

### SURFACE MOUNT ATTENUATING SILICON PIN DIODES

#### Features

- Large dynamic range
- Low harmonic distortion
- High minority carrier lifetime
- Surface mount package
- Tape and reel packaging available

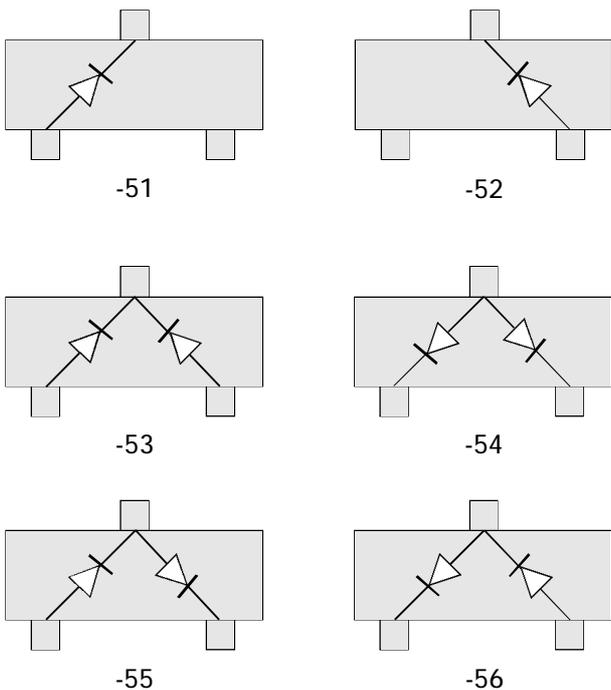
#### Description

TEKELEC TEMEX uses its proprietary technology to manufacture its Silicon chips in **SOT23**.

This products family is designed for a low cost medium to high volume market that may be supplied in tape and reel for automated pick and place assembly on surface mount circuit boards.

The use of this technology eliminates wire bonding directly on to the chips.

#### Outline drawing



(Top view)

Nota: Other plastic packages available.

#### Applications

Typical applications include variable RF attenuators and AGC (Automatic Gain Control) circuits, from MHz to several GHz. The attenuating PIN diode uses properties of variation of forward series resistance versus the DC forward bias current. In order to obtain the best dynamic range, a single diode attenuator may be used in series or shunt configuration or designed as a multiple diode circuit (T or  $\pi$  circuit), where the device may be matched through the attenuation range.

**Note:** To reduce the distortion, it is necessary to verify and design with the following formula:

$$\frac{\hat{I}_{HF}}{\pi \tau_I I_{DC} F} \ll 1$$

- $\hat{I}_{HF}$  : RF peak current (A)
- $\tau_I$  : Diode minority carrier lifetime(s)
- $I_{DC}$  : DC bias current (A)
- F : Application frequency (Hz)



**Electrical characteristics at 25° C**

Electrical Parameters	I Zone thickness (1)	Series Resistance						Junction capacitance $C_j$ (2)		Reverse current $I_R$	Carrier lifetime $\tau_i$
Test conditions	$\mu\text{m}$	F = 120 MHz						F = 1 MHz		$V_R = 100\text{ V}$	$I_F = 10\text{ mA}$ $I_R = 6\text{ mA}$
Type (3)	typ.	$I_F = 0.1\text{ mA}$		$I_F = 1\text{ mA}$		$I_F = 10\text{ mA}$		pF		$\mu\text{A}$	$\mu\text{s}$
		min	max	min	max	min	max	typ.	max	max	typ.
DH40141-XX	140	400	800	50	100	6.5	13.0	0.05	0.10	10	2.5
DH40144-XX	140	200	400	25	50	3.5	7.0	0.10	0.30	10	5
DH40225-XX(4)	220	400	800	50	100	6.5	13.0	0.10	0.30	10	7

- (1) Other I zone thicknesses on request
- (2) Other capacitance values on request
- (3) -XX digits for internal electrical configuration
- (4) New products, please call your local sales offices.

**Temperature ranges:**

Operating junction ( $T_j$ ) : - 55° C to + 150° C  
 Storage : - 65° C to + 150° C

**Typical performance curve**

