

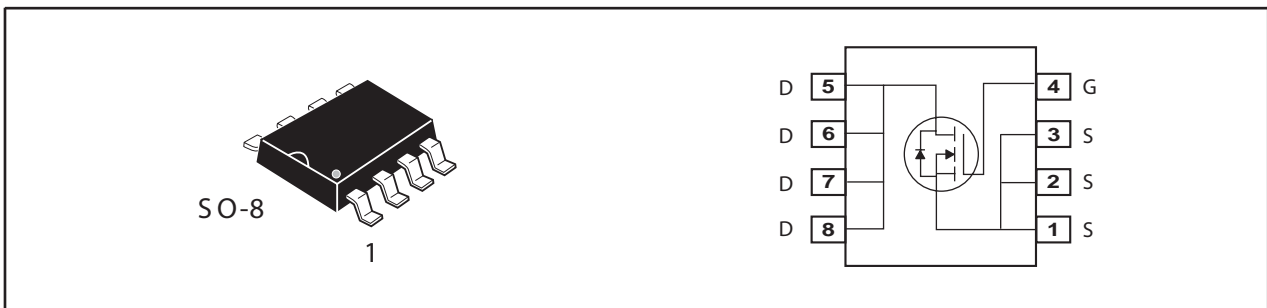


N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
60V	7A	25 @ V _{GS} =10V
		34 @ V _{GS} =4.5V

FEATURES

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



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	T _A =25°C	7
		T _A =70°C	5.6
I _{DM}	-Pulsed ^b	35	A
E _{AS}	Single Pulse Avalanche Energy ^d	90	mJ
P _D	Maximum Power Dissipation ^a	T _A =25°C	2.5
		T _A =70°C	1.6
T _J , T _{STG}	Operating Junction and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJA}	Thermal Resistance, Junction-to-Ambient ^a	50	°C/W
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STM6970

Ver 1.0

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	2	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =3.5A		20	25	m ohm
		V _{GS} =4.5V , I _D =3A		25	34	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =3.5A		14		S
DYNAMIC CHARACTERISTICS ^c						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V f=1.0MHz		1665		pF
C _{OSS}	Output Capacitance			135		pF
C _{RSS}	Reverse Transfer Capacitance			110		pF
SWITCHING CHARACTERISTICS ^c						
t _{D(ON)}	Turn-On Delay Time	V _{DD} =30V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		30		ns
t _r	Rise Time			29		ns
t _{D(OFF)}	Turn-Off Delay Time			68		ns
t _f	Fall Time			16		ns
Q _g	Total Gate Charge	V _{DS} =30V, I _D =3.5A, V _{GS} =10V		26		nC
		V _{DS} =30V, I _D =3.5A, V _{GS} =4.5V		13		nC
Q _{gs}	Gate-Source Charge	V _{DS} =30V, I _D =3.5A,		2.7		nC
Q _{gd}	Gate-Drain Charge	V _{GS} =10V		7.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =4A		0.8	1.3	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)

Jan,28,2013

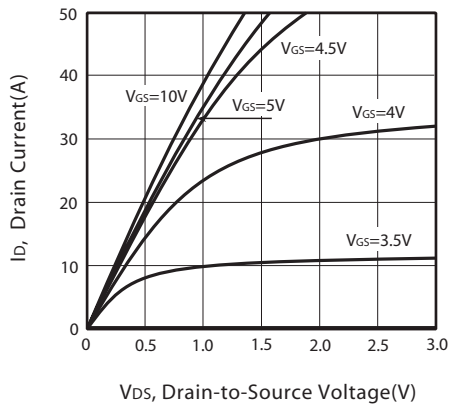


Figure 1. Output Characteristics

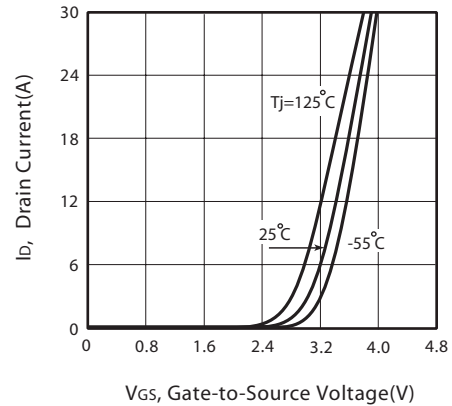


Figure 2. Transfer Characteristics

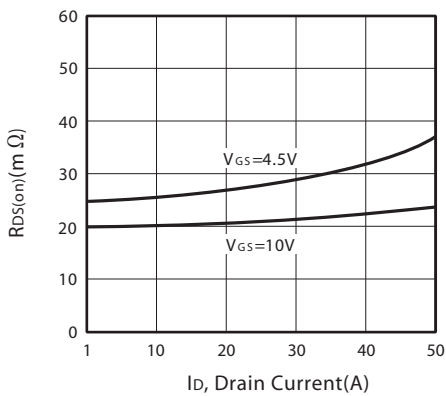


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

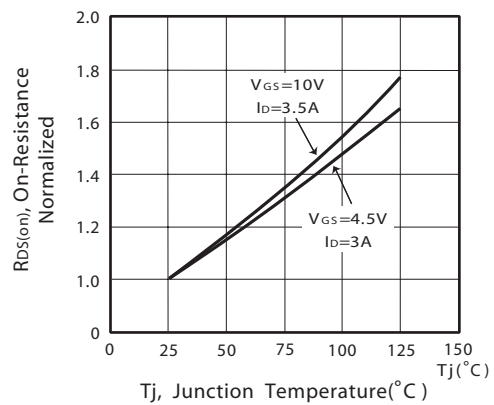


Figure 4. On-Resistance Variation with Drain Current and Temperature

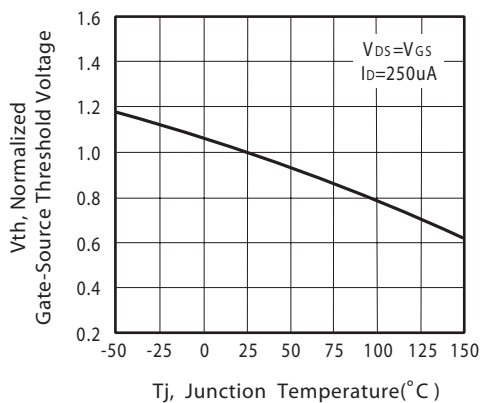


Figure 5. Gate Threshold Variation with Temperature

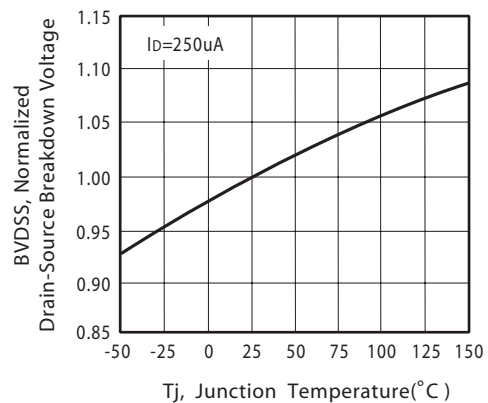


Figure 6. Breakdown Voltage Variation with Temperature

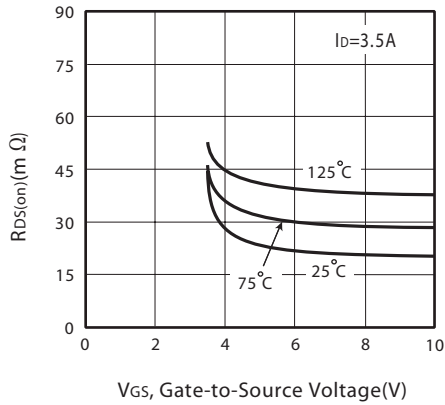


Figure 7. On-Resistance vs. Gate-Source Voltage

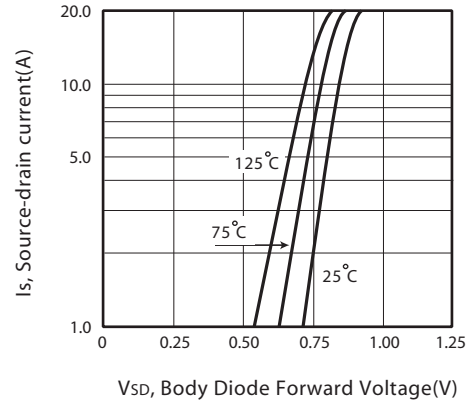


Figure 8. Body Diode Forward Voltage Variation with Source Current

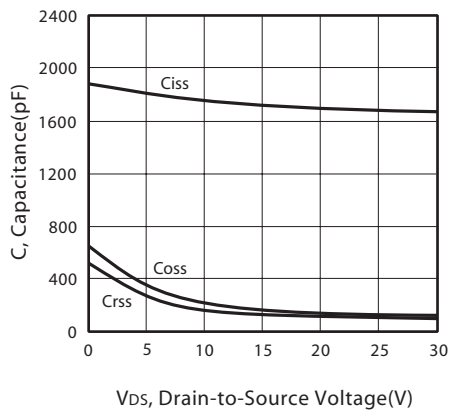


Figure 9. Capacitance

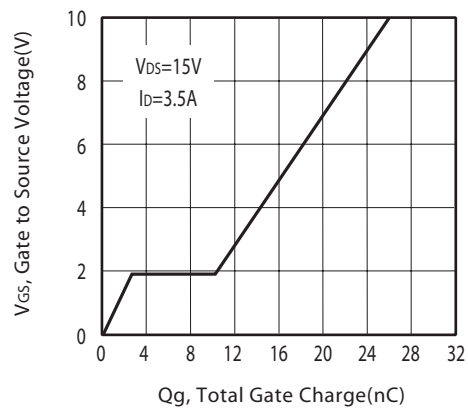


Figure 10. Gate Charge

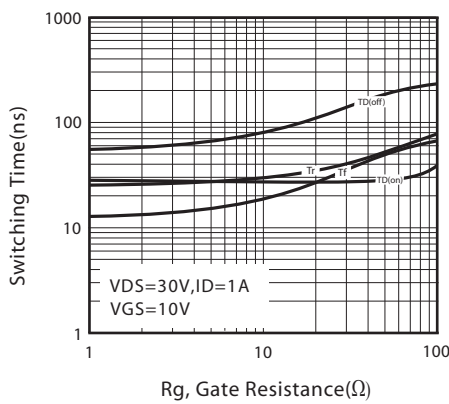


Figure 11. switching characteristics

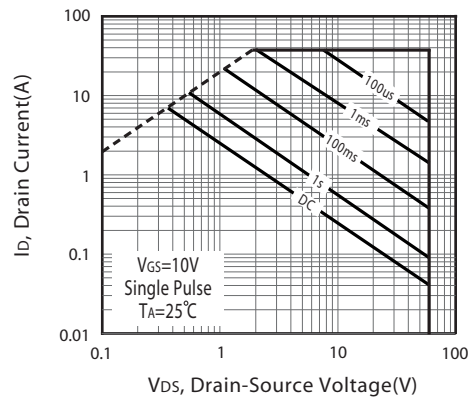
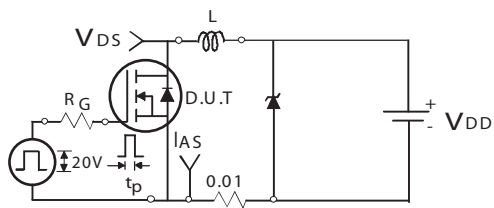
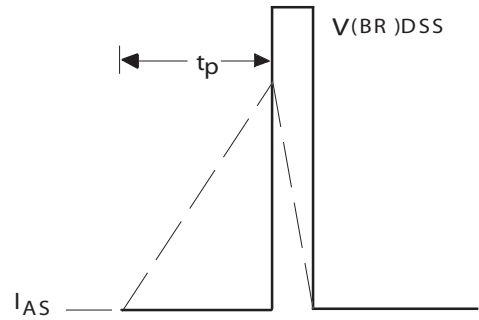


Figure 12. Maximum Safe Operating Area



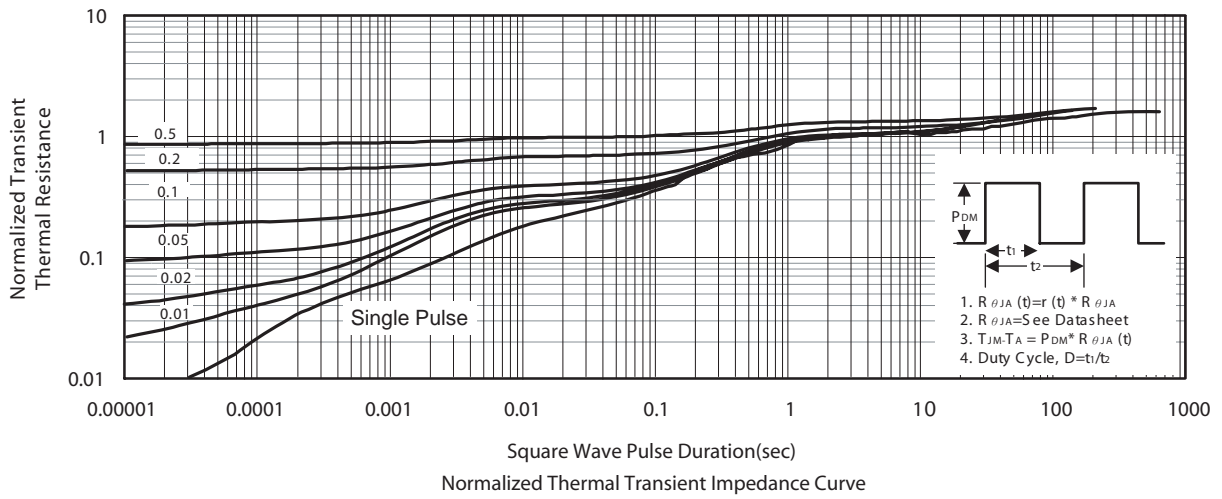
Unclamped Inductive Test Circuit

Figure 13a.



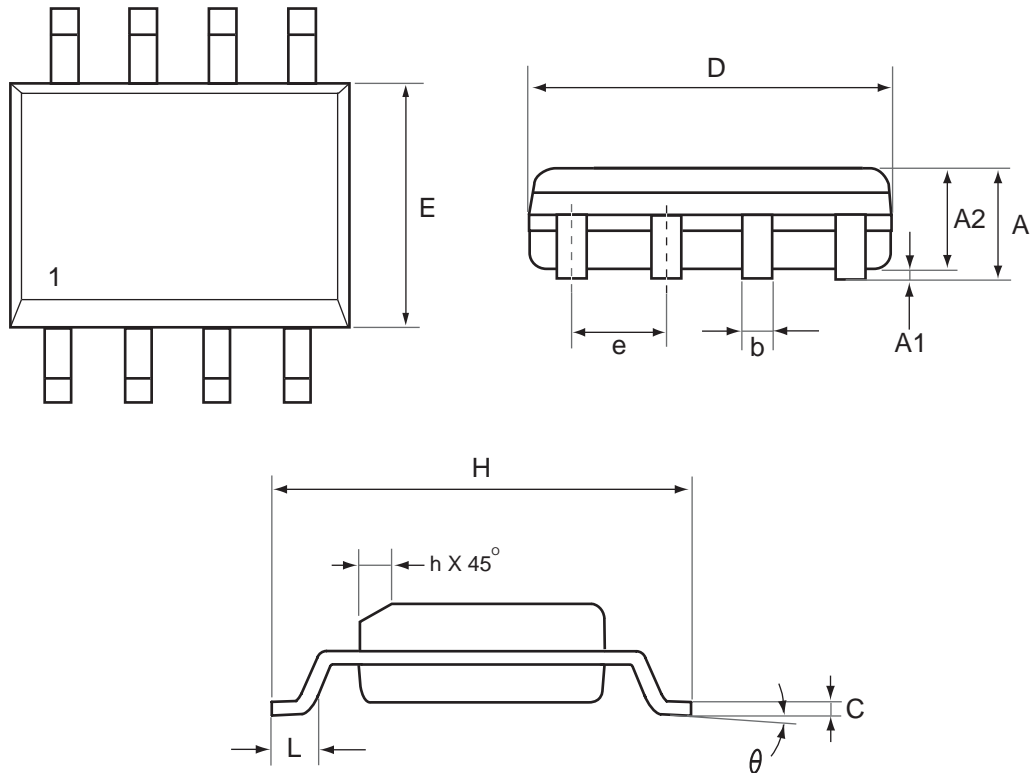
Unclamped Inductive Waveforms

Figure 13b.



PACKAGE OUTLINE DIMENSIONS

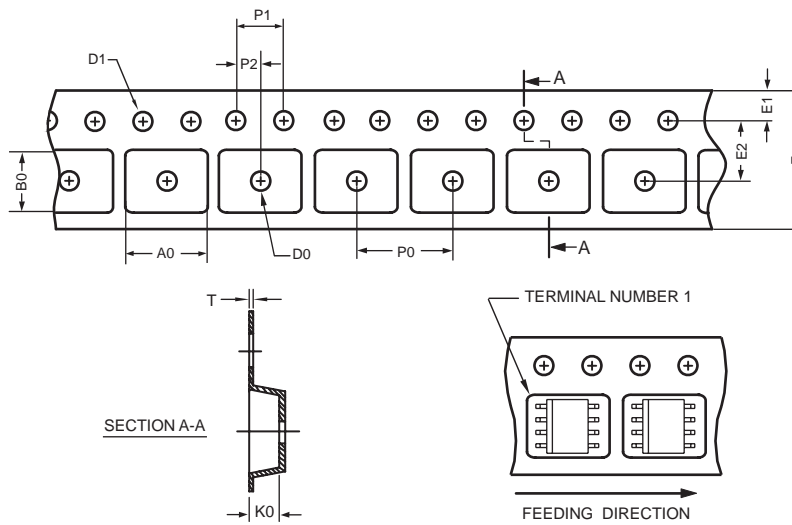
SO-8



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	1.63	0.049	0.064
b	0.31	0.51	0.012	0.020
C	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	3.70	4.00	0.146	0.157
e	1.27 REF.		0.050 BSC	
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°
h	0.25	0.50	0.010	0.020

SO-8 Tape and Reel Data

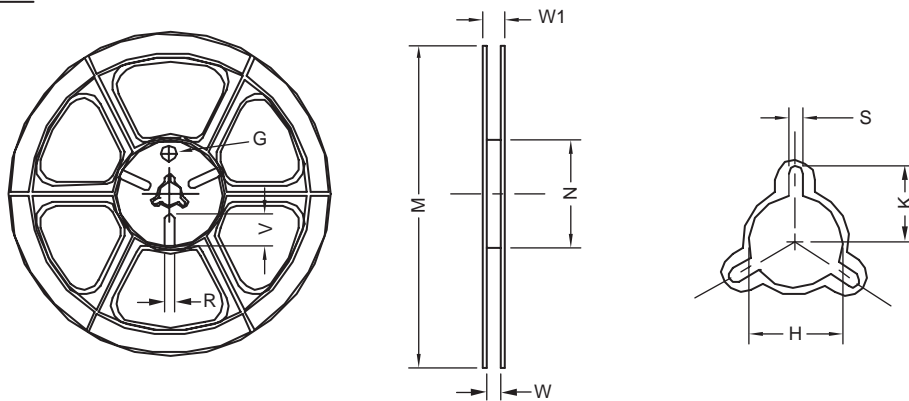
SO-8 Carrier Tape



unit: mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.50 ±0.15	5.25 ±0.10	2.10 ±0.10	φ 1.5 (MIN)	φ 1.55 ±0.10	12.0 +0.3 -0.1	1.75 ±0.10	5.5 ±0.10	8.0 ±0.10	4.0 ±0.10	2.0 ±0.10	0.30 ±0.013

SO-8 Reel



UNIT: mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	φ 330	330 ± 1	62 ±1.5	12.4 + 0.2	16.8 - 0.4	φ 12.75 + 0.15	---	2.0 ±0.15	---	---	---