

Technical Data
**N-CHANNEL DMOS
 FET SWITCH**

SD- 403

Description:

The SD403 series consists of enhancement-mode MOSFETs designed for high speed low-glitch switching in audio, video, and high-frequency applications. The SD403 is optimized as a high speed driver. Improvements over competitive parts allow a BVsb to be specified for use in analog switches.

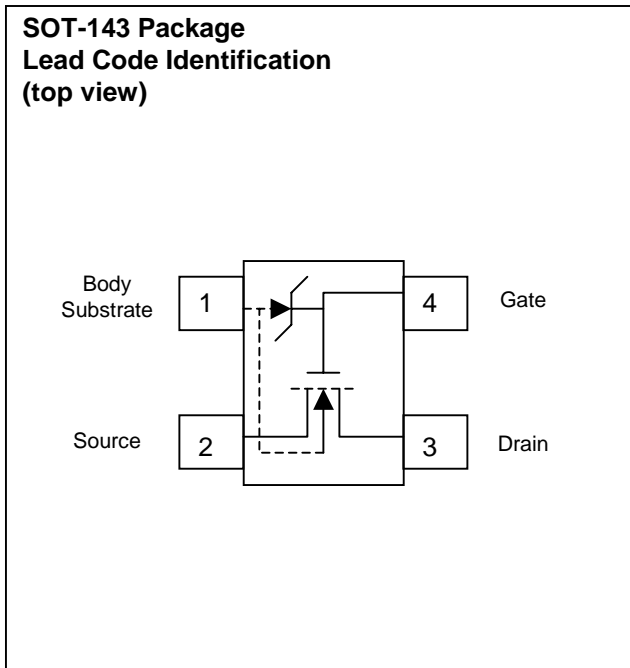
The SD403 series uses CALMOS TECHNOLOGIES ULTRA REL DMOS Process for reliability and robust performance. These MOSFETs utilize lateral construction to achieve low capacitance and ultra-fast switching speeds. An integrated Zener diode provides ESD protection.

FEATURES:

- Low capacitance – 0.3pF typical
- Low threshold – <1.5V max
- Fast switching – ton<1ns
- CMOS and TTL Compatible Input

APPLICATIONS:

- Active Pullups
- Video Switches
- Switch Drivers
- VHF/UHF Amplifiers

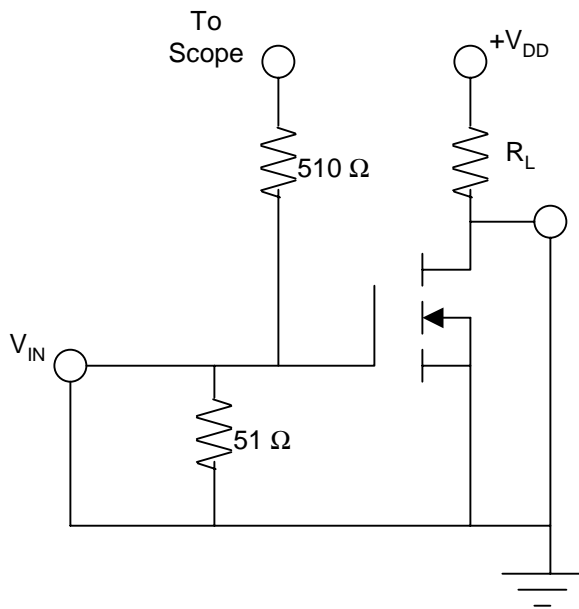


Electrical Specifications ($T_C = +25^\circ\text{C}$ unless otherwise noted)

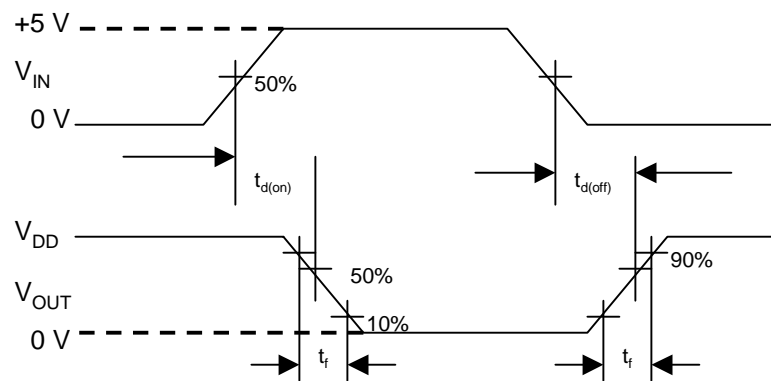
Parameter	Symbol	Test Conditions	SD400			SD403			Units			
			Min	Typ	Max	Min	Typ	Max				
STATIC	Drain-Source Breakdown Voltage	BV_{DS}	$I_D=1\ \mu\text{A}$ $V_{GS}=V_{BS}=0$		15	25		15	25		V	
	Source-Drain Breakdown Voltage	BV_{SD}	$I_S=10\ \text{nA}$ $V_{GD}=V_{BD}=-5$		15	20					V	
	Drain-Substrate Breakdown Voltage	BV_{DB}	$I_D=10\ \text{nA}$, $V_{GB}=0$ Source Open		10	15					V	
	Source-Substrate Breakdown Voltage	BV_{SB}	$I_D=10\ \mu\text{A}$, $V_{GB}=0$ Drain Open		15	20					V	
	Drain-Source Leakage	$I_{D(OFF)}$	$V_{GS/BS}=-5$ $V_{GS/BS}=0$	$V_{DS}=10\text{V}$		1	10					nA
				$V_{DS}=15\text{V}$					0.1	1		
	Source - Drain Leakage	$I_{S(OFF)}$	$V_{GD/BS}=-5$ $V_{GS/BS}=0$	$V_{DS}=10\text{V}$		1	10					nA
				$V_{DS}=15\text{V}$					0.1	1		
	Gate Leakage	I_{GBS}	$V_{DB/SB}=0$	$V_{GS}=20\text{V}$		1	10		1	10		μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=1\ \mu\text{A}$ $V_{SB}=0$		0.3	0.7	1.5	0.3	0.7	1.5		V	
Drain-Source ON Resistance	$r_{DS(ON)}$	$I_D=1\ \text{mA}$ $V_{SB}=0\text{V}$	$V_{GS}=2.4\text{V}$		140	175		140	175		Ohm	
			$V_{GS}=4.5\text{V}$		40	60		40	60		Ohm	

Parameter	Symbol	Test Conditions	SD400			SD403			Units		
			Min	Typ	Max	Min	Typ	Max			
DYNAMIC	Common-Source Forward Transconductance	g_{fs}	$V_{DS}=10\text{V}$ $I_D=20\text{mA}$ $f=1\text{MHz}$, $V_{SB}=0$ Pulsed		15	19		15	19		V
	Gate Node Capacitance	$C_{(gs+gd+gb)}$	$V_{DS}=10\text{V}$ $V_{GS}=V_{BS}=-15\text{V}$ $f=1\text{MHz}$		4.5	6.0		4.5	6.0		pF
	Drain Node Capacitance	$C_{(gd+db)}$			2.0	3.0		2.0	3.0		pF
	Source Node Capacitance	$C_{(gs+sb)}$			5.5	7.0		5.5	7.0		pF
	Reverse Transfer Capacitance	$C_{(dg)}$			0.3	0.5		0.3	0.5		pF
	Turn On Delay Time	$t_{d(on)}$	$V_{\infty}=10\text{V}$ $V_{G(on)}=10\text{V}$ $R_L=680\ \text{Ohms}$ $R_G=51\ \text{Ohms}$ $CL=1.5\text{pF}$		0.7	1.0		0.7	1.0		ns
	Rise Time	t_r			0.8	1.0		0.8	1.0		ns
Turn Off Delay Time	$T_{d(off)}$			1.5			1.5			ns	

Switching Time Test Circuit



Input Pulse: $t_d, t_r < 1\text{ns}$
 Pulse width: 100 ns
 Rep rate: 1 MHz
Sampling Scope
 $T_r < 360\text{ ps}$
 $R_{IN} = 1\text{ M Ohms}$
 $C_{IN} = 2\text{ pF}$
 $BW = 500\text{ MHz}$



Absolute Maximum Ratings, $T_c = +25^\circ\text{C}$

Parameter	Unit	Absolute Maximum ^[1]
		SOT-143
Drain-Source Voltage	V	+15
Gate-Source Voltage	V	-0.3 / +20
Gate-Drain Voltage	V	-0.3 / +20
Continuous Drain Current	mA	50
Power dissipation $T_c=25$	mW	300
Linear Derating Factor	mW/C	3
Junction Temperature	$^\circ\text{C}$	-55 to +125
Storage Temperature	$^\circ\text{C}$	-55 to +125

Notes:

1. Operation in excess of any one of these conditions may result in permanent damage to the device
2. $T_c = +25^\circ\text{C}$, where T_c is defined to be the temperature at the package pins where contact is made to the circuit board.

ESD WARNING: Handling Precautions Should Be Taken To Avoid Static Discharge.

Part Number Ordering Information

SOT – 143 Package	SD403SM	SD400SM
Sorted Chips By Carriers	SD403CP	SD400CP
Die In Wafer Form	SD403TW	SD400TW

www.CalmosTech.com

Data subject to change

Copyright © 2002 Calmos Technologies, Inc.