



STM6920A

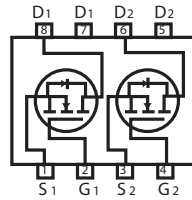
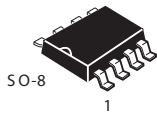
Dual N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
40V	5A	35 @ V _{GS} = 10V 62 @ 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)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	40	V	
Gate-Source Voltage	V _{GS}	±20	V	
Drain Current-Continuous ^a @ T _a	I _D	25°C	5	A
		70°C	4.2	A
-Pulsed ^b	I _{DM}	20	A	
Drain-Source Diode Forward Current ^a	I _S	1.7	A	
Maximum Power Dissipation ^a	P _D	T _a =25°C	2	W
		T _a =70°C	1.44	
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C	

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{θJA}	62.5	°C/W
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N-Channel ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 32V, V_{GS} = 0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.8	3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 6A$		24	35	m ohm
		$V_{GS} = 4.5V, I_D = 5A$		45	62	m ohm
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5V, V_{GS} = 10V$	15			A
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 6A$		10		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V$ $f = 1.0MHz$		759		pF
Output Capacitance	C_{oss}			92		pF
Reverse Transfer Capacitance	C_{rss}			70		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 20V$ $I_D = 1A$ $V_{GS} = 10V$ $R_{GEN} = 3.3\text{ ohm}$		9.2		ns
Rise Time	t_r			21		ns
Turn-Off Delay Time	$t_{d(off)}$			15.5		ns
Fall Time	t_f			4.4		ns
Total Gate Charge	Q_g	$V_{DS} = 20V, I_D = 6A, V_{GS} = 10V$		15.9		nC
		$V_{DS} = 20V, I_D = 6A, V_{GS} = 4.5V$		7.6		nC
Gate-Source Charge	Q_{gs}	$V_{DS} = 20V, I_D = 6A$		2.2		nC
Gate-Drain Charge	Q_{gd}	$V_{GS} = 10V$		4.8		nC

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ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 1.7A$		0.8	1.2	V

Notes

- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$.
- b. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
- c. Guaranteed by design, not subject to production testing.

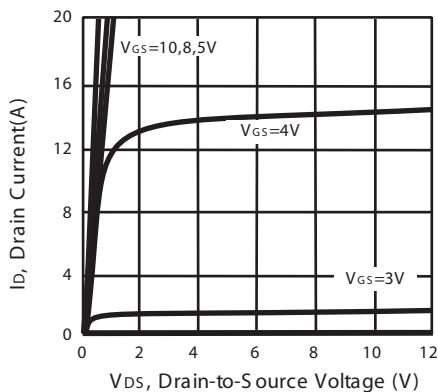


Figure 1. Output Characteristics

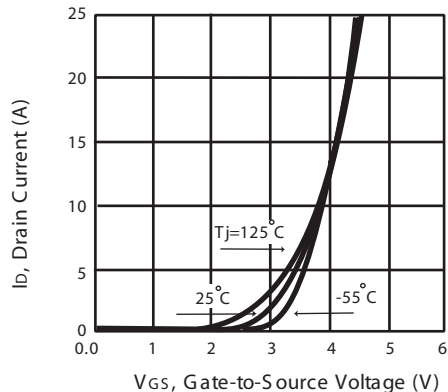


Figure 2. Transfer Characteristics

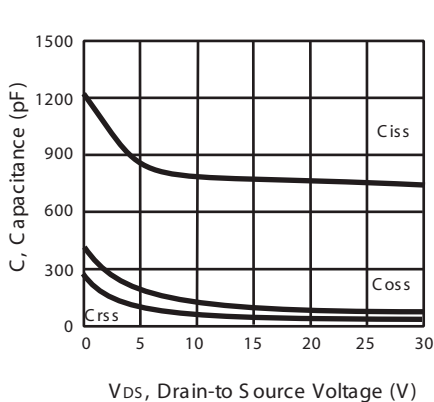


Figure 3. Capacitance

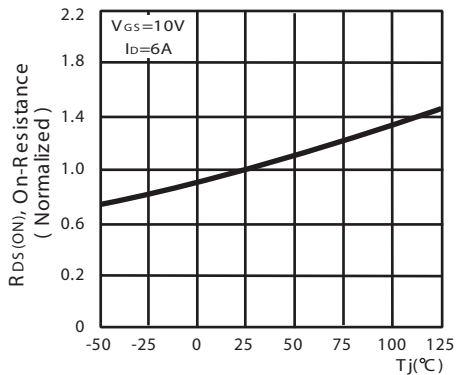
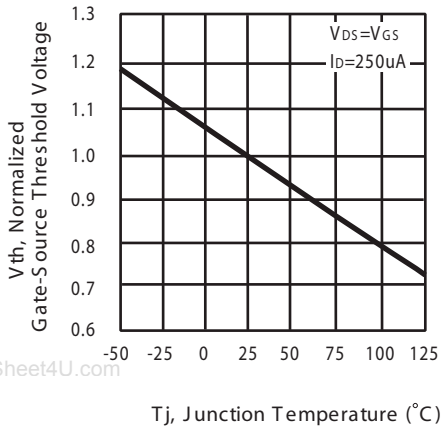


Figure 4. On-Resistance Variation with Temperature

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with Temperature

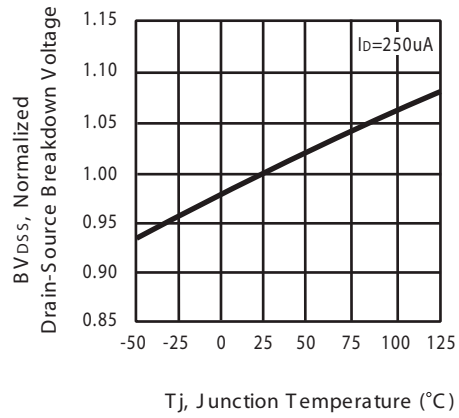


Figure 6. Breakdown Voltage Variation with Temperature

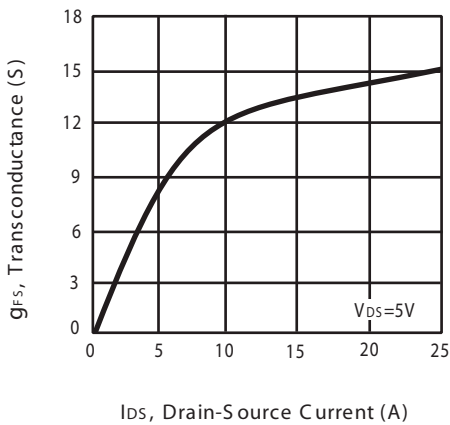


Figure 7. Transconductance Variation with Drain Current

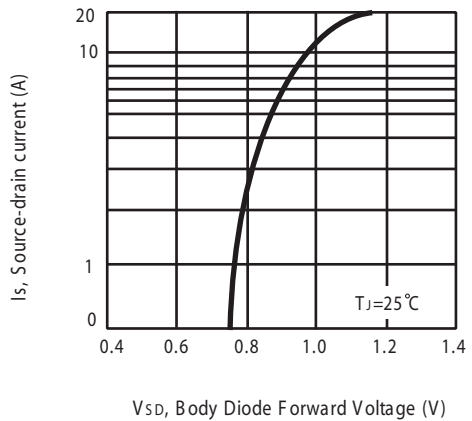


Figure 8. Body Diode Forward Voltage Variation with Source Current

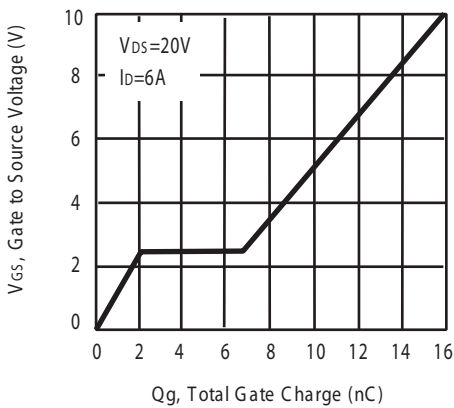


Figure 9. Gate Charge

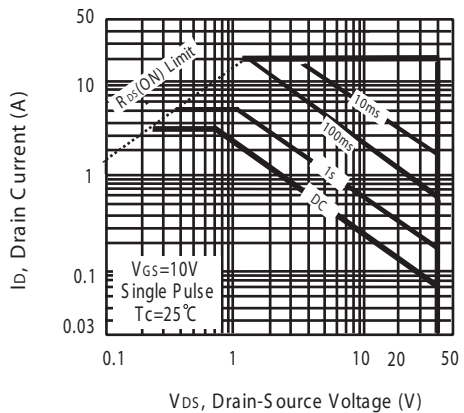


Figure 10. Maximum Safe Operating Area

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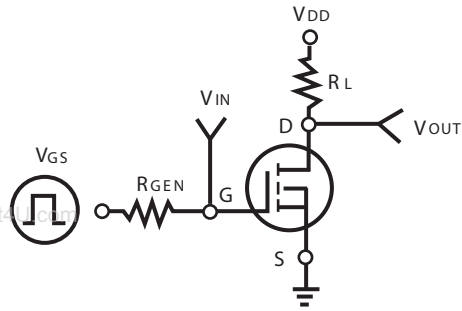


Figure 11. Switching Test Circuit

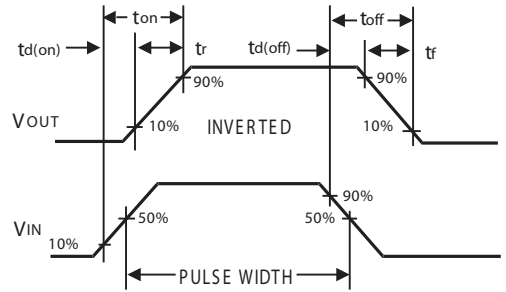
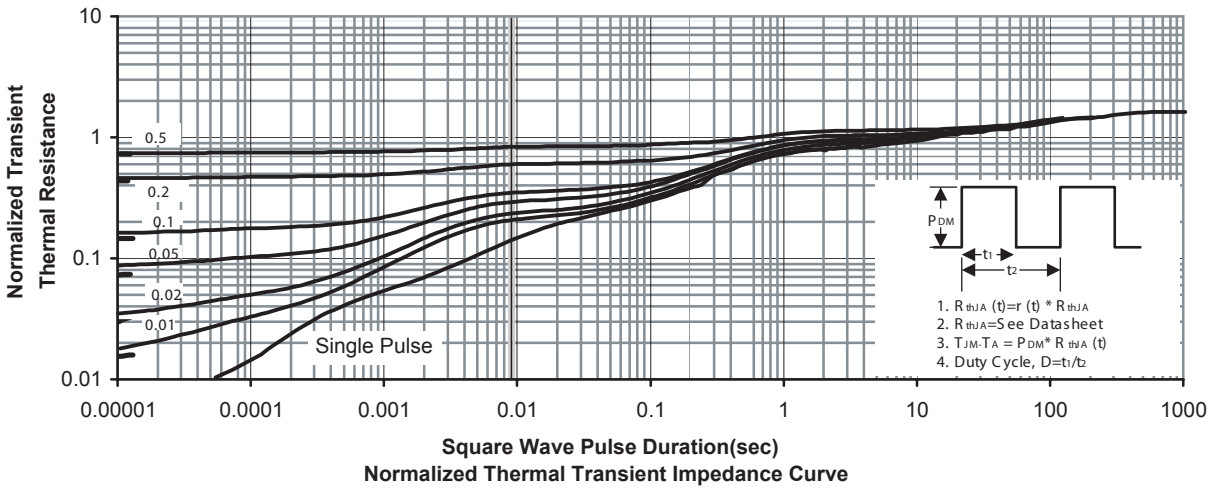


Figure 12. Switching Waveforms

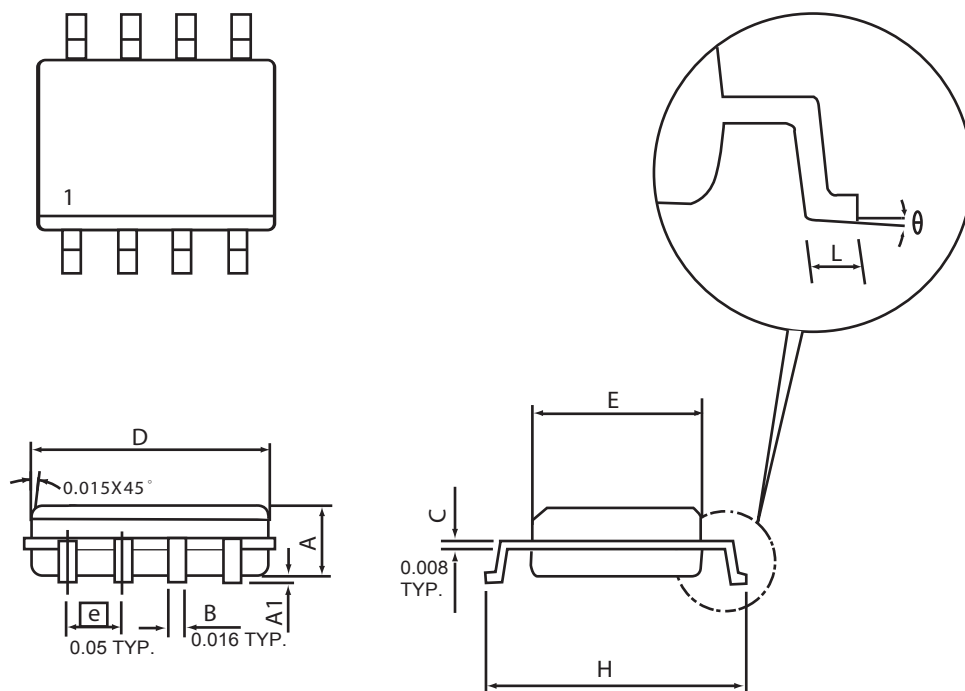


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PACKAGE OUTLINE DIMENSIONS

SO-8

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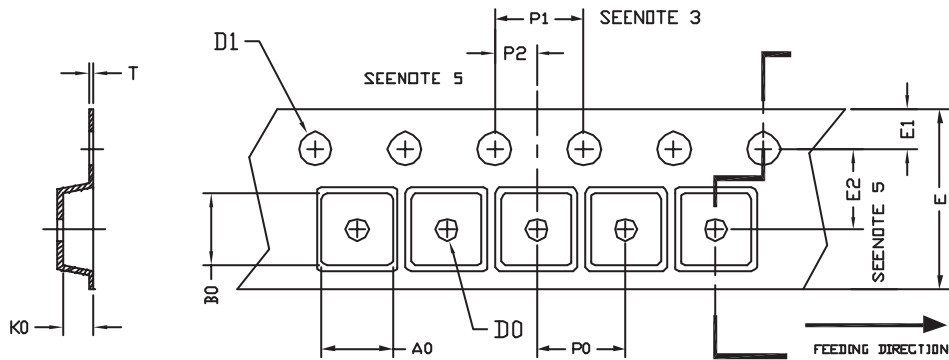


SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	4.98	0.189	0.196
E	3.81	3.99	0.150	0.157
H	5.79	6.20	0.228	0.244
L	0.41	1.27	0.016	0.050
θ	0°	8°	0°	8°

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SO-8 Tape and Reel Data

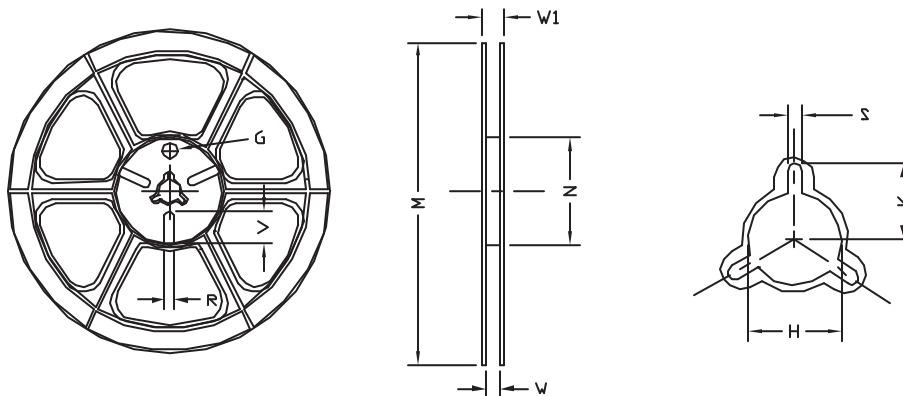
SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.40	5.20	2.10	ϕ 1.5 (MIN)	ϕ 1.5 + 0.1 - 0.0	12.0 \pm 0.3	1.75	5.5 \pm 0.05	8.0	4.0	2.0 \pm 0.05	0.3 \pm 0.05

SO-8 Reel



UNIT:mm

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