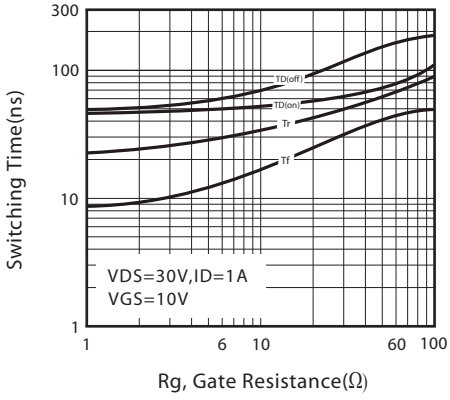


Figure 11. switching characteristics

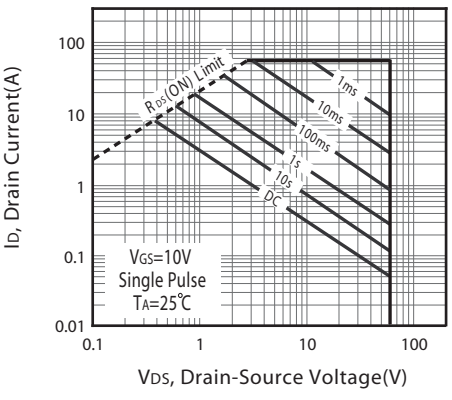
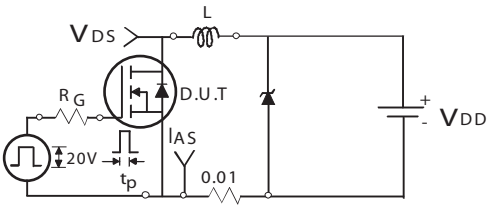
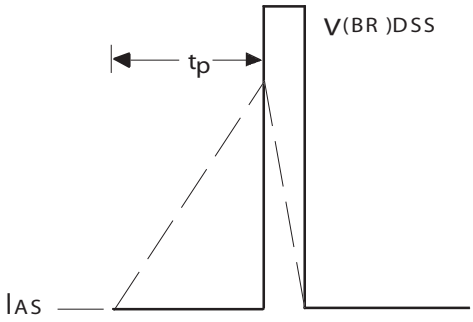


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

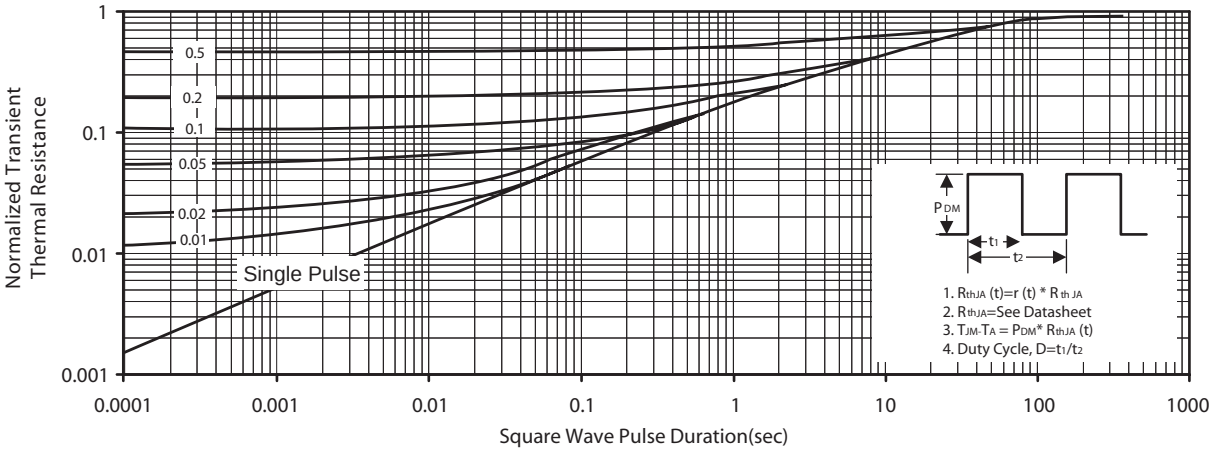


Figure 14. Normalized Thermal Transient Impedance Curve

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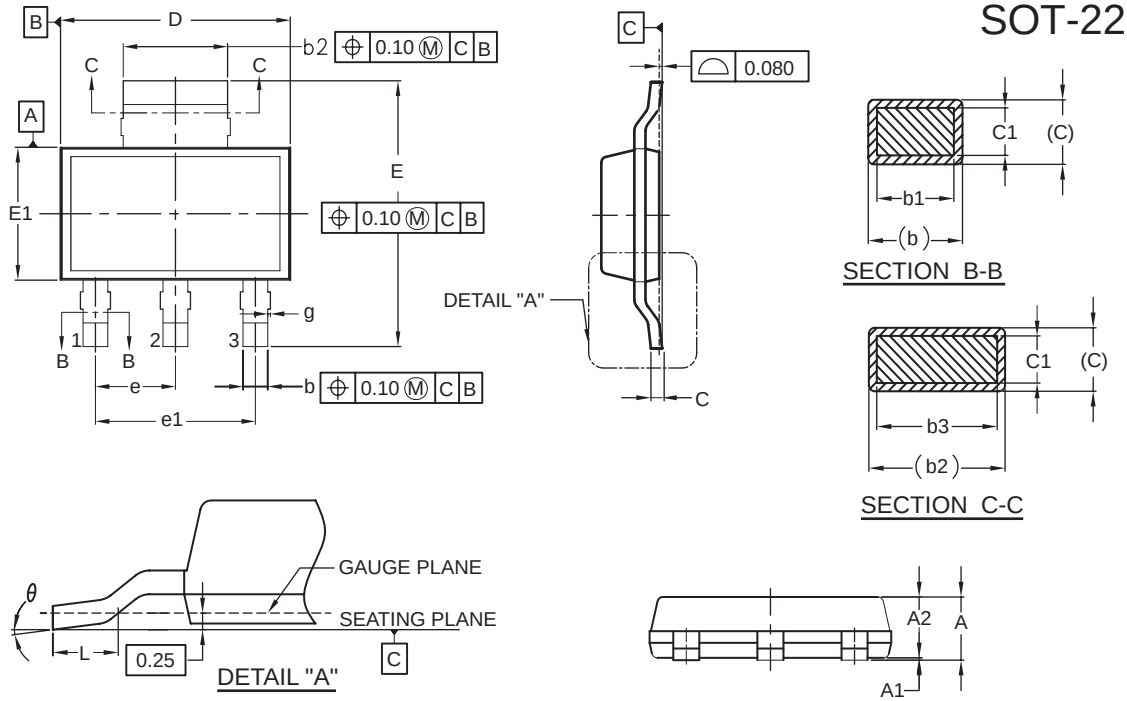
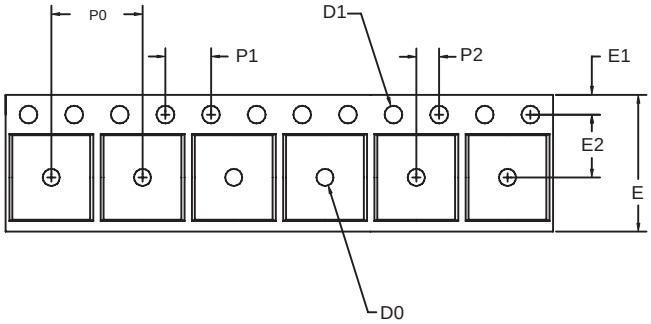
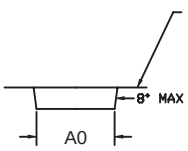


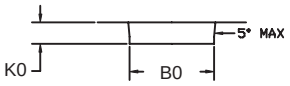
SYMBOL	COMMON					
	DIMENSIONS MILLIMETER			DIMENSIONS INCHE		
	MIN.	MOM.	MIN.	MIN.	MOM.	MAX.
A	—	—	1.80	—	—	0.0709
A1	0.02	—	0.10	0.0008	—	0.0039
A2	1.50	1.60	1.70	0.0591	0.0630	0.0669
b	0.66	0.76	0.84	0.0260	0.0300	0.0330
b1	0.60	0.71	0.79	0.0236	0.0280	0.0311
b2	2.90	3.00	3.10	0.1142	0.1181	0.1220
b3	2.84	2.95	3.05	0.1118	0.1161	0.1200
g	—	—	0.06	—	—	0.0020
c	0.23	0.30	0.35	0.0090	0.1181	0.1378
c1	0.23	0.28	0.33	0.0090	0.0110	0.0130
D	6.30	6.50	6.70	0.2480	0.2560	0.2638
E	6.70	7.00	7.30	0.2638	0.2760	0.2874
E1	3.30	3.50	3.70	0.1300	0.1378	0.1457
e	2.30 BSC			0.0906 BSC		
e1	4.60 BSC			0.1811 BSC		
L	0.81	—	—	0.0319	—	—
θ	0°	—	10°	0°	—	10°

SOT-223 Tape and Reel Data

SOT-223 Carrier Tape



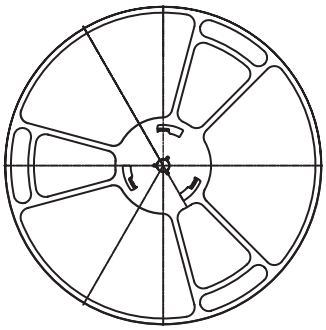


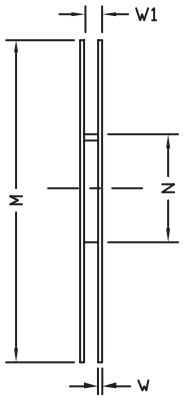


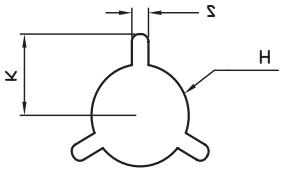
unit:㎜

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:㎜

REEL SIZE	M	N	W	W1	H	K	S	G	R	V
ϕ330 ± 0.5	———	ϕ97.0 ± 1.0	2.2	13.0 + 1.5	ϕ13.0 + 0.5 - 0.2	10.6	2.0 ±0.5	———	———	———

TOP MARKING DEFINITION

SOT-223