

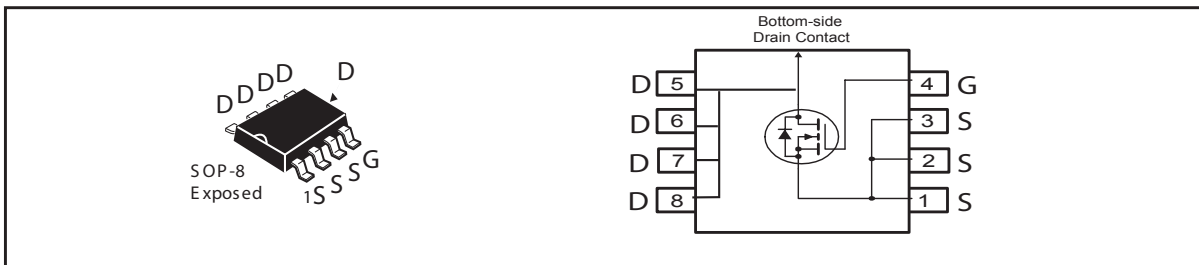


N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) T _{yp}
30V	13A	9 @ V _{GS} = 10V
		13 @ V _{GS} = 4.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- Surface Mount Package.
- Thermal Pad Exposed with Standard SOP-8 Outline



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous ^a @ T _J =25°C -Pulsed ^b	I _D	13	A
	I _{DM}	40	A
Drain-Source Diode Forward Current ^a	I _S	1.7	A
Maximum Power Dissipation ^a	P _D	3.0	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{θJA}	40	°C/W
--	------------------	----	------

STM7096N

ELECTRICAL CHARACTERISTICS (T_C=25°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 =250uA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1	1.7	3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =12A		9	12.5	m ohm
		V _{GS} =4.5V, I _D =10A		13	18	m ohm
On-State Drain Current	I _{D(ON)}	V _{DS} =10V, V _{GS} =10V	10			A
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =10A		25		S
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} =15V, V _{GS} =0V f=1.0MHz		2300		pF
Output Capacitance	C _{OSS}			300		pF
Reverse Transfer Capacitance	C _{RSS}			140		pF
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		3		ohm
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =15V I _D =1A V _{GS} =10V R _{GEN} =6 ohm		21		ns
Rise Time	t _r			20		ns
Turn-Off Delay Time	t _{D(OFF)}			75		ns
Fall Time	t _f			17		ns
Total Gate Charge	Q _g	V _{DS} =15V, I _D =12A, V _{GS} =10V		39.5		nC
		V _{DS} =15V, I _D =12A, V _{GS} =4.5V		17.5		nC
Gate-Source Charge	Q _{gs}	V _{DS} =15V, I _D =12A		5		nC
Gate-Drain Charge	Q _{gd}	V _{GS} =10V		7		nC

STM7096N

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_s = 1.7A$		0.76	1.3	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.

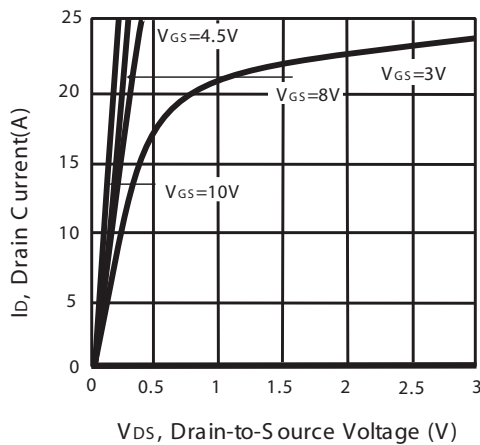


Figure 1. Output Characteristics

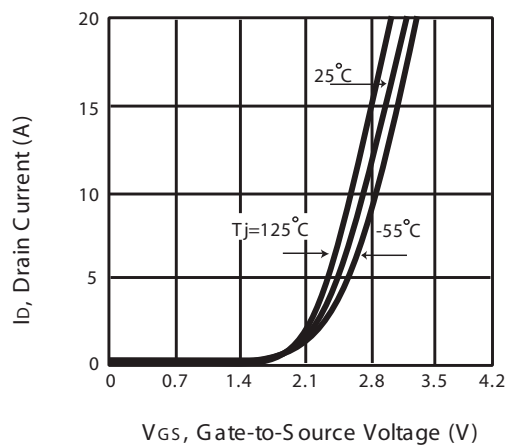


Figure 2. Transfer Characteristics

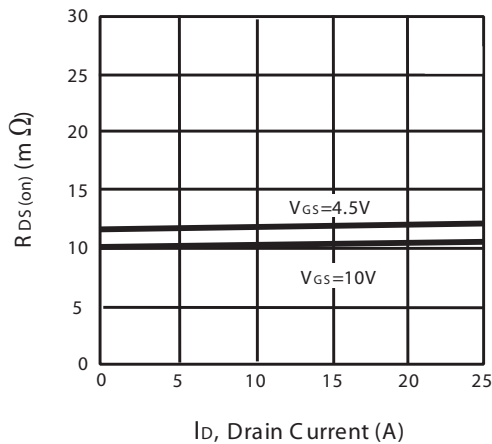


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

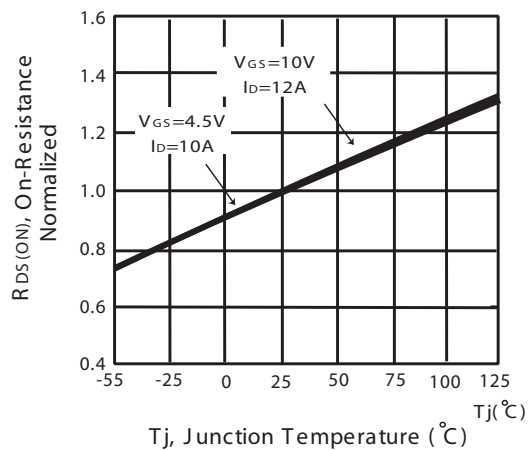


Figure 4. On-Resistance Variation with Drain Current and Temperature

STM7096N

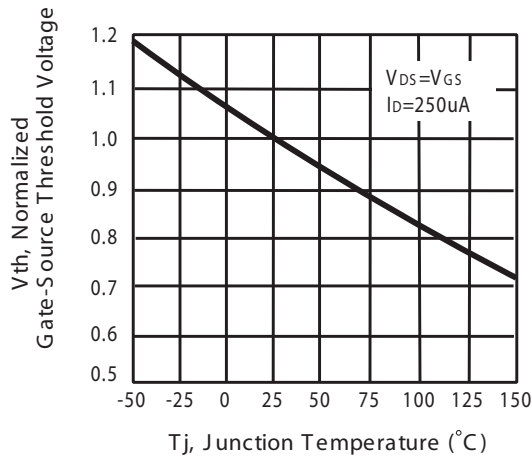


Figure 5. Gate Threshold Variation with Temperature

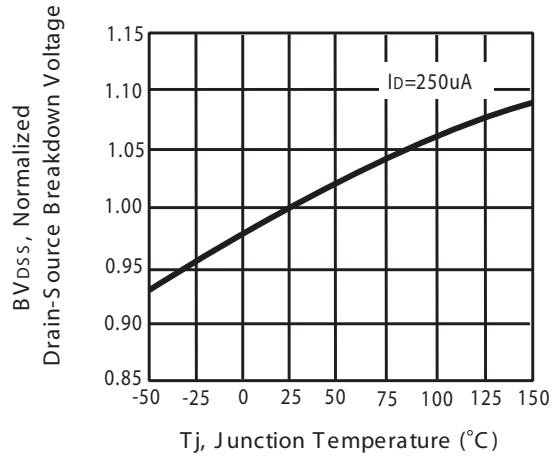


Figure 6. Breakdown Voltage Variation with Temperature

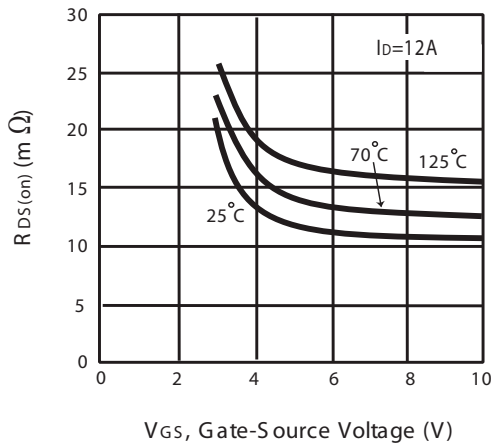


Figure 7. On-Resistance vs. Gate-Source Voltage

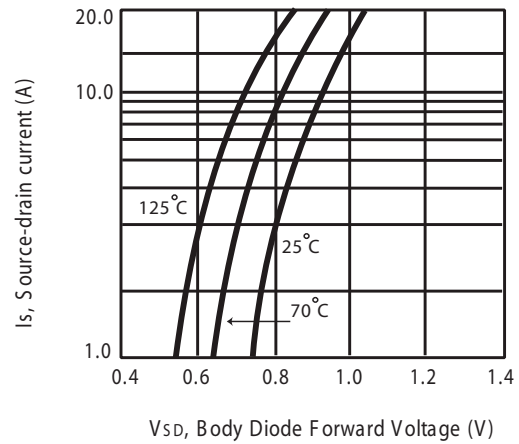
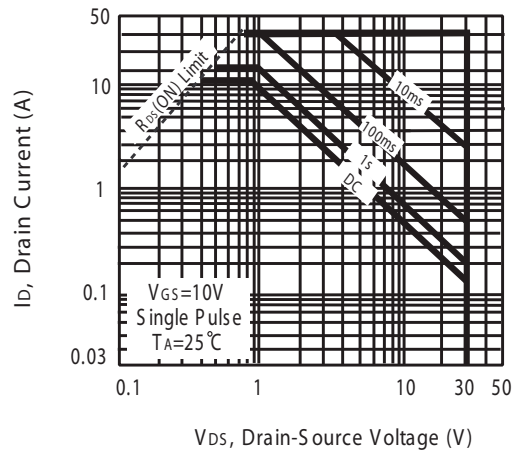
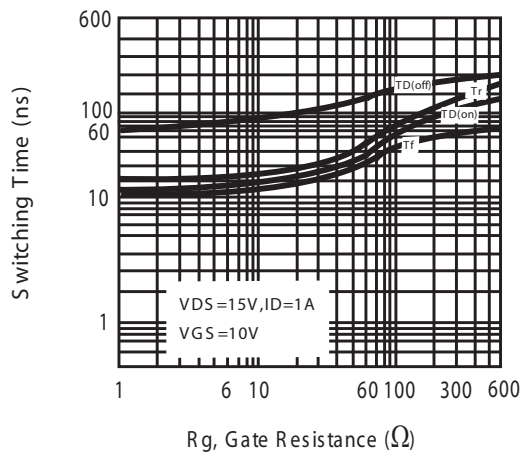
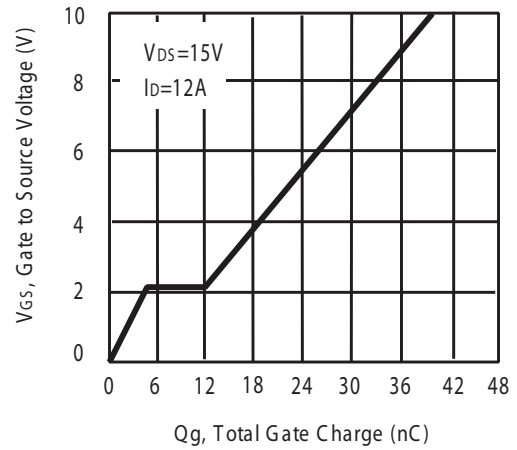
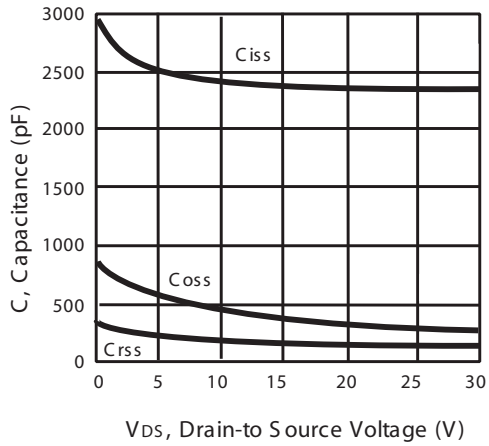


Figure 8. Body Diode Forward Voltage Variation with Source Current

STM7096N



STM7096N

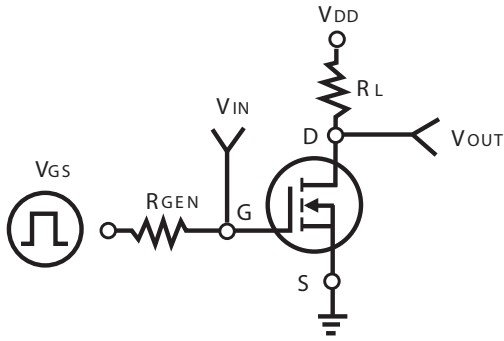


Figure 11. Switching Test Circuit

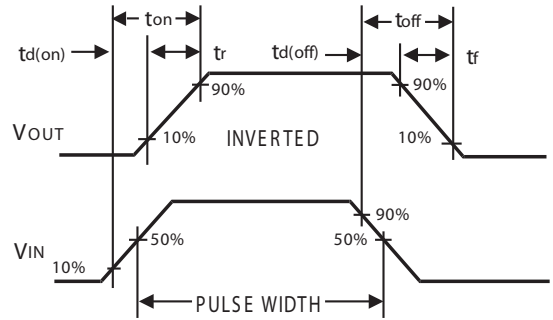
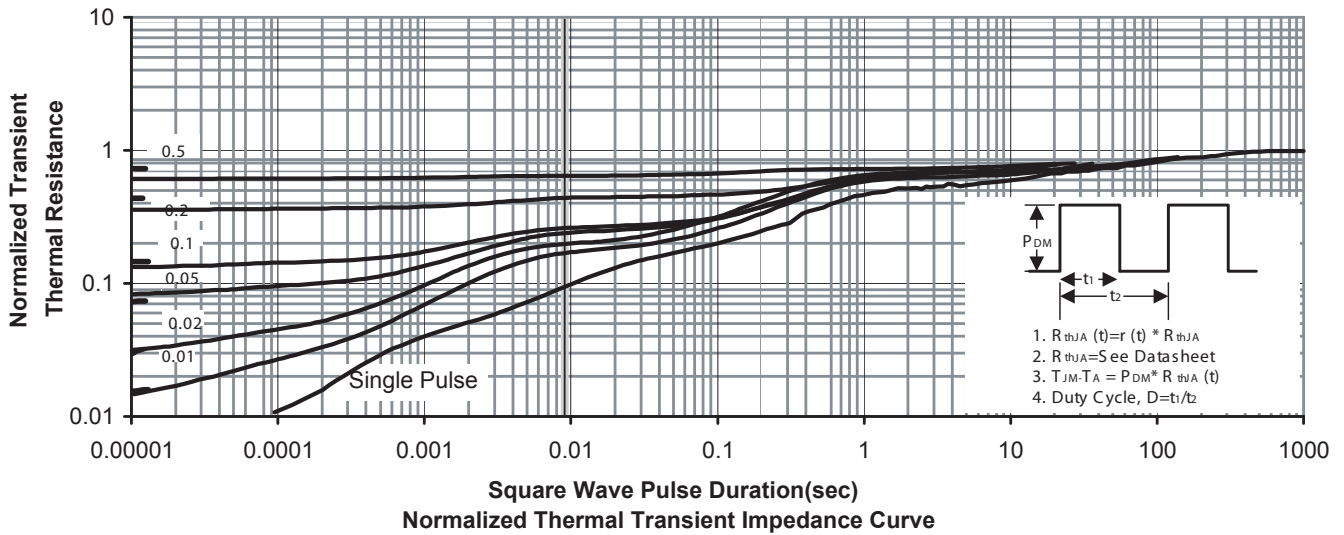


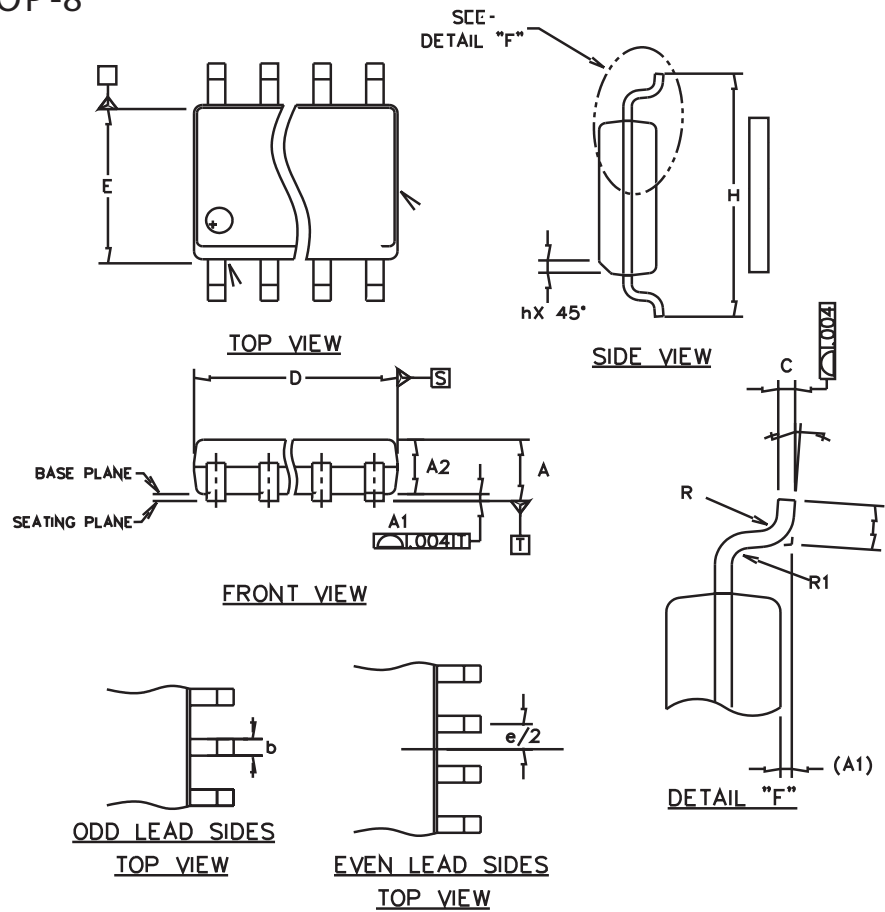
Figure 12. Switching Waveforms



STM7096N

PACKAGE OUTLINE DIMENSIONS

SOP-8



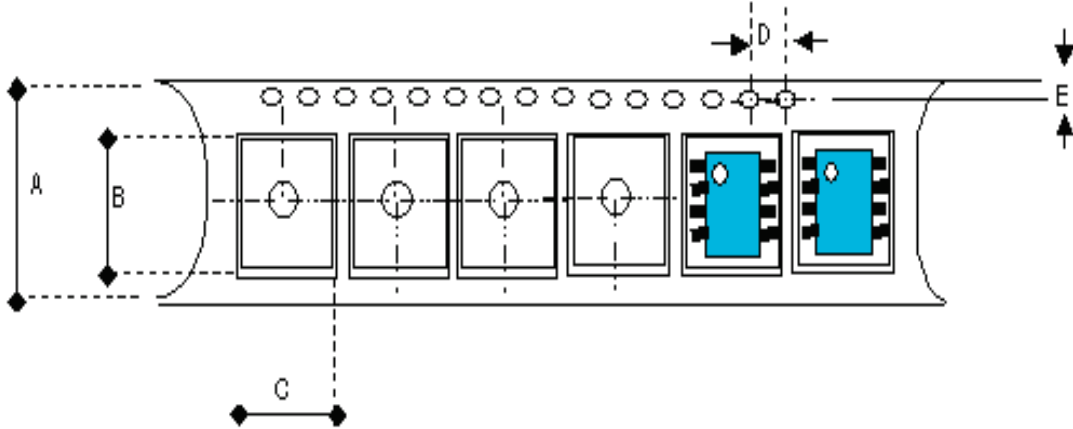
SYMBOL	MIN.	NOM.	MAX.	NOTE
A	.055	—	.069	1
A1	.0005	—	.004	1,5
A2	.050	—	.064	1
b	.013	—	.020	1
C	.008	—	.010	1,5
R	.003	—	—	1
R1	.003	—	—	1
e	.050 BSC.			1
E	.150	—	.157	1,4
h	.010	—	.019	1
H	.228	—	.244	1,5
L	.020	—	.028	1,6
Q1	0°	—	8°	1

VAR	D			N
	MIN.	NOM.	MAX.	
AA	0.189	—	—	8
AB	0.337	—	—	14
AC	0.386	—	—	16
NOTES	1,3	—	—	16

STM7096N

SO-8 Tape and Reel Data

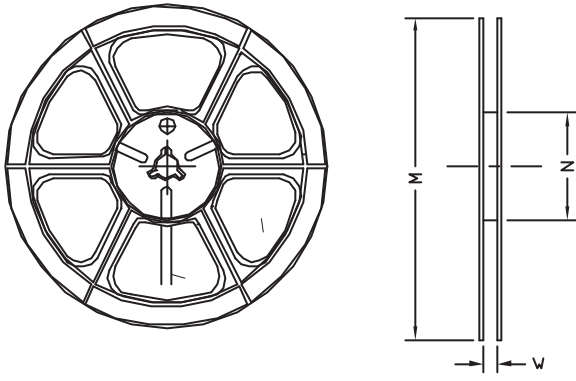
SO-8 Carrier Tape



unit:mm

PACKAGE	A	B	C	D	E
SOP 8N	12.0	5.0	4.0	6.5	1.5
150mil	±0.3	±0.1	±0.1	±0.1	±0.1

SO-8 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W
12 mm	φ 300	300	101	10 ± 0.2