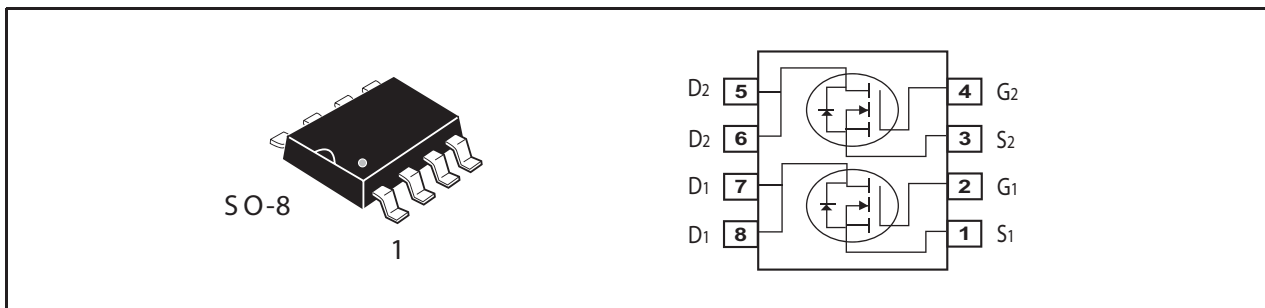


**Dual N-Channel Enhancement Mode Field Effect Transistor****PRODUCT SUMMARY**

V <sub>DSS</sub>	I <sub>D</sub>	R <sub>DS(ON)</sub> (mΩ) Max
60V	5.5A	55 @ V <sub>GS</sub> =10V
		70 @ 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	60	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Drain Current-Continuous <sup>a</sup>	T <sub>A</sub> =25°C	5.5
		T <sub>A</sub> =70°C	4.5
I <sub>DM</sub>	-Pulsed <sup>b</sup>	25	A
P <sub>D</sub>	Maximum Power Dissipation <sup>a</sup>	T <sub>A</sub> =25°C	2
		T <sub>A</sub> =70°C	1.28
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 <sup>a</sup>	62.5	°C/W
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# STM6960

Ver 1.2

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>OFF CHARACTERISTICS</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250μA	60			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =48V , V <sub>GS</sub> =0V			1	μA
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>GS</sub> = ±20V , V <sub>DS</sub> =0V			±100	nA
<b>ON CHARACTERISTICS</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.8	3	V
R <sub>DS(ON)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =4.5A		47	55	m ohm
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =3A		55	70	m ohm
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =5V , I <sub>D</sub> =4.5A		12		S
<b>DYNAMIC CHARACTERISTICS <sup>c</sup></b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V f=1.0MHz		1100		pF
C <sub>OSS</sub>	Output Capacitance			75		pF
C <sub>RSS</sub>	Reverse Transfer Capacitance			55		pF
<b>SWITCHING CHARACTERISTICS <sup>c</sup></b>						
t <sub>D(ON)</sub>	Turn-On DelayTime	V <sub>DD</sub> =30V I <sub>D</sub> =4.5A V <sub>GS</sub> =10V R <sub>GEN</sub> =3 ohm		18		ns
t <sub>r</sub>	Rise Time			14		ns
t <sub>D(OFF)</sub>	Turn-Off DelayTime			40		ns
t <sub>f</sub>	Fall Time			8		ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =48V, I <sub>D</sub> =4.5A, V <sub>GS</sub> =10V		18		nC
		V <sub>DS</sub> =48V, I <sub>D</sub> =4.5A, V <sub>GS</sub> =4.5V		9		nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =48V, I <sub>D</sub> =4.5A, V <sub>GS</sub> =10V		2.3		nC
Q <sub>gd</sub>	Gate-Drain Charge			4.9		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1.7A		0.8	1.2	V
<b>Notes</b> 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.						

Apr,27,2010

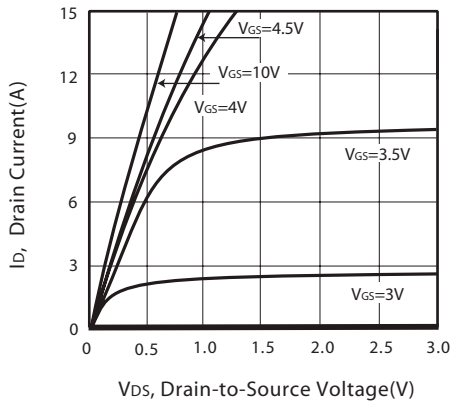


Figure 1. Output Characteristics

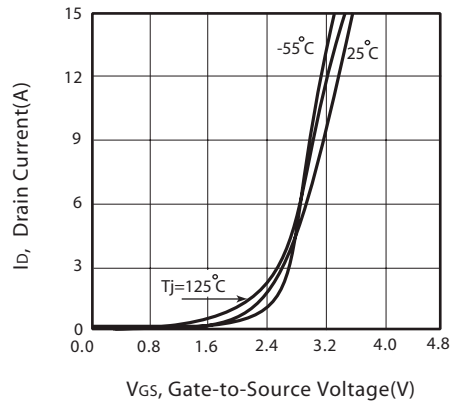


Figure 2. Transfer Characteristics

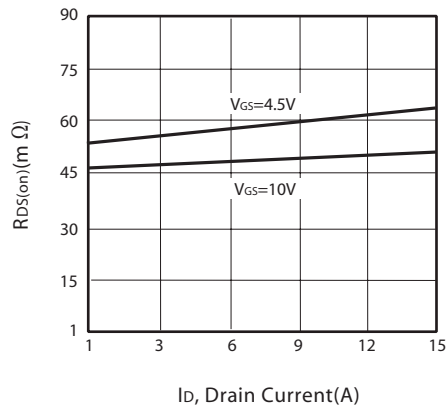


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

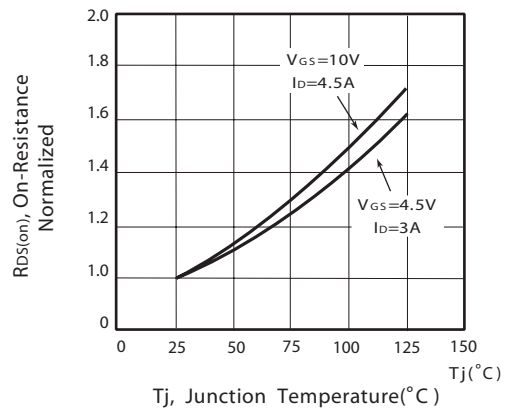


Figure 4. On-Resistance Variation with Drain Current and Temperature

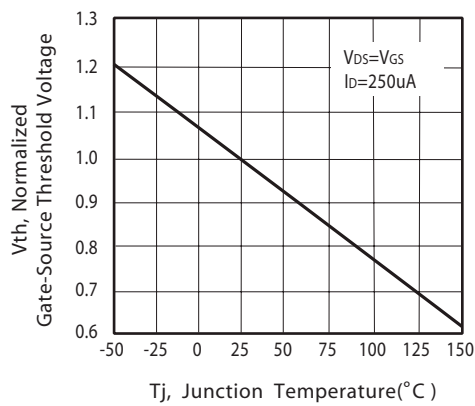


Figure 5. Gate Threshold Variation with Temperature

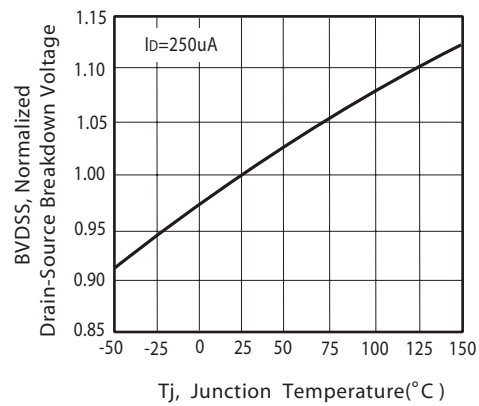


Figure 6. Breakdown Voltage Variation with Temperature

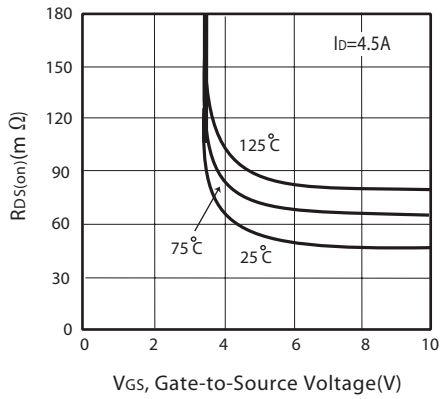


Figure 7. On-Resistance vs. Gate-Source Voltage

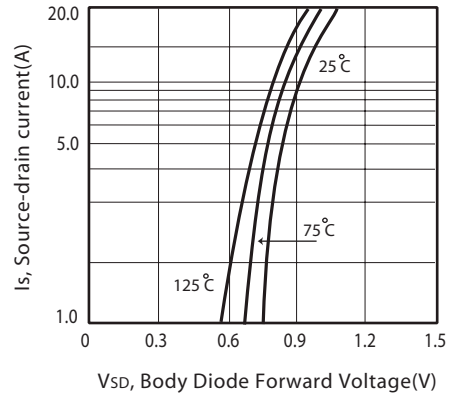


Figure 8. Body Diode Forward Voltage Variation with Source Current

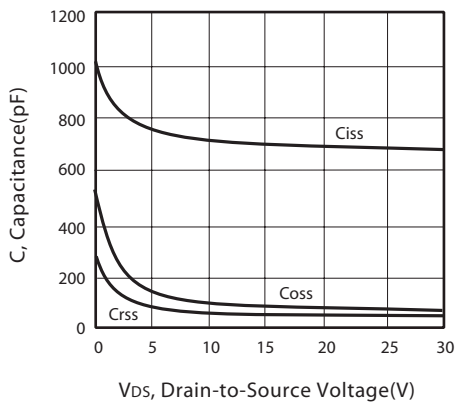


Figure 9. Capacitance

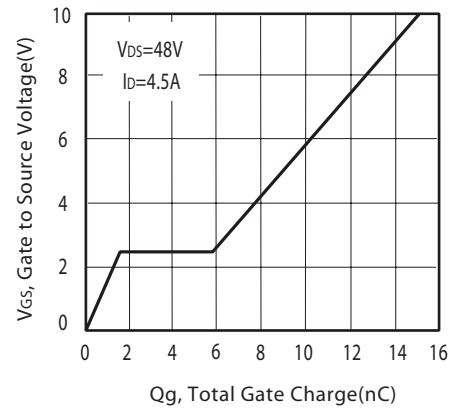


Figure 10. Gate Charge

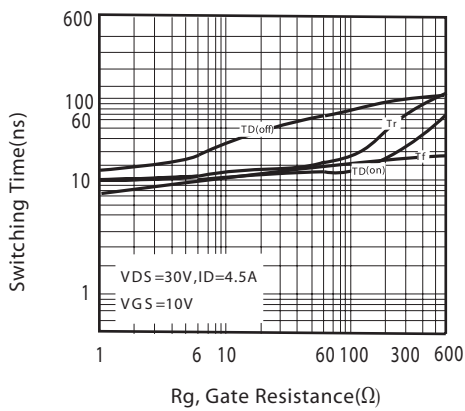


Figure 11. switching characteristics

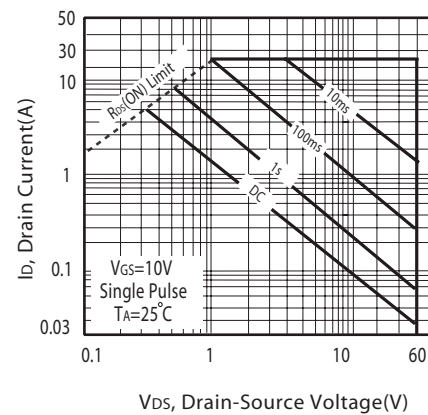


Figure 12. Maximum Safe Operating Area

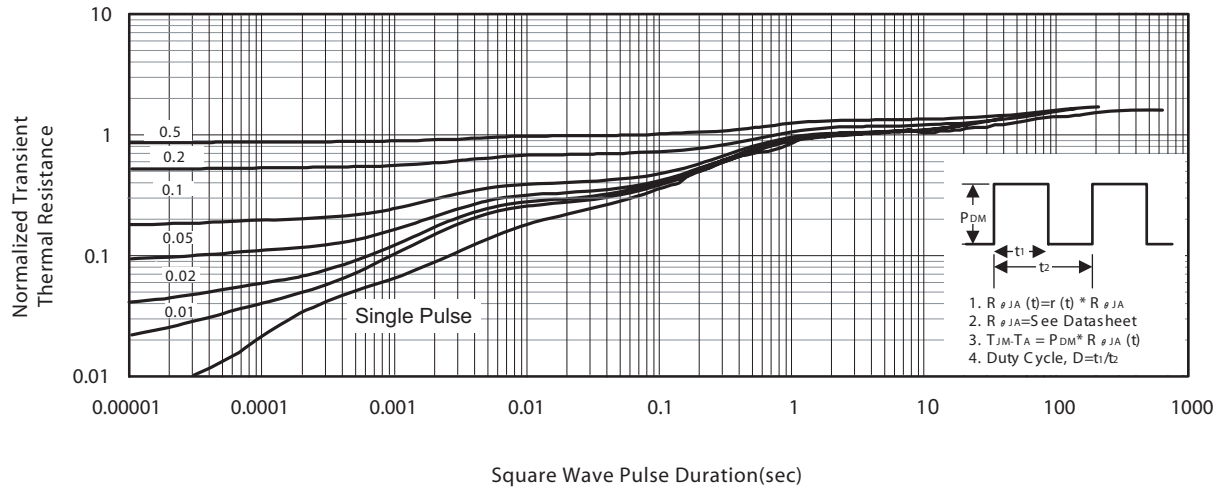
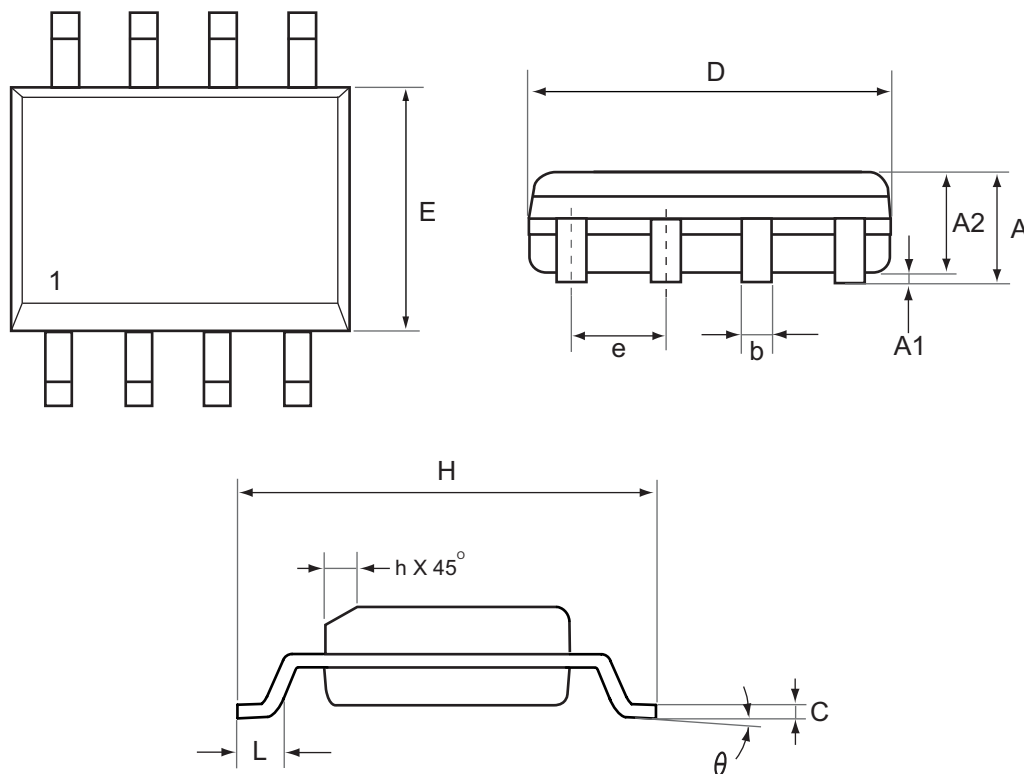


Figure 13. Normalized Thermal Transient Impedance Curve

## PACKAGE OUTLINE DIMENSIONS

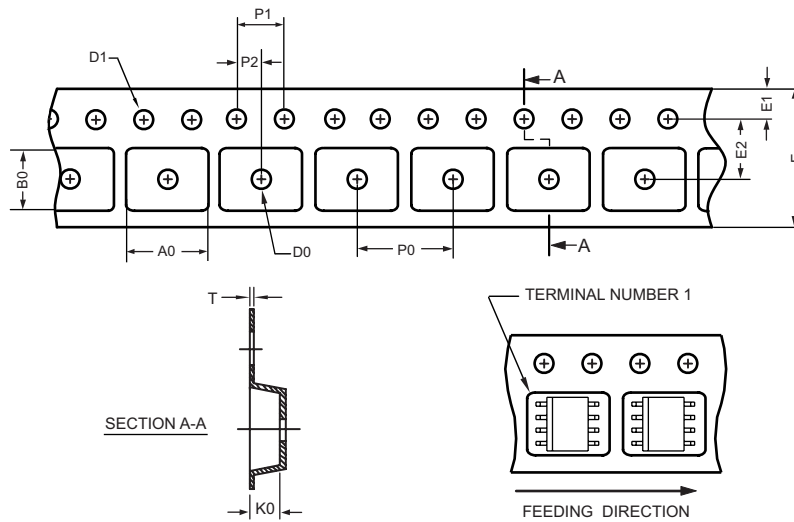
SO-8



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
theta	0°	8°	0°	8°
h	0.25	0.50	0.010	0.020

## SO-8 Tape and Reel Data

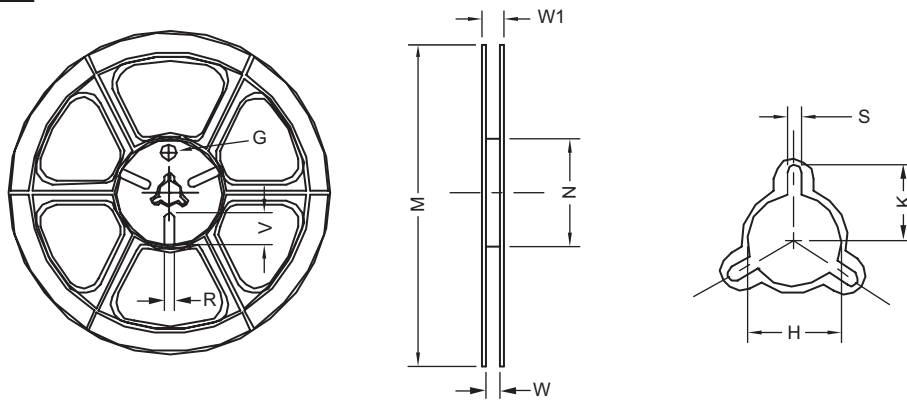
### SO-8 Carrier Tape



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	---	---	---