N-Channel Depletion Mode Lateral DMOS FET

calogic CORPORATION

SD2100 / SST2100

FEATURES

- **Fast Switching** . . . . . t_{ON} **1.0ns**
- **Low Capacitance** . . . . . C_{rss} **2pf**
- **Low** R_{ON} **50Ω**

APPLICATIONS

- **Analog Switches**
- **Amplifiers**

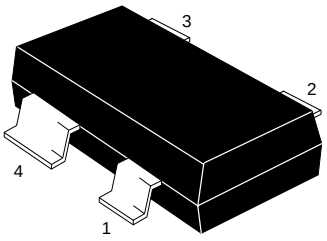
DESCRIPTION

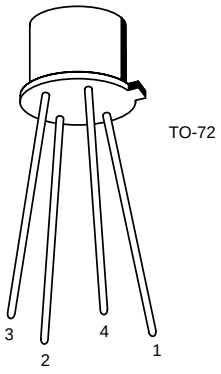
The SD2100/SST2100 is a depletion mode DMOS lateral FET that provides ultra high speed switching with very low capacitance. The product is available in TO-72 and surface mount SOT-143.

ORDERING INFORMATION

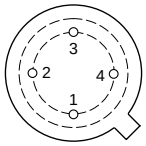
Part	Package	Temperature Range
SD2100	TO-72	-55°C to +125°C
SST2100	SOT-143	-55°C to +125°C
XSD2100	Sorted Chips in Carriers	-55°C to +125°C

CONNECTION DIAGRAMS

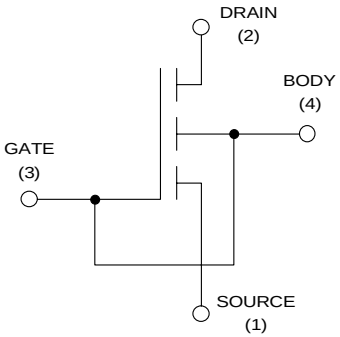


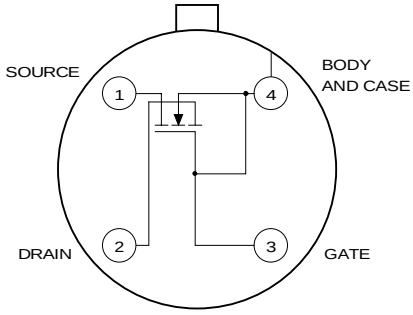


1 SOURCE
2 DRAIN
3 GATE
4 SUBSTRATE



BOTTOM VIEW





BODY IS INTERNALLY CONNECTED TO THE CASE (TOP VIEW)

PART MARKING (SOT-231)	
SST2100	D10

CD1-2

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

SYMBOL	PARAMETERS/TEST CONDITIONS	LIMITS	UNITS
V_{GS}	Gate-Source Voltage	±25	V
V_{DS}	Drain-Source Voltage	25	
I_D	Drain Current	50	mA
P_D	Power Dissipation	300	mW
	Power Derating	2.4	mW/°C
T_J	Operating Junction Temperature	-55 to 150	°C
T_{stg}	Storage Temperature	-55 to 150	
T_L	Lead Temperature (1/16" from case for 10 sec.)	300	

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

SYMBOL	PARAMETER	TYP[1]	MIN	MAX	UNIT	TEST CONDITIONS	
STATIC							
$V_{(BR)DS}$	Drain-Source Breakdown Voltage	25	15		V	V_{GS} = V_{BS} = -5V, I_D = 1µA	
I_{GSS}	Gate Reverse Current	±0.05		±1	nA	V_{GS} = ±25V, V_{DS} = V_{BS} = 0V	
I_{DSS}	Saturation Drain Current	7	0.5	10	mA	V_{DS} = 10V, V_{GS} = V_{BS} = 0V	
$V_{GS(OFF)}$	Gate-Source Cutoff	-1.5		-2	V	V_{DS} = 10V, I_D = 1µA, V_{BS} = 0V	
V_{GS}	Gate-Source Voltage	-0.3	-1	1		V_{DG} = 10V, V_{BS} = 0V	I_D = 5mA
		0.4	0	1.5			I_D = 10mA
$r_{DS(ON)}$	Drain-Source On-Resistance	120		200	Ω	I_D = 100µA, V_{BS} = 0V	V_{GS} = 0V
		40		50			V_{GS} = 5V
DYNAMIC							
g_{fs}	Forward Transconductance	8000	1000		µS	V_{DS} = 10V, V_{GS} = V_{BS} = 0V, f = 1kHz	
g_{os}	Output Conductance	250		500			
g_{fs}	Forward Transconductance	10000	7000			V_{DG} = 10V, V_{BS} = 0V, I_D = 10mA, f = 1kHz	
g_{os}	Output Conductance	350		500			
C_{iss}	Common-Source Input Capacitance	5		6	pF	V_{DS} = 10V, f = 1MHz, V_{GS} = V_{BS} = -5V	
C_{rss}	Reverse Transfer Capacitance	1		2			
SWITCHING							
$t_{d(ON)}$	Turn-ON Time	0.7			ns	V_{DD} = 5V, R_L = 680Ω, V_{IN} = -4V to -2V	
t_r		0.4					
t_{OFF}	Turn-OFF Time	5					

Note1: For design aid only, not subject to production testing.