



South Sea Semiconductor

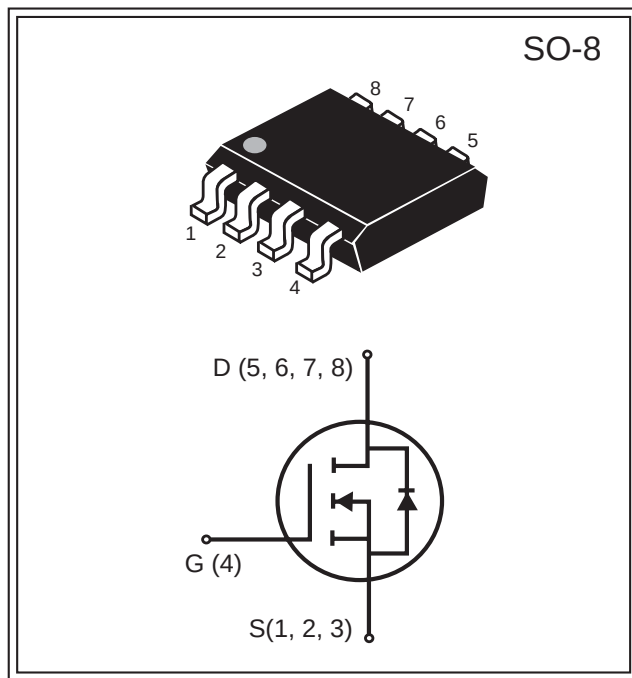
SSM4410

N-Channel Enhancement Mode MOSFET

Product Summary		
V _{DS} (V)	I _D (A)	R _{DS(ON)} (mΩ) Max
30V	10A	13.5 @V _{GS} = 10V
		20 @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}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous @ T _J = 25°C	I _D	10	A
-Pulsed ^b	I _{DM}	39	A
Drain-Source Diode Forward Current ^a	I _S	1.7	A
Maximum Power Dissipation ^a	P _D	2.5	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}	50	°C/W

South Sea Semiconductor reserves the right to make changes to improve reliability or manufacturability without advance notice.

South Sea Semiconductor, September 2005 (Rev 2.0)

**P-Channel Electrical Characteristics (T_A = 25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250 μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} I _D =250 μA	1	1.7	3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =9A		11	13.5	mΩ
		V _{GS} =4.5V, I _D =5A		16	20	
On-State Drain Current	I _{D(ON)}	V _{DS} =10V, V _{GS} =10V	20			A
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =9A		13		S
Input Capacitance	C _{ISS}	V _{DS} =15V		1495		pF
Output Capacitance	C _{OSS}	V _{GS} =0V		381		
Reverse Transfer Capacitance	C _{RSS}	f=1.0MHz		239		
Turn-On Delay Time	t _{D(ON)}	V _{DD} =15V,		30		ns
Rise Time	t _r	I _D =1A,		9		
Turn-Off Delay Time	t _{D(OFF)}	V _{GS} =10V,		50		
Fall Time	t _f	R _{GEN} =6Ω,		28		
Total Gate Charge	Q _g	V _{DS} =15V, I _D =9A, V _{GS} =10V		30		nC
		V _{DS} =15V, I _D =9A, V _{GS} =4.5V		15		
Gate-Source Charge	Q _{gs}	V _{DS} =15V, I _D =9A,		5.5		
Gate-Drain Charge	Q _{gd}	V _{GS} =10V		7.5		
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _D =1.7A		0.8	1.2	V

Notes :

- Surface Mounted on FR4 Board, t ≤ 10 sec.
- Pulse Test : Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

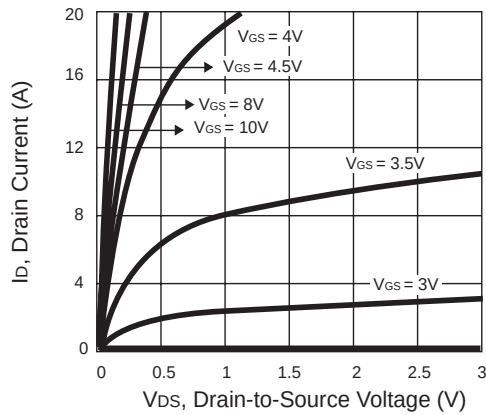


Figure 1. Output Characteristics

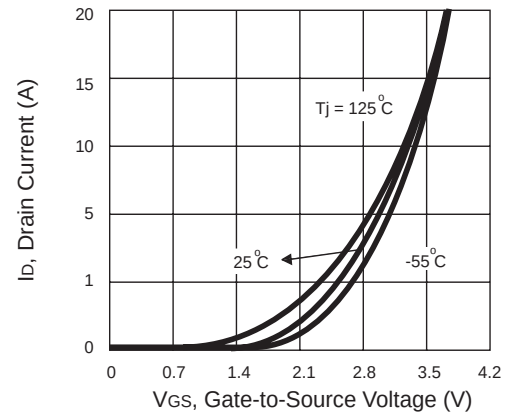


Figure 2. Transfer Characteristics

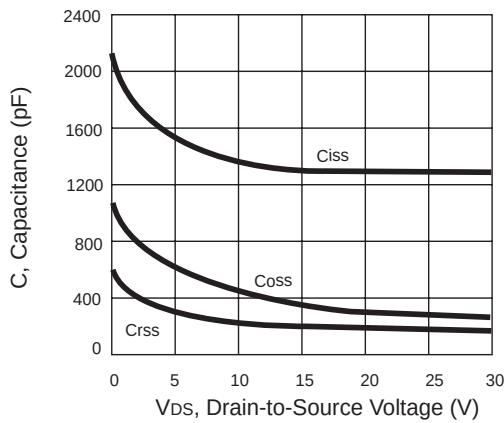


Figure 3. Capacitance

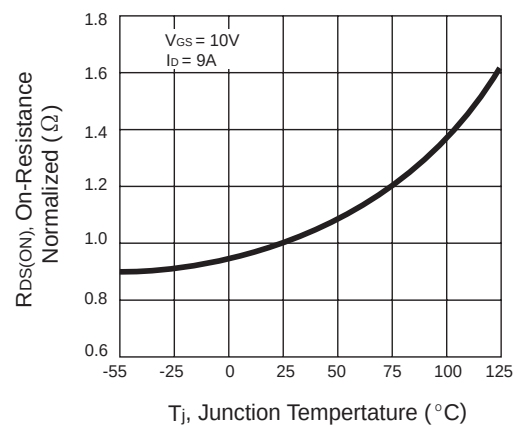


Figure 4. On-Resistance Variation with Temperature

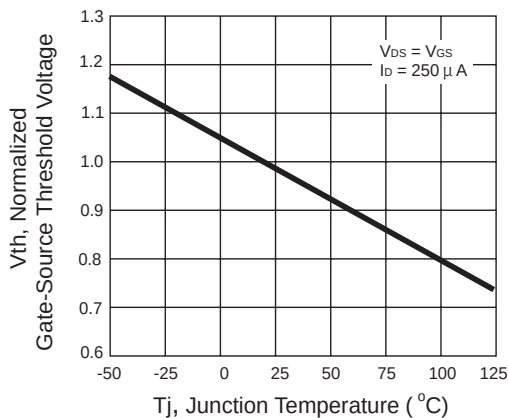


Figure 5. Gate Threshold Variation with Temperature

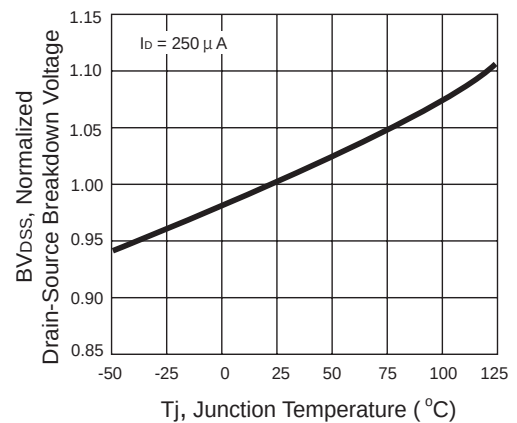


Figure 6. Breakdown Voltage Variation with Temperature

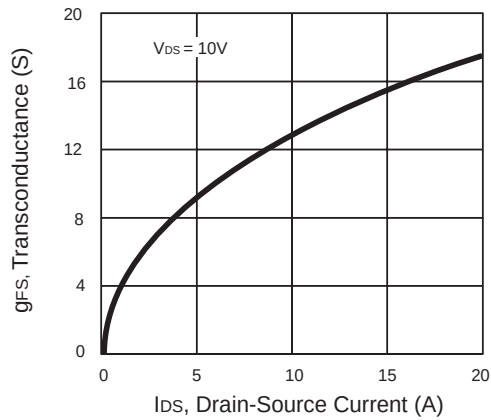


Figure 7. Transconductance Variation with Drain Current

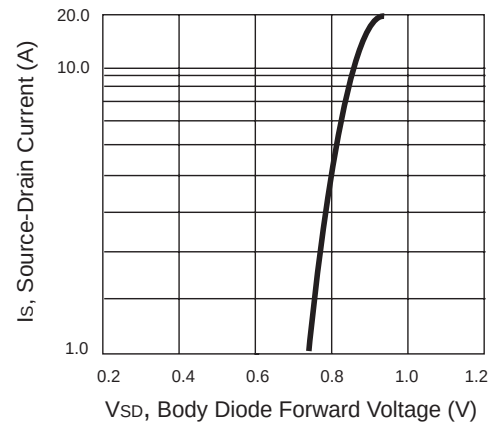


Figure 8. Body Diode Forward Voltage Variation with Source Current

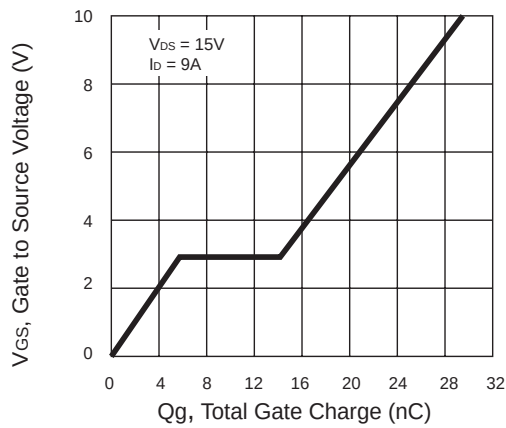


Figure 9. Gate Charge

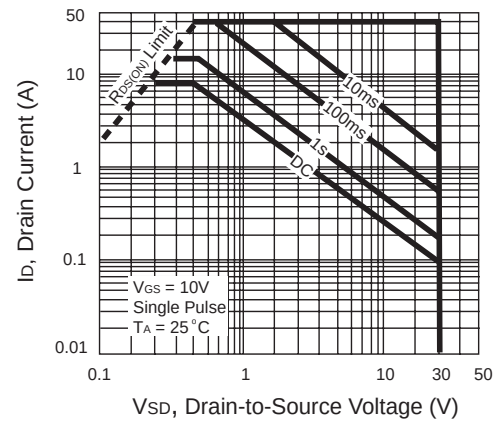


Figure 10. Maximum Safe Operating Area

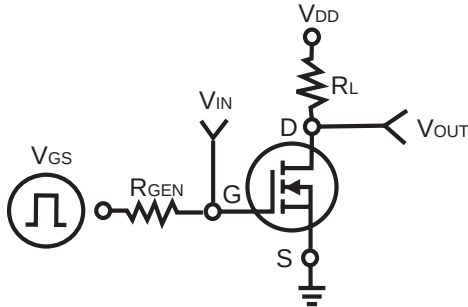


Figure 11. Switching Test Circuit

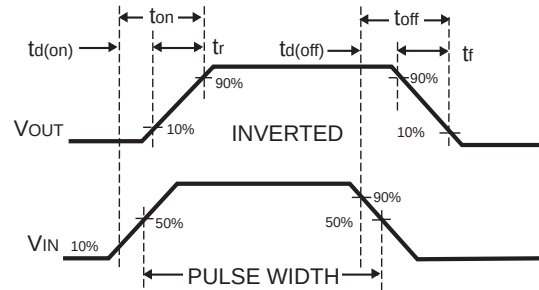


Figure 12. Switching Waveforms

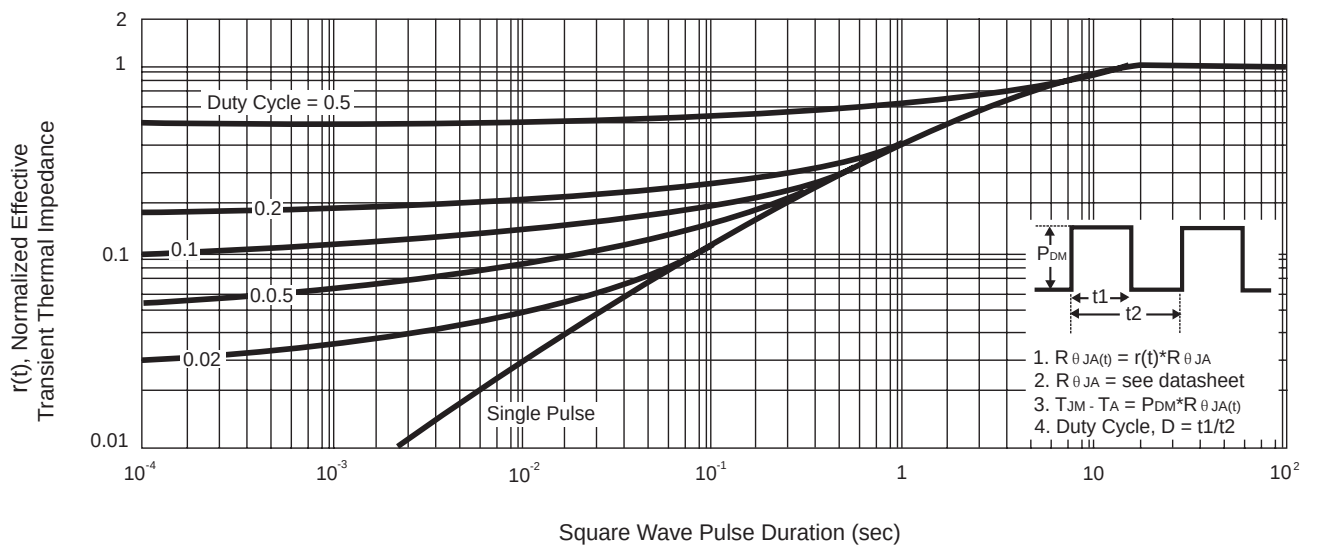
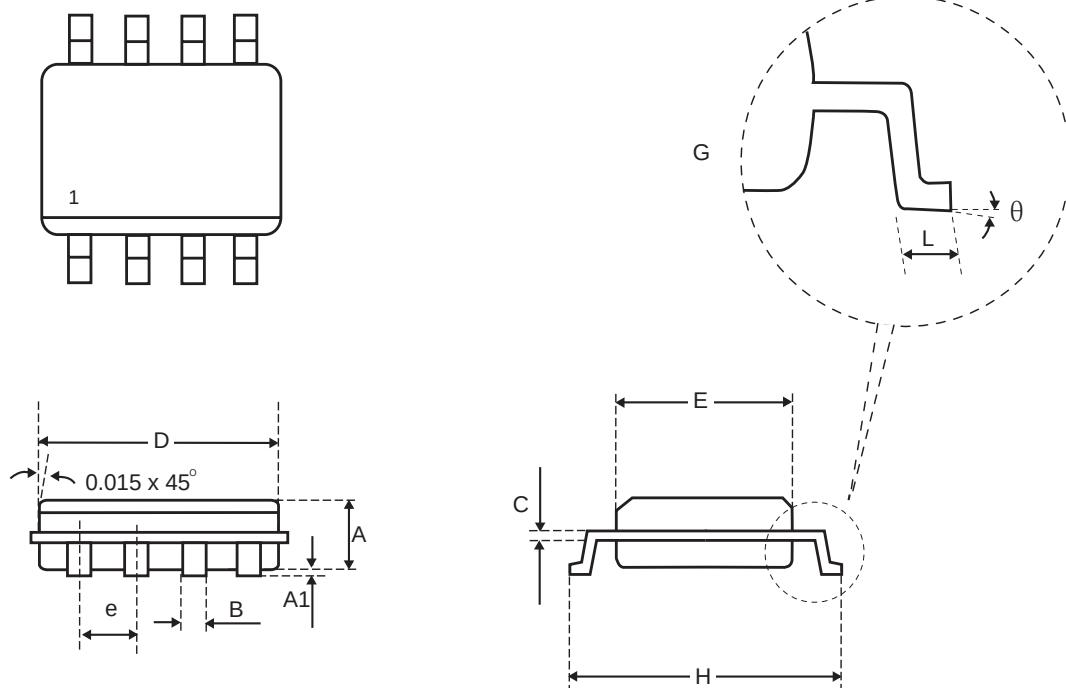


Figure 13. Normalized Thermal Transient Impedance Curve



Package Outline Dimensions

SO-8

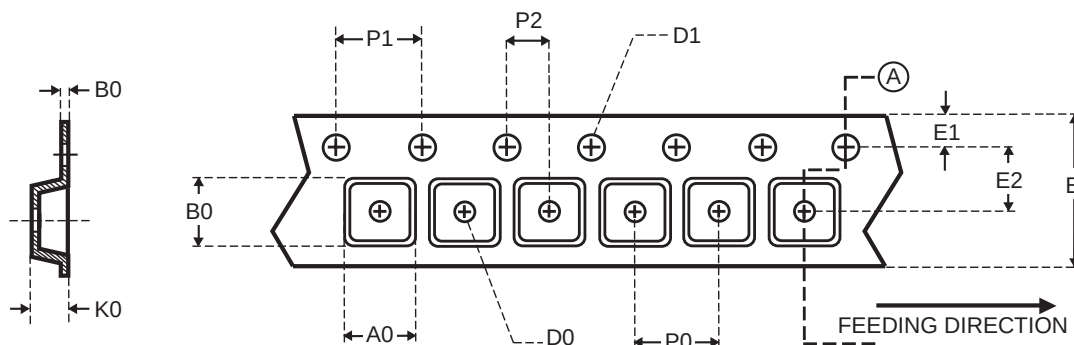


SYMBOLS	MILLIMETERS		INCHES	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
B	0.41 Typ.		0.016 Typ.	
C	0.20 Typ.		0.008 Typ.	
D	4.80	4.98	0.189	0.196
E	3.81	3.99	0.150	0.157
e	1.25 Typ.		0.05 Typ.	
H	5.79	6.20	0.228	0.244
L	0.41	1.27	0.016	0.050
θ	0°	8°	0°	8°



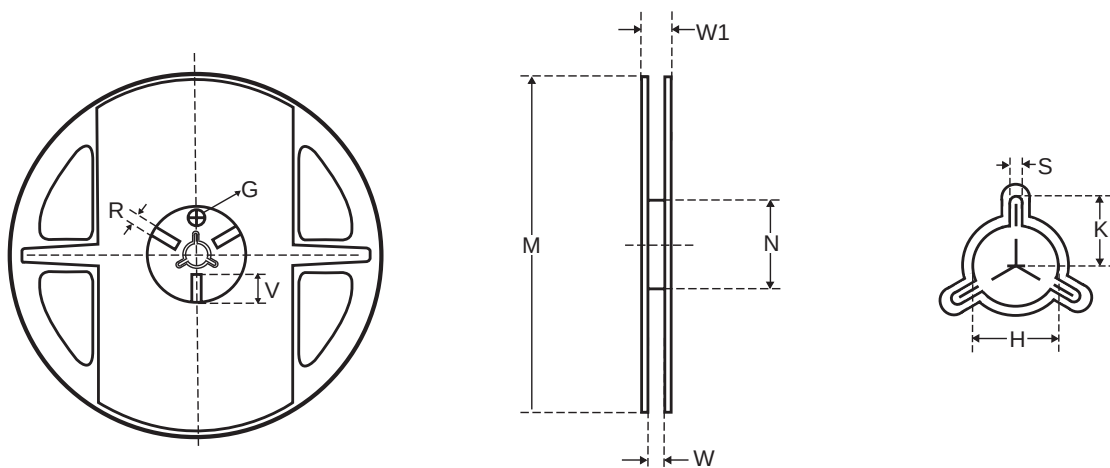
Carrier Tape & Reel Dimensions

SO-8



Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150 mil	6.40	5.20	2.10	$\psi 1.50$ (Min.)	$\psi 1.50$ $+0.10$ -0.10	12.00 ± 0.30	1.75	5.50 ± 0.05	8.00	4.00	2.00 ± 0.05	0.30 ± 0.05

UNIT : mm



Tape size	Reel Size	M	N	W	W1	H	K	S	G	R	V
12mm	$\psi 330$	330 ± 1	62 ± 1.5	12.4 ± 0.2	16.8 -0.4	$\psi 12.75$ ± 0.15	-	2.0 ± 0.15	-	-	-

UNIT : mm