T-07-15

LIMITER DIODES

DESCRIPTION

The GC4700 series diodes are specially processed PIN diodes designed for use in passive or active limiters at frequencies through Ku band.

Five categories of devices are offered for flexibility in design of low (lower VB, fastest turn-on time), medium and high (highest V_B, slowest turn-on time) power limiters.

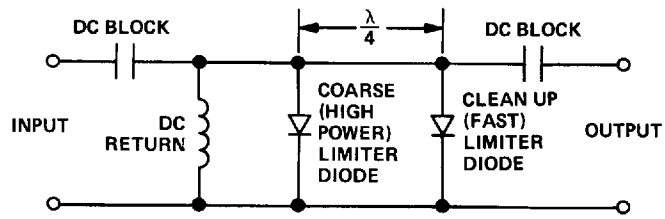
APPLICATIONS

A diode limiter is a power-sensitive variable attenuator that uses the non-linear properties of the diode to provide an impedance mismatch when sufficient amounts of RF power are incident on the device. The output power is reduced to a level that will not overdrive a receiver, burn out a mixer, etc. For varying input power levels in excess of the diode's threshold level, the limiter's output power tends to remain constant.

A passive limiter is one in which the limiter diodes are "turned on" by the RF signal itself. An active limiter is one in which the limiter diodes are "turned on" primarily by an external bias current typically supplied by a Schottky detector diode which senses the incident signal.

Since limiter diodes are not designed to dissipate large amounts of power, the limiter must reflect or divert the excess incident power back to the source or to another load (i.e. via a circulator, hybrid coupler, etc.).

Limiter diodes may be used in waveguides, coax, microstrip, stripline or other media. Single or cascaded devices may be used, depending on power levels.



BASIC TWO-DIODE LIMITER

CHIP ELECTRICAL PARAMETERS

$T_A = 25°C$

MODEL NUMBER	Vb MIN (VOLTS)	Cjo TYP (pF)	Cj6 MAX (pF)	TYPICAL Rs @10 mA (ohms)	TYPICAL T_L (ns)	TYPICAL θP (°C/W)	MAXIMUM THERMAL RESISTANCE (°C/W)
GC4701	20	0.20	0.15	1.5	5	20	100
GC4702		0.50	0.30	1.2	10	12	80
GC4711	45	0.20	0.15	1.5	10	15	80
GC4712		0.50	0.30	1.2	15	10	60
GC4713		0.70	0.50	1.0	20	6	40
GC4721	120	0.20	0.15	1.5	50	12	40
GC4722		0.60	0.30	1.0	50	0.5	20
GC4723		0.80	0.50	0.5	100	0.3	15
GC4731	15	0.12	0.10	2.0	5	30	120
GC4732		0.20	0.15	1.5	5	20	80
GC4741	30	0.12	0.10	2.0	7	20	100
GC4742		0.20C	0.15	1.5	7	15	70

CONTROL DEVICES

LIMITER DIODES

TYPICAL LIMITER PERFORMANCE RATINGS

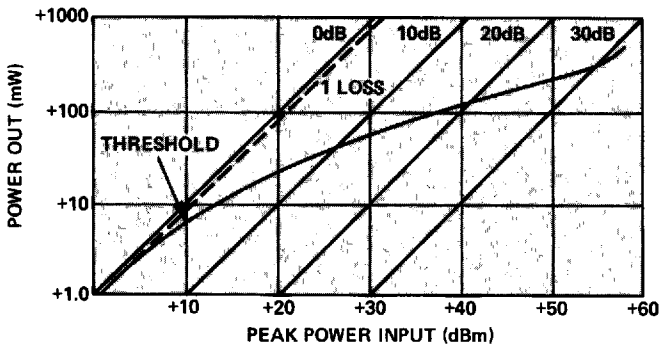
$T_A = 25°C$

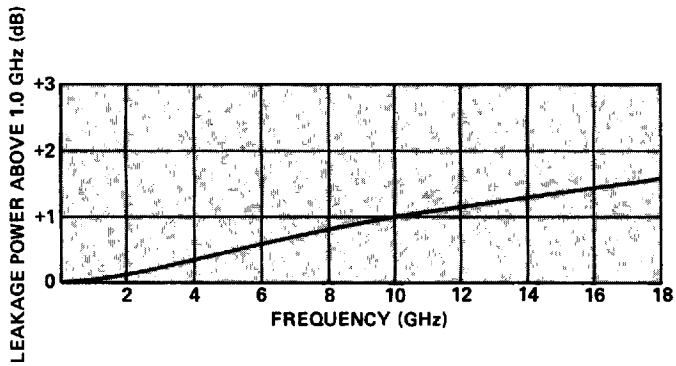
MODEL NUMBER	MAXIMUM PEAK Pin @1.μS (dBm)	TYPICAL LEAKAGE P_{out} (dBm)	TYPICAL THRESHOLD (dBm)	TYPICAL INSERTION LOSS (dB)	MAXIMUM CW POWER (watts)
GC4701	+50	+22	+10	1.0	2
GC4702	+53	+24	+10	0.2	3
GC4711	+53	+27	+15	1.0	3
GC4712	+56	+29	+15	0.2	4
GC4713	+59	+31	+15	0.2	5
GC4721	+60	+39	+20	1.0	5
GC4722	+63	+41	+20	0.2	10
GC4723	+66	+44	+20	0.2	15
GC4731	+47	+19	+7	0.1	2
GC4732	+50	+22	+7	0.1	3
GC4741	+47	+24	+12	0.1	3
GC4742	+50	+27	+12	0.1	4

NOTES:

1. AVAILABLE IN STANDARD CASE STYLES 30, 35, 42 AND 45. WHEN ORDERING SPECIFY THE DESIRED CASE STYLE BY ADDING ITS NUMBER AS A SUFFIX TO THE BASIC PART NUMBER. SOME OTHER CASE STYLES ARE AVAILABLE ON REQUEST.

TYPICAL PERFORMANCE





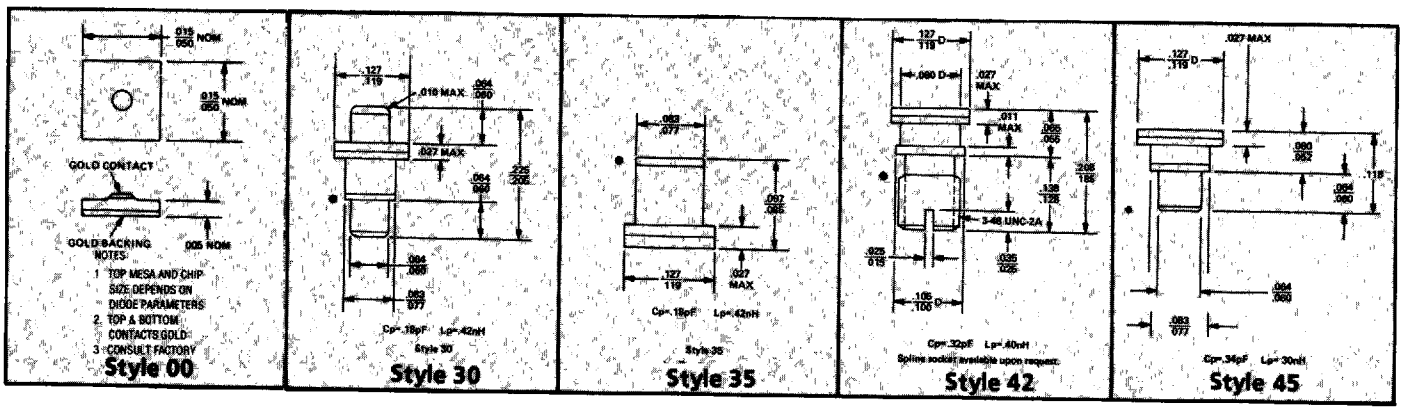
RATING

Maximum Leakage Current: 0.5mA at 80% of minimum rated breakdown

Operating Temperature: -55°C to +150°C

LIMITER DIODES

PACKAGE STYLES



(•) Heat sink end. Dimensions are in inches.

Other Package Styles Are Available on Request.

The Cathode is the heat sink end of each package. Reverse polarity is available at a slightly higher cost.