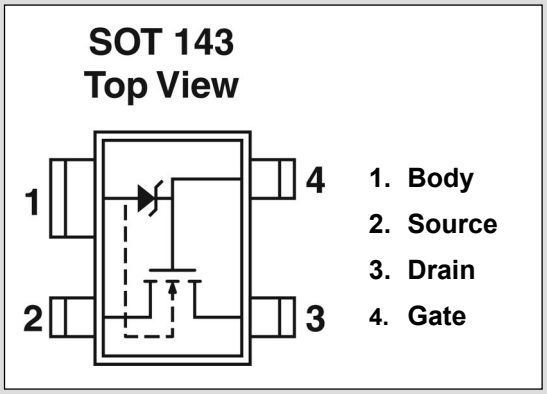
LINEAR SYSTEMS

Linear Integrated Systems

SST823 SST824

HIGH SPEED N-CHANNEL LATERAL DMOS SWITCH ZENER PROTECTED

FEATURES	
HIGH SWITCHING SPEED	t_{ON} = 2.0ns
LOW ON RESISTANCE	$r_{DS(ON)}$ = 5Ω
LOW GATE NODE CAPACITANCE	C = 25pF
LOW GATE LEAKAGE CAPACITANCE	$I_{G(ON)}$ = 0.05µA
ABSOLUTE MAXIMUM RATINGS[1] @ 25 °C (unless otherwise stated)	
Maximum Temperatures	
Storage Temperature	-55 to +150 °C
Operating Junction Temperature	-55 to +125 °C
Maximum Power Dissipation	
Continuous Power Dissipation[2]	P_D = 300mW
Maximum Currents	
Pulsed Drain Current[3]	I_{DS} = 1A
Continuous Drain Current[2]	I_{DS} = 200mA



Maximum Voltages							
V_{DSO}	Drain to Source		+25V		V_{SB}	Source to Body SST823	+22.5V
V_{SDO}	Source to Drain	SST823	+15V			SST824	+25V
		SST824	+20V		V_{GB}	Gate to Body	+30V
V_{DB}	Drain to Body	SST823	+22.5V		V_{GS}	Gate to Source	±22.5V
		SST824	+30V		V_{GD}	Gate to Drain	±22.5V

ELECTRICAL CHARACTERISTICS @ 25 °C (unless otherwise stated)

SYMBOL	CHARACTERISTIC		MIN	TYP	MAX	UNITS	CONDITIONS
BV_{DS}	Breakdown Voltage Drain to Source		25 15			V	I_D = 10µA, V_{GS} = V_{BS} = 0 I_D = 100nA, V_{GS} = V_{BS} = -5V
BV_{SD}	Breakdown Voltage Source to Drain	SST823 SST824	15 20			V	I_S = 100nA, V_{GD} = V_{BD} = -5V
BV_{DB}	Breakdown Voltage Drain to Body	SST823 SST824	22.5 25			V	I_D = 100nA, V_{GB} = 0, Source Open
BV_{SB}	Breakdown Voltage Source to Body	SST823 SST824	22.5 25			V	I_S = 100nA, V_{GB} = 0, Drain Open
$V_{GS(OFF)}$	Cutoff Voltage Gate to Source		0.1		2	V	V_{DS} = V_{GS}, V_{SB} = 0V, I_D = 10µA
$r_{DS(ON)}$	On Resistance Drain to Source[4]				7.5 5.0	Ω	V_{GS} = 5.0V, I_D = 50mA, V_{SB} = 0 V_{GS} = 10V, I_D = 500mA, V_{SB} = 0
g_{fs}	Forward Transconductance[4]		100	120		mmho	V_{DS} = 15V, I_D = 200mA
$I_{D(OFF)}$	Leakage Current Drain Node				100	nA	V_{GS} = V_{BS} = -5V, V_{DS} = 15V
$I_{S(OFF)}$	Leakage Current Source Node				100	nA	V_{GD} = V_{BD} = -5V, V_{DS} = 15V
$I_{G(OFF)}$	Leakage Current Gate Node (OFF)				100	nA	V_{GB} = 0V, V_{GS} = V_{GD} = -22.5V
$I_{G(ON)}$	Leakage Current Gate Node (ON)				10	µA	V_{GB} = 30V, V_{GS} = V_{GD} = 22.5V

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ELECTRICAL CHARACTERISTICS CONT.

SYMBOL	CHARACTERISTIC	MIN	TYP	MAX	UNITS	CONDITIONS
$C_{(GS+GD+GB)}$	Capacitance Gate Node		25	30	pF	V_{DS} = 10V, V_{GS} = V_{BS} = -15V, *f* = 1MHz
$C_{(GD+DB)}$	Capacitance Drain Node		13	15	pF	
$C_{(GS+SB)}$	Capacitance Source Node		35	40	pF	
C_{DG}	Capacitance Reverse Transfer		3	5	pF	
t_{ON}	Turn On Time[5]		2.0	3.0	ns	V_{DD} = 10V, $V_{G(ON)}$ = 10V,
t_{OFF}	Turn Off Time[5]		3.0	4.0	ns	R_L = 133Ω, R_G = 51Ω

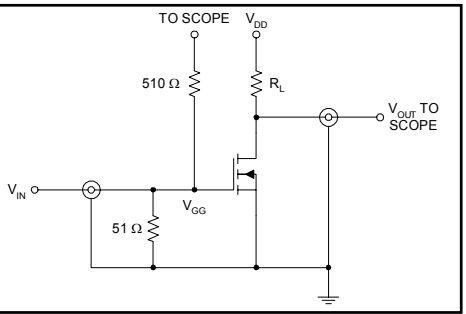
SWITCHING CHARACTERISTICS

V_{GG}	V_{DD}	R_L	$t_{d(ON)}$ TYP	t_r TYP	t_{OFF} TYP
5V	5V	100Ω	<1ns	1ns	3ns
	10V	200Ω	<1ns	1ns	3ns
	20V	300Ω	<1ns	1ns	3ns
10V	5V	67Ω	<1ns	1ns	3ns
	10V	133Ω	<1ns	1ns	3ns
	20V	270Ω	<1ns	1ns	3ns

TEST CIRCUIT

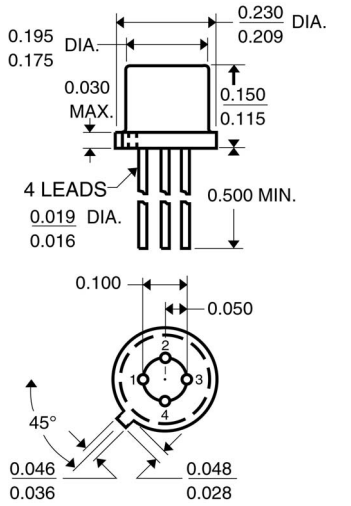
INPUT PULSE
td, tr < 1ns
Pulse Width = 10ns
Rep Rate = 1MHz

SAMPLING SCOPE
t_r < 360 ps
R_{IN} = 1MΩ
C_{IN} = 2.0pF

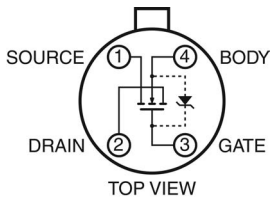


PACKAGE OPTION

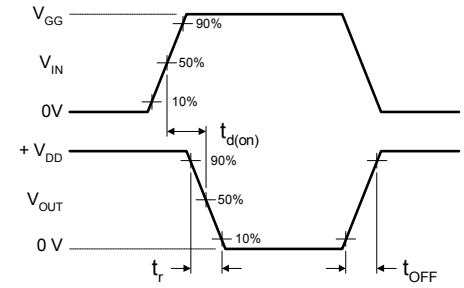
TO-72
Four Lead



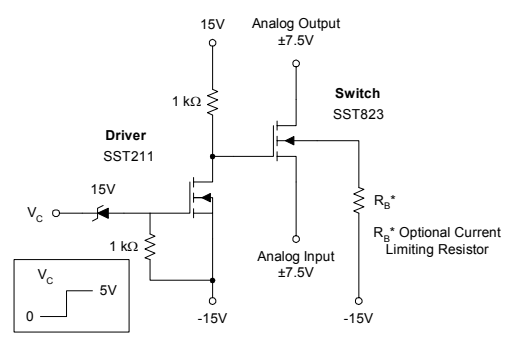
TO-72 PIN LAYOUT



SWITCHING WAVEFORMS



DRIVER / SWITCH APPLICATION



NOTES

1. Absolute maximum ratings are limiting values above which serviceability may be impaired.
2. For SOT143 package only.
3. Pulsed @ 80 µs, 1% duty cycle.
4. See test conditions in Electrical Characteristics section.
5. See Switching Characteristics and Test Circuit for detail.

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