SHANGHAI SINO-IC
MICROELECTRONICS CO., LTD.

SE30P09D
P-Channel Enhancement-Mode MOSFET

Revision: A

General Description

Advanced trench technology to provide excellent RDS(ON), low gate charge and low operation voltage. This device is suitable for using as a load switch or in PWM applications.

● Simple Drive Requirement

● Small Package Outline
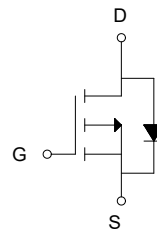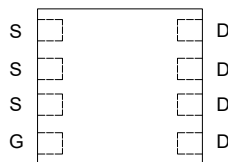
● Surface Mount Device

Features

For a single MOSFET

● V_{DS} = -30V

● $R_{DS(ON)}$ = 15mΩ @ V_{GS}=-10V

● $R_{DS(ON)}$ = 21mΩ @ V_{GS}=-4.5V

Pin configurations

See Diagram below

Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current	Continuous	I_D	-9	A
	Pulsed		-50	
Avalanche Current		I_{AR}	33	A
Repetitive Avalanche Energy L=0.1mH		E_{AR}	54	mJ
Total Power Dissipation	@TA=25℃	P_D	2	W
Operating Junction Temperature Range		T_J	-55 to 150	℃

SE30P09D

Electrical Characteristics   (TJ=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS (Note 2)						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=-250μA, V_{GS}=0 V	-30			V
I_{DSS}	Drain to Source Leakage Current	V_{DS}= -30V, V_{GS}=0V			-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= 20V			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=-250μA	-1	-1.5	-3	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance [2]	V_{GS}=-10V, I_D=-10A	-	15	20	mΩ
		V_{GS}=-4.5V, I_D=-7A		21	30	mΩ
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, f=1MHz		2060	2600	pF
C_{oss}	Output Capacitance			370		pF
C_{rss}	Reverse Transfer Capacitance			295		pF
SWITCHING PARAMETERS						
Q_g	Total Gate Charge [2]	V_{GS}=-10V, V_{DS}=-15V, I_D=-9A		30	39	nC
Q_{gs}	Gate Source Charge			4.6		nC
Q_{gd}	Gate Drain Charge			10		nC
$t_{d(on)}$	Turn-On Delay Time	V_{GS}=-10V, V_{DS}=-15V, R_{GEN}=3Ω, R_L=1Ω		11		ns
$t_{d(off)}$	Turn-Off Delay Time			24		ns
$t_{d(r)}$	Turn-On Rise Time			9.4		ns
$t_{d(f)}$	Turn-Off Fall Time			12		ns

Thermal Resistance

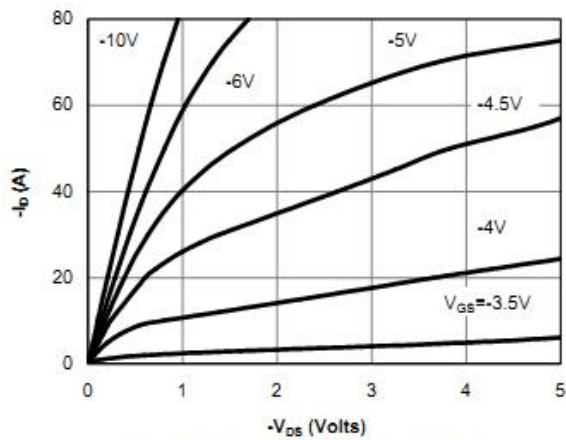| Symbol	Parameter	Typ	Max	Units
$R_{θJA}$	Junction to Ambient (t≦10s)	48	62.5	℃/W

Typical Characteristics
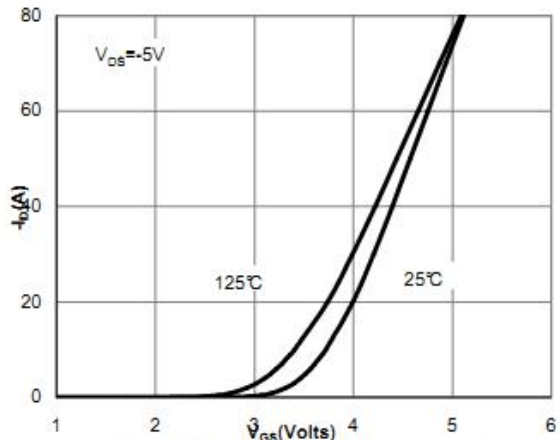

Fig 1: On-Region Characteristics (Note E)

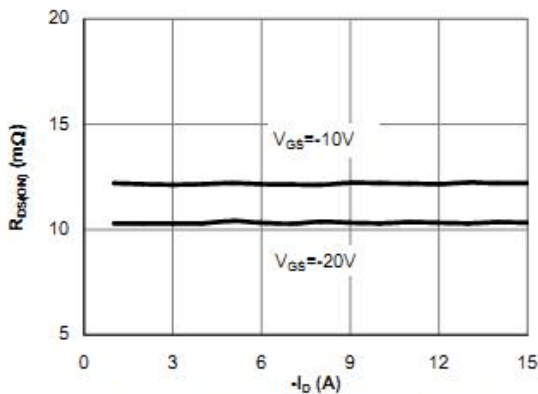Figure 2: Transfer Characteristics (Note E)

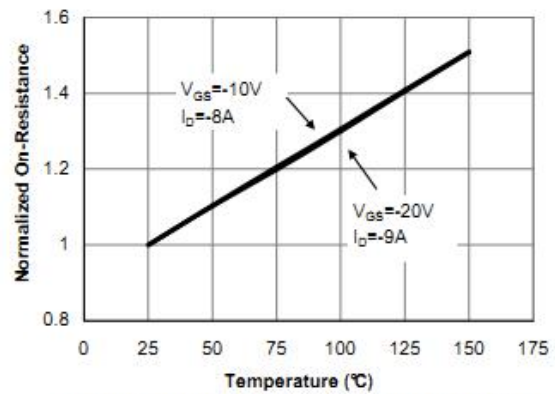Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

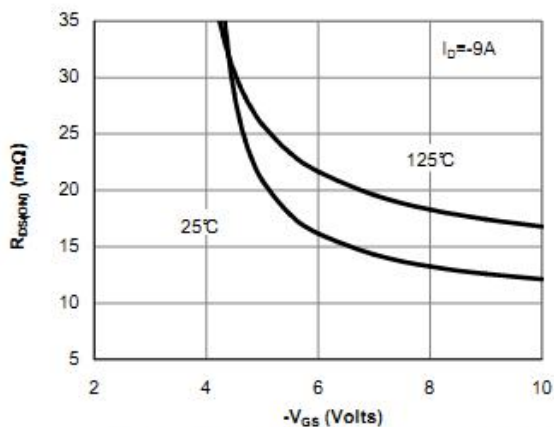Figure 4: On-Resistance vs. Junction Temperature (Note E)

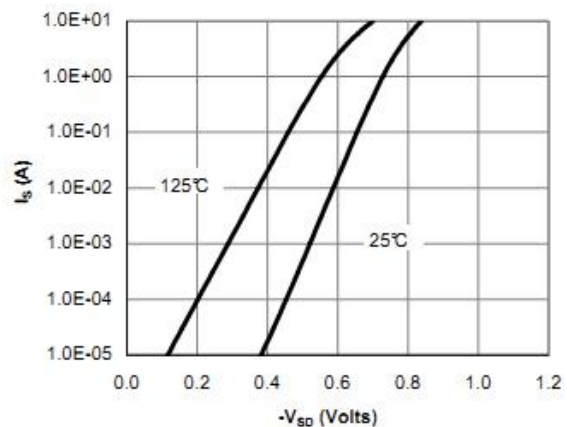Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

Figure 6: Body-Diode Characteristics (Note E)
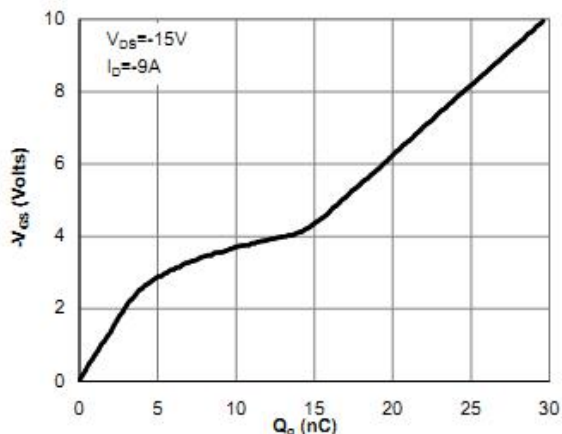
Typical Characteristics
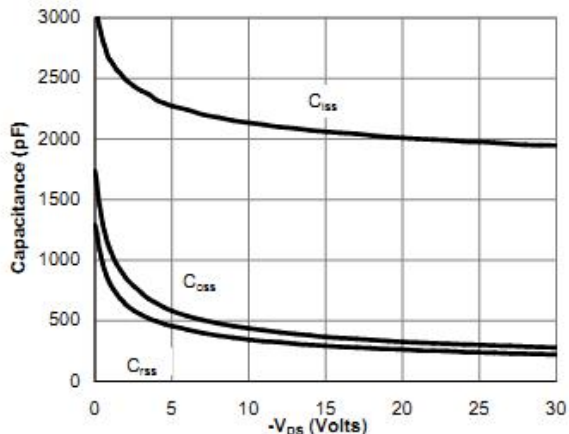

Figure 7: Gate-Charge Characteristics
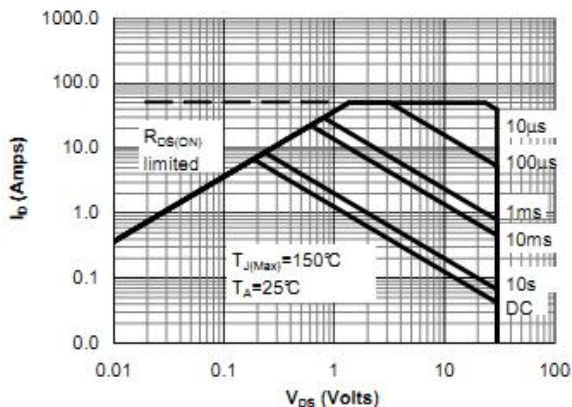

Figure 8: Capacitance Characteristics

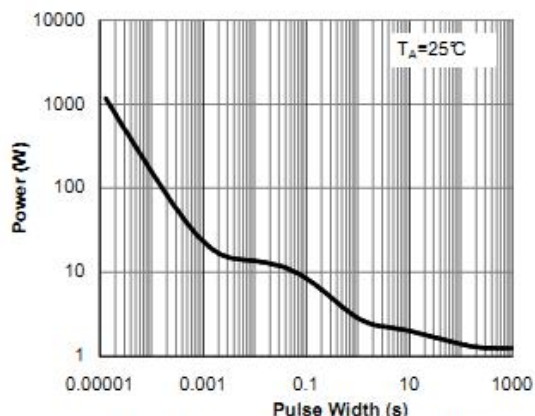Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

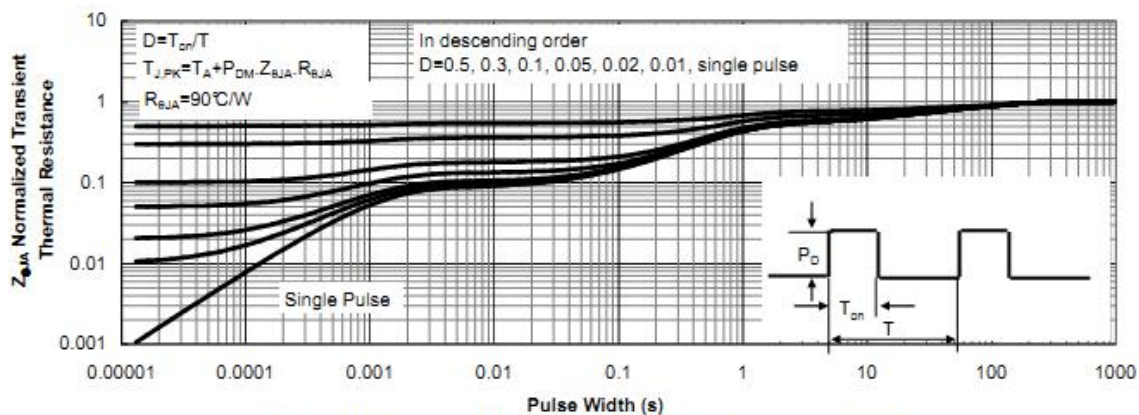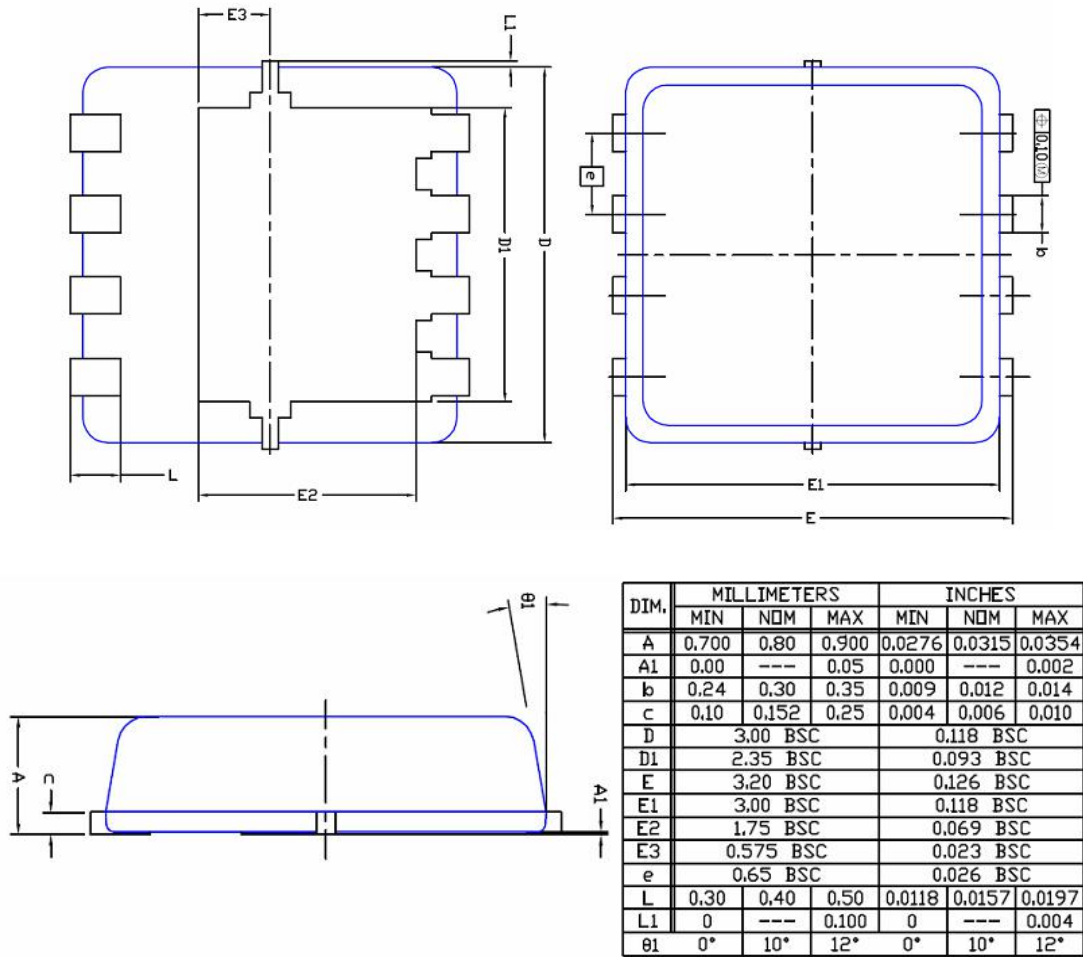Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

SE30P09D

Package Outline Dimension

DFN3X3

DIM.	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.80	0.900	0.0276	0.0315	0.0354
A1	0.00	---	0.05	0.000	---	0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
c	0.10	0.152	0.25	0.004	0.006	0.010
D	3.00 BSC			0.118 BSC		
D1	2.35 BSC			0.093 BSC		
E	3.20 BSC			0.126 BSC		
E1	3.00 BSC			0.118 BSC		
E2	1.75 BSC			0.069 BSC		
E3	0.575 BSC			0.023 BSC		
e	0.65 BSC			0.026 BSC		
L	0.30	0.40	0.50	0.0118	0.0157	0.0197
L1	0	---	0.100	0	---	0.004
θ1	0°	10°	12°	0°	10°	12°

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