SILICON GENERAL

LINEAR INTEGRATED CIRCUITS

SG55454B/SG55464/SG55474
SG75454B/SG75464/SG75474

DUAL PERIPHERAL POSITIVE-NOR DRIVER

DESCRIPTION

The SG55454B/SG55464/SG55474 (SG75454B/SG75464/SG75474) series of dual peripheral Positive-NOR drivers are a family of versatile devices designed for use in systems that employ TTL or DTL logic. This family of drivers are direct replacements for the Texas Instruments SN55454B/64/74 (SN75454B/64/74) series. Diode-clamped inputs simplify circuit design. Typical applications include high-speed logic buffers, power drivers, relay drivers, MOS drivers, line drivers, and memory drivers. The SG55454B/SG55464/SG55474 drivers are characterized for operation over the full military ambient temperature range of -55°C to 125°C and the SG75454B/SG75464/SG75474 drivers are characterized for operation from 0°C to 70°C.

FEATURES

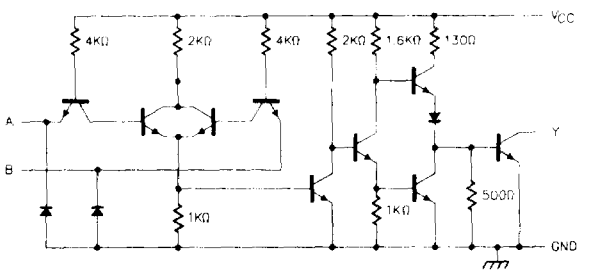
- **300mA output current capability**
- **High-voltage output**
- **No output latch-up at 20V**
- **High speed switching**
- **TTL or DTL compatible diode-clamped inputs**
- **Standard supply voltages**

HIGH RELIABILITY FEATURES

- SG55454B/SG55464/ SG55474

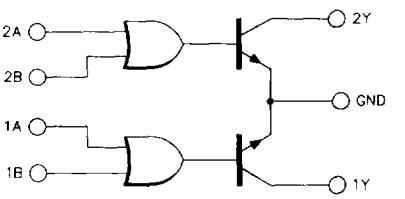
- **Available to MIL-STD-883**
- **Scheduled for MIL-M-38510 QPL listing**
- **SG level "S"processing available**

EQUIVALENT CIRCUIT SCHEMATIC (each driver)



BLOCK DIAGRAM

Positive Logic: $Y = \overline{A + B}$



FUNCTION TABLE (each gate)

A	B	Y
L	L	H (off-state)
L	H	L (on-state)
H	L	L (on-state)
H	H	L (on-state)

H = High Level, L = Low Level

6

January 1990

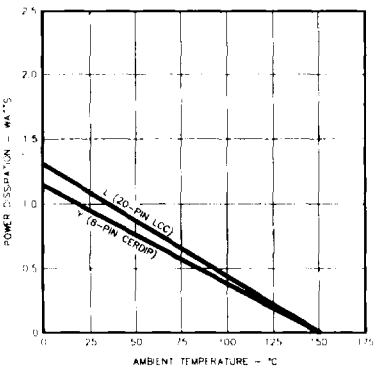
ABSOLUTE MAXIMUM RATINGS (Note 1)

Supply Voltage (V_{CC}) 7V
Input Voltage 5.5V
Interemitter Voltage 5.5V
Off-state Output Voltage
X5454B Series 30V
X5464 Series 35V
X5474 Series 70V

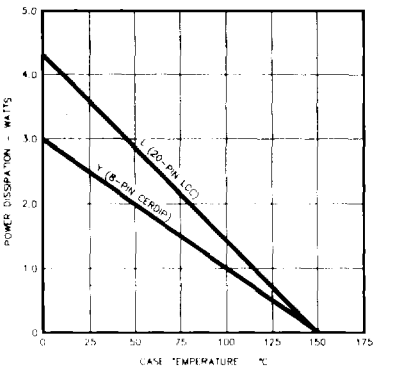
Output Current 400mA
Continuous Total Dissipation at (or below)
25°C Free-Air Temperature 800mW
Operating Junction Temperature
Hermetic (Y, L Packages) ..... 150°C
Storage Temperature Range ..... -65°C to 150°C
Lead Temperature (1/16 inch from case
for soldering 60 sec.) ..... 300°C

Note 1. Exceeding these ratings could cause damage to the device.

THERMAL DERATING CURVES



MAXIMUM POWER DISSIPATION vs AMBIENT TEMPERATURE



MAXIMUM POWER DISSIPATION vs CASE TEMPERATURE

RECOMMENDED OPERATING CONDITIONS (Notes 2 & 3)

Supply Voltage (V_{CC})
SG55454B, SG55464, SG55474 ..... 4.5V to 5.5V
SG75454B, SG75464, SG75474 ..... 4.75V to 5.25V

Operating Ambient Temperature Range
SG55454B, SG55464, SG55474 ..... -55°C to 125°C
SG75454B, SG75464, SG75474 ..... 0°C to 70°C

Note 2. Range over which device is functional.
Note 3. The substrate (pin 8) must always be at the most-negative device voltage for proper operation.

ELECTRICAL SPECIFICATIONS

(Unless otherwise specified, these specifications apply over the operating ambient temperatures for SG55454B/464/474 with -55°C ≤ T_A ≤ 125°C, and SG75454B/464/474 with 0°C ≤ T_A ≤ 70°C. Typical values are tested at V_{CC} = 5V, and T_A = 25°C. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

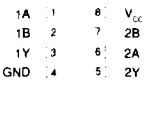
Parameter	Test Conditions	SG55454B SG55464 SG55474			SG75454B SG75464 SG75474			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
High-level Input Voltage (V_{IH})		**2**			**2**			**V**
Low-level Input Voltage (V_{IL})				0.8			0.8	V
Input Clamp Voltage (V_{IK})	**V_{CC} = MIN, I_{IN} = -12mA**		**-1.2**	**-1.5**		**-1.2**	**-1.5**	**V**
High-level Output Current (I_{OH})	V_{CC} = MIN, V_{IH} = 2V,			300			100	µA
	V_{OH} = 30V SGX5454B							
	V_{OH} = 35V SGX5464							
	V_{OH} = 70V SGX5474							
Low-level Output Voltage (V_{OL})	V_{CC} = MIN, V_{IL} = 0.8V, I_{OL} = 100mA		0.25	0.5		0.25	0.4	V
	V_{CC} = MIN, V_{IL} = 0.8V, I_{OL} = 300mA		**0.5**	**0.8**		**0.5**	**0.7**	**V**
Input Current at Max V_{IN} (I_{IN})	V_{CC} = MAX, V_{IN} = 5.5V			1.0			1.0	mA
High-level Input Current (I_{IH})	**V_{CC} = MAX, V_{IN} = 2.4V**			**40**			**40**	**µA**
Low-level Input Current (I_{IL})	V_{CC} = MAX, V_{IN} = 0.4V		-1.0	-1.6		-1.0	-1.6	mA
Supply Current, Outputs High	**V_{CC} = MAX, V_{IN} = 0V**							
	SGX5454B		13	17		13	17	mA
	SGX5464, SGX5474		**14**	**19**		**14**	**19**	**mA**
Supply Current, Outputs Low	V_{CC} = MAX, V_{IN} = 5V							
	SGX5454B		**61**	**79**		**61**	**79**	**mA**
	SGX5464, SGX5474		67	85		67	85	mA

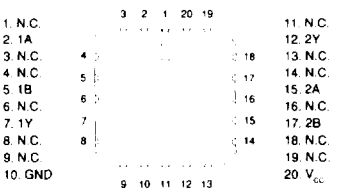
SWITCHING SPECIFICATIONS (V_{CC} = 5V, T_A = 25°C)

Parameter	Test Conditions	SG55454B SG75454B			SG55464 SG75464			SG55474 SG75474			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Propagation Delay Time, Low-to-High Level Output	I_C = 200mA, C_L = 15pF, $R_L \approx 50\Omega$		26	35		45	65		45	65	ns
Propagation Delay Time, High-to-Low Level Output			24	35		30	50		30	50	ns
Transition Time, Low-to-High Output			5	8		13	25		13	25	ns
Transition Time, High-to-Low Level Output			7	12		10	20		10	20	ns
High-Level Output Voltage After Switching	**I_C = 300mA,** V_S = 20V SGX5454B	V_S-6.5									mV
	V_S = 30V SGX5464				V_S-10						**mV**
	V_S = 55V SGX5474							V_S-18			mV

CONNECTION DIAGRAMS & ORDERING INFORMATION (See Notes Below)

Package	Part No.	Ambient Temperature Range
8-PIN CERAMIC DIP Y - PACKAGE	SG55454BY/883B	-55°C to 125°C
	SG55454BY	-55°C to 125°C
	SG55464Y/883B	-55°C to 125°C
	SG55464Y	-55°C to 125°C
	SG55474Y/883B	-55°C to 125°C
	SG55474Y	-55°C to 125°C
	SG75454BY	0°C to 70°C
	SG75464Y	0°C to 70°C
	SG75474Y	0°C to 70°C
20-PIN CERAMIC LEADLESS CHIP CARRIER L- PACKAGE	SG55454BL/883B	-55°C to 125°C
	SG55454BL	-55°C to 125°C
	SG55464L/883B	-55°C to 125°C
	SG55464L	-55°C to 125°C
	SG55474L/883B	-55°C to 125°C
	SG55474L	-55°C to 125°C





Note 1. Contact factory for JAN and DESC product availability.
2. All parts are viewed from the top.
3. Product is also available in flat pack. Consult factory for price and delivery.