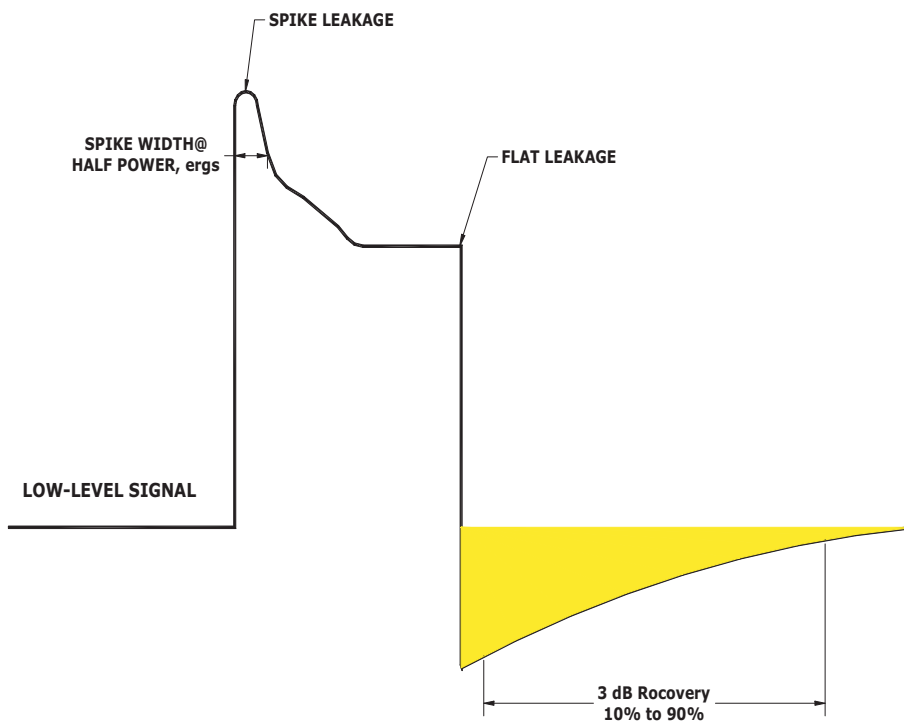




*limiter application
notes*

eclipse microwave, inc offers two basic limiter designs, EPL Series and ESL Series. These Limiters are passive and broadband devices mainly used for receiver protection, input limiting, and leveling circuit to eliminate high RF spike levels. The limiters are constructed in hermetic modules. Flat rectangular modules are used in stripline applications while the cylindrical version accommodates SMA coaxial connectors. Other RF coaxial connectors are available as specials.

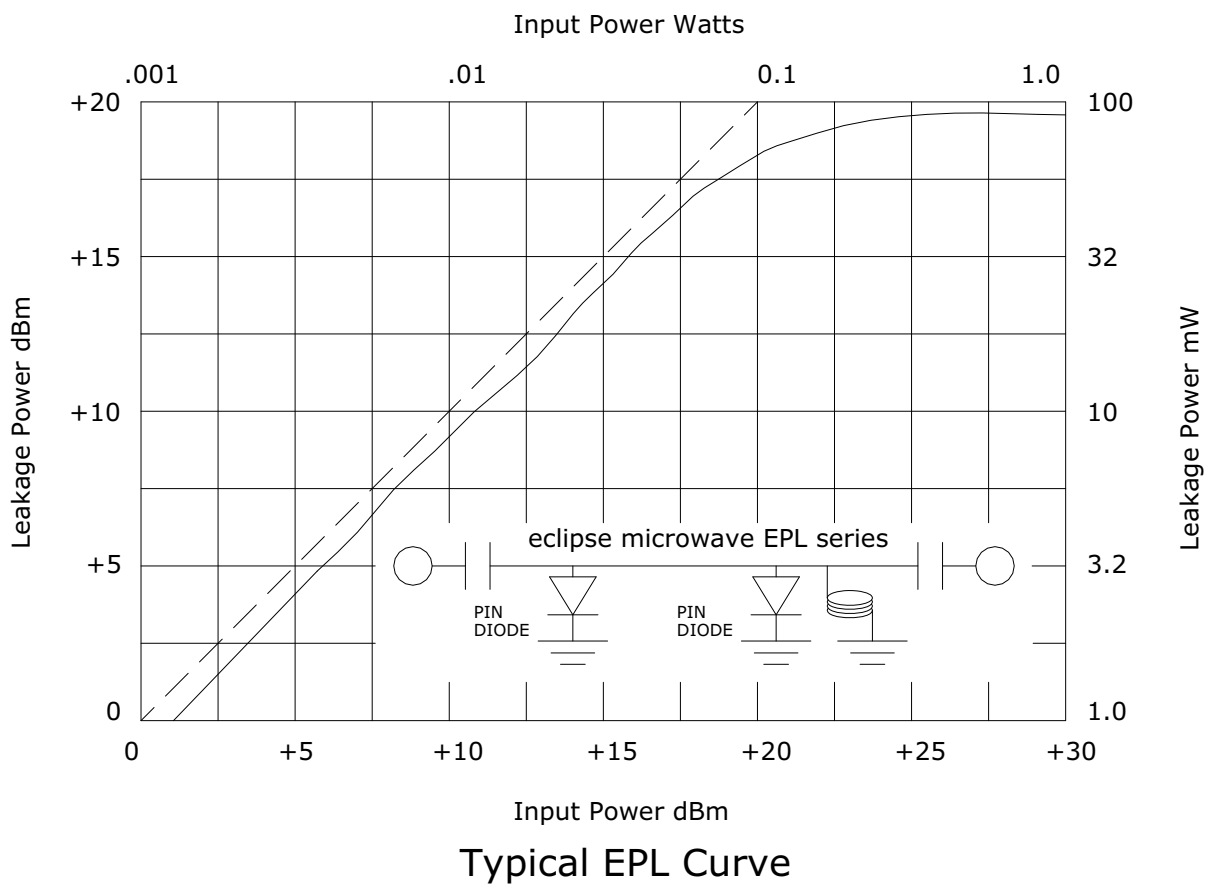
Limiter applications include protection of tunnel diode amplifiers, transistors and GaAs FET amplifiers, mixers, and detectors in ECM, communication, and radar equipment. A limiter at the input of an amplifier can keep the amplifier from being driven into overdrive. Thus, the unwanted harmonics and slow recovery times are eliminated.



TYPICAL LIMITER PULSE CHARACTERISTICS

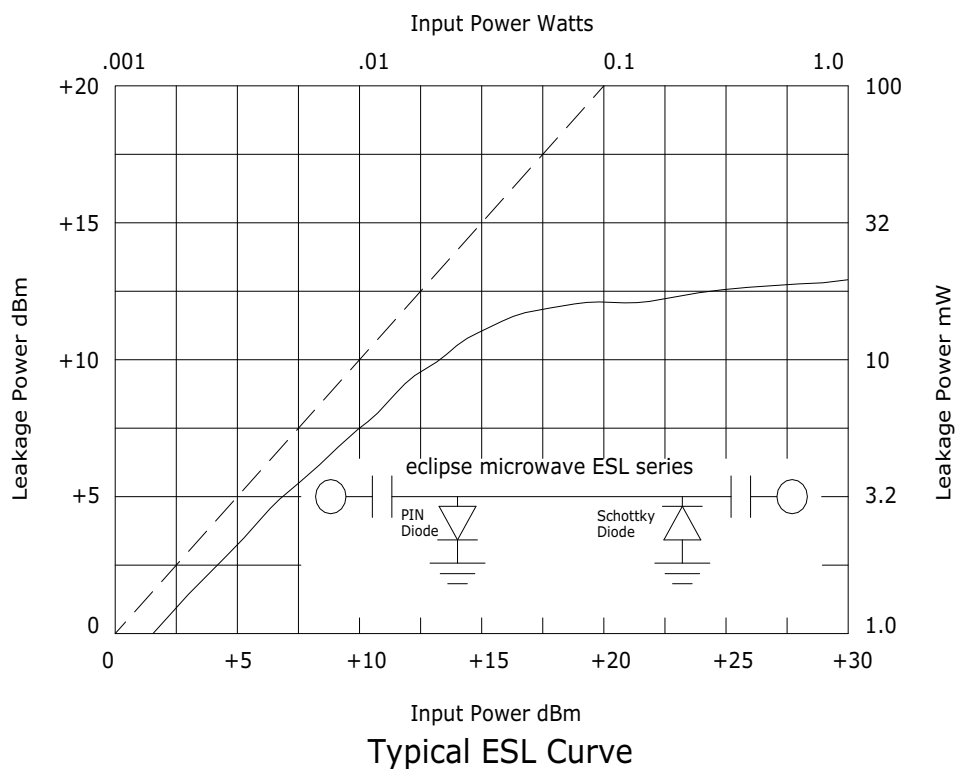
The EPL Series Limiters utilize a 2-micron, gold-doped I-layer PIN limiter chips. They are assembled in a low pass filter network. The chips are spaced close to a quarter wave length apart near the high end of the frequency range. These PIN diode limiters require a DC return for proper operation. This may be supplied with internal DC return when the lower frequency is 1 GHz or higher and no more than a decade wide.

The power handling of a PIN diode limiter is 1 watt CW and pulses up to 100 watts peak with a 1 μ sec pulse width and 0.1% duty cycle.



The ESL Series Limiters use a higher power 8 to 12 micron I-layer standard PIN diode chips. The limiter is detector driven from an opposite polarity Schottky chip. These limiters are capable for higher power handling and approximately 6 dB lower spike leakage than the EPL series limiters. The ESL series limiters require DC blocks at the input and output. These DC blocks keep the Schottky current flowing through the PIN diodes and away from external resistive loads or stubs which form DC short to ground.

The ESL series limiters are capable to handle powers of 3 to 5 watts CW and 200 to 300 watts peak for 2.5 μ sec pulse width and 1% duty cycle. These higher power limiters have faster turn-on time but recovery time can be as long as 1/2 μ sec.



The parameters are quite similar for both types of limiters, except for the limiting threshold, which the insertion loss increases by one dB and the limiting begins. Limiting threshold is typically +7 dBm. The insertion loss of limiter is measured at -10 dBm.

Maximum leakage is specified at 1 watt CW input (+30 dBm). The peak power flat leakage is approximately the same level as the 1W CW leakage. When the input to the limiter is a high power pulse, there is a very narrow spike of a few nsec about 6 dB above the flat leakage for ESL Series.