Features

- Low Distortion Harmonics, -85 dBC
- Broadband Performance, >10 GHz
- Low Insertion Loss
- High Attenuation, 27 dB
- RoHS* Compliant

Description

MSAT-N25 is a broadband, high linearity, medium power shunt NIP attenuator packaged in a 1.9 x 1.1 mm DFN package. This device is designed for wireless telecommunication infrastructure and test instrument applications and it is also suited for other applications in 0.1 ~ 10 GHz range.

Electrical Specifications: $T_A = +25^\circ \text{C}$

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Units</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakdown Voltage ($V_{BR}$)</td>
<td>$I_R = 10 , \mu\text{A}$</td>
<td>V</td>
<td>200</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Lifetime ($T_I$)</td>
<td>$I_F = 10 , \text{mA}$, $I_R = 6 , \text{mA}$, 10% / 90%</td>
<td>ns</td>
<td>2000</td>
<td>3000</td>
<td>5000</td>
</tr>
<tr>
<td>Minimum Series Resistance ($R_S$)</td>
<td>$I = 100 , \text{mA}$, 500 MHz</td>
<td>$\Omega$</td>
<td>—</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>High Series Resistance ($R_S$)</td>
<td>$I = 10 , \mu\text{A}$, 500 MHz</td>
<td>$\Omega$</td>
<td>2000</td>
<td>3000</td>
<td>4000</td>
</tr>
<tr>
<td>Low Series Resistance ($R_S$)</td>
<td>$I = 1 , \text{mA}$, 500 MHz</td>
<td>$\Omega$</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Attenuation</td>
<td>$I = 100 , \text{mA}$, ≤10 GHz</td>
<td>dB</td>
<td>20</td>
<td>25</td>
<td>—</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Absolute Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current ($I_F$)</td>
<td>200 mA</td>
</tr>
<tr>
<td>Reverse Voltage ($V_{RS}$)</td>
<td>200 V</td>
</tr>
<tr>
<td>Thermal Resistance ($\theta_{JC}$)</td>
<td>$+20^\circ\text{C/W}$</td>
</tr>
<tr>
<td>Junction Temperature ($T_J$)</td>
<td>$+175^\circ\text{C}$</td>
</tr>
<tr>
<td>Storage Temperature ($T_{STG}$)</td>
<td>$-65^\circ\text{C to } +125^\circ\text{C}$</td>
</tr>
<tr>
<td>Assembly Temperature ($T_{SOLDER}$)</td>
<td>$+260^\circ\text{C}$</td>
</tr>
</tbody>
</table>

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.
Performance Curves

**Attenuation vs. Current**

```
Frequency (GHz)  0  2  4  6  8  10
S21 (dB)        -30 -25 -20 -15 -10 -5
10 μA           
20 μA           
40 μA           
100 μA          
200 μA          
400 μA          
1 mA            
2 mA            
4 mA            
10 mA           
20 mA           
40 mA           
100 mA          
```

**Resistance vs. Current**

```
Current (mA)  0.01 0.1 1 10 100
Resistance (ohms) 10000 1000 100 10
```

For further information and support please visit: [https://www.macom.com/support](https://www.macom.com/support)
Recommended PCB Layout$^{1,2}$

1. If possible, use copper filled vias underneath pin 3 for better thermal performance; otherwise, use vias that are plated through, filled and plated over.
2. Solder mask should provide a 60 µm clearance between copper pad and solder mask. Rounded package pads should have matching rounded solder mask openings.
Dimensions do not include mold flashing.
Burrs and dumbar shall not exceed 0.002” per surface.
Lead co-planarity is 0.003” maximum.
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