LINFINITY
MICROELECTRONICS

SG5768, SG5770, SG5772, SG5774
SG6506/SG6507/SG6508/SG6509

DIODE ARRAY CIRCUITS

DESCRIPTION

The Linfinity series of diode arrays feature high breakdown, high speed diodes in a variety of configurations.

Each array configuration consists of either common anode diodes, common cathode diodes, or a combination of common anode and common cathode diodes.

Individual diodes within the array have 60V minimum breakdown voltage, can handle 500mA of current and typically switch in less than 10 nanoseconds.

Each of the array configurations is available in ceramic DIP or ceramic flatpack and can be processed to JANTXV, JANTX, or JAN flows at Linfinity's MIL-S-19500 facility.

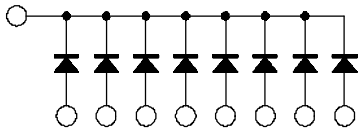
FEATURES

- **60V minimum breakdown voltage**
- **500mA current capability per diode**
- **Fast switching speeds: typically less than 10ns**
- **Low leakage current**

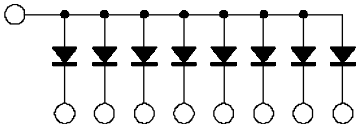
HIGH RELIABILITY FEATURES

- ♦ **MIL-S-19500/474 QPL - 1N5768 - 1N6506**
  - 1N5770 - 1N6507
  - 1N5772 - 1N6508
  - 1N5774 - 1N6509
- ♦ **JANTXV, JANTX & JAN available**
- ♦ **LMI level "S" processing available**

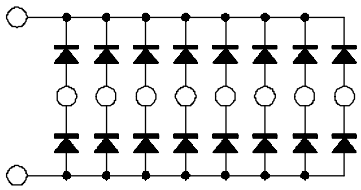
CIRCUIT DIAGRAMS



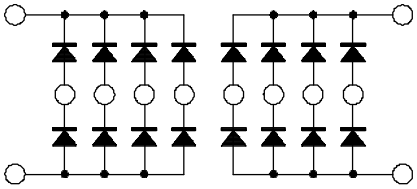
COMMON CATHODE
SG5768/SG6506



COMMON ANODE
SG5770/SG6507



COMMON ANODE / COMMON CATHODE
SG5772/SG6508



DUAL COMMON ANODE / COMMON CATHODE
SG5774/SG6509

LINFINITY Microelectronics Inc.
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ABSOLUTE MAXIMUM RATINGS (Note 1 & 2)

Breakdown Voltage (V_{BR}) 60V
Output Current (I_O), T_C = 25°C
Continuous 500mA

Operating Junction Temperature
Hermetic (J, F Packages) ..... 150°C
Storage Temperature Range ..... -65°C to 200°C

Note 1. Exceeding these ratings could cause damage to the device.
Note 2. Applicable for each diode.

THERMAL DATA

J Package:
Thermal Resistance-Junction to Case, θ_{JC} ..... 30°C/W
Thermal Resistance-Junction to Ambient, θ_{JA} ..... 80°C/W
F Package (10 Pin):
Thermal Resistance-Junction to Case, θ_{JC} ..... 80°C/W
Thermal Resistance-Junction to Ambient, θ_{JA} ..... 145°C/W
F Package (14 Pin):
Thermal Resistance-Junction to Case, θ_{JC} ..... 80°C/W
Thermal Resistance-Junction to Ambient, θ_{JA} ..... 140°C/W

Note A. Junction Temperature Calculation: $T_J = T_A + (P_D \times \theta_{JA})$.
Note B. The above numbers for θ_{JC} are maximums for the limiting thermal resistance of the package in a standard mounting configuration. The θ_{JA} numbers are meant to be guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

RECOMMENDED OPERATING CONDITIONS (Note 3)

Operating Ambient Temperature Range
SG5768 ..... -55°C to 150°C
SG5770 ..... -55°C to 150°C
SG5772 ..... -55°C to 150°C

Operating Ambient Temperature Range
SG5774 ..... -55°C to 150°C
SG6506 ..... -55°C to 150°C
SG6507 ..... -55°C to 150°C
SG6508 ..... -55°C to 150°C
SG6509 ..... -55°C to 150°C

Note 3. Range over which the device is functional.

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, these specifications apply for the operating temperature of T_A = 25°C for each diode. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

Parameter	Test Conditions	SG5768/SG6506			Units
		Min.	Typ.	Max.	
Breakdown Voltage (V_{BR})	I_R = 10µA	60			V
Forward Voltage (V_F)	Duty Cycle ≤ 2%, 300 µs pulse				
	I_F = 100mA			1.0	V
	I_F = 200mA			1.1	V
	I_F = 500mA			1.5	V
	I_F = 10mA, T_A = -55°C			1.0	V
Reverse Current (I_R)	V_R = 40V			100	nA
	V_R = 40V, T_A = 150°C			50	µA
Capacitance (C) (Note 4)	V_R = 0V, f = 1MHz, Pin-to-pin			4	pf
Forward Recovery Time (t_{fr})					
(Note 4)	I_F = 500mA, t_r ≤ 15ns, V_{fr} = 1.8V, R_S = 50Ω			40	ns
Reverse Recovery Time (t_{rr})					
(Note 4)	I_F = I_R = 200mA, i_{rr} = 20mA, R_L = 100Ω			20	

Note 4. The parameters, although guaranteed, are not 100% tested in production.

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ELECTRICAL CHARACTERISTICS (continued)

Parameter	Test Conditions	SG5770/SG6507			Units
		Min.	Typ.	Max.	
Breakdown Voltage (V_{BR})	I_R = 10µA, 100ms pulse, ≤ 20% Duty Cycle	60			V
Forward Voltage (V_F)	Duty Cycle ≤ 2%, 300 µs pulse				
	I_F = 100mA			1.0	V
	I_F = 200mA			1.1	V
	I_F = 500mA			1.5	V
	I_F = 10mA, T_A = -55°C			1.0	V
Reverse Current (I_R)	V_R = 40V			100	nA
	V_R = 40V, T_A = 150°C			50	µA
Capacitance (C) (Note 4)	V_R = 0V, f = 1MHz, Pin-to-pin			8	pf
Forward Recovery Time (t_{fr})					
(Note 4)	I_F = 500mA, t_r ≤ 15ns, V_{fr} = 1.8V, R_S = 50Ω			40	ns
Reverse Recovery Time (t_{rr})					
(Note 4)	I_F = I_R = 200mA, i_{rr} = 20mA, R_L = 100Ω		7	20	ns

Parameter	Test Conditions	SG5772/SG6508 SG5774/SG6509			Units
		Min.	Typ.	Max.	
Breakdown Voltage (V_{BR})	I_R = 10µA, 100ms pulse, ≤ 20% Duty Cycle	60			V
Forward Voltage (V_F)	Duty Cycle ≤ 2%, 300µs pulse				
	I_F = 100mA			1.0	V
	I_F = 200mA			1.1	V
	I_F = 500mA			1.5	V
	I_F = 10mA, T_A = -55°C			1.0	V
Reverse Current (I_R)	V_R = 40V			100	nA
	V_R = 40V, T_A = 150°C			50	µA
Capacitance (C) (Note 4)	V_R = 0V, f = 1MHz, Pin-to-pin			8	pf
Forward Recovery Time (t_{fr})					
(Note 4)	I_F = 500mA, t_r ≤ 15ns, V_{fr} = 1.8V, R_S = 50Ω			40	ns
Reverse Recovery Time (t_{rr})					
(Note 4)			7	20	ns

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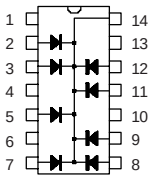
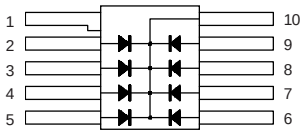
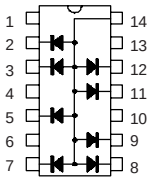
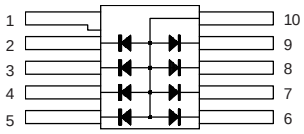
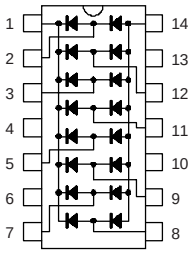
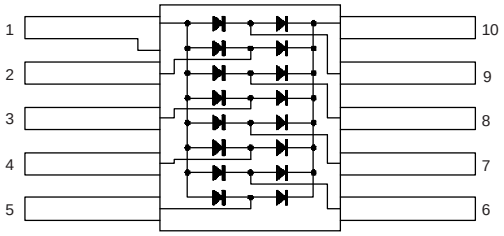
CONNECTION DIAGRAMS & ORDERING INFORMATION (See Notes Below)

Package	Part No.	Ambient Temperature Range	Connection Diagram
14-PIN CERAMIC DIP J - PACKAGE	SG6506J (1N6506)	-55°C to 150°C -55°C to 150°C	
10-PIN CERAMIC FLATPACK F - PACKAGE	SG5768F (1N5768)	-55°C to 150°C -55°C to 150°C	
14-PIN CERAMIC DIP J - PACKAGE	SG6507J (1N6507)	-55°C to 150°C -55°C to 150°C	
10-PIN CERAMIC FLATPACK F - PACKAGE	SG5770F (1N5770)	-55°C to 150°C -55°C to 150°C	
14-PIN CERAMIC DIP J - PACKAGE	SG6508J (1N6508)	-55°C to 150°C -55°C to 150°C	
10-PIN CERAMIC FLATPACK F - PACKAGE	SG5772F (1N5772)	-55°C to 150°C -55°C to 150°C	

Note 1. Consult factory for other packages available.
2. All packages are viewed from the top.
3. Consult factory for JAN, JAN TX, and JAN TXV product availability.

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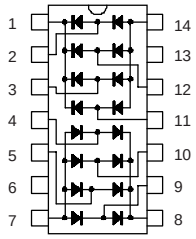
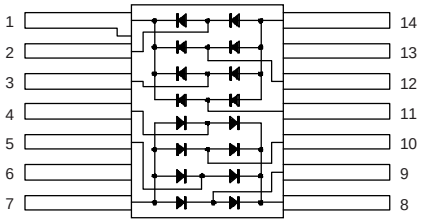
CONNECTION DIAGRAMS & ORDERING INFORMATION (continued)

Package	Part No.	Ambient Temperature Range	Connection Diagram
14-PIN CERAMIC DIP J - PACKAGE	SG6509J (1N6509)	-55°C to 150°C -55°C to 150°C	
14-PIN CERAMIC FLATPACK F - PACKAGE	SG5774F (1N5774)	-55°C to 150°C -55°C to 150°C	

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