

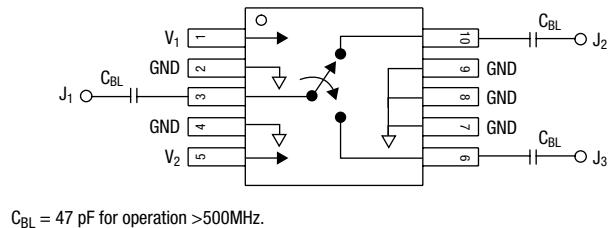
**DATA SHEET**

# AS177-86, AS177-86LF: GaAs IC High-Isolation Positive Control SPDT Switch 300 kHz–3.0 GHz

**Features**

- Positive voltage control (0/3, 5 V)
- High isolation (50 dB @ 0.9, 1.9 GHz)
- Low DC power consumption
- Ideal for GSM, PCS, 3G and ISM 2.4 GHz applications
- Miniature low-cost MSOP-10 plastic package
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

**Pin Out**



**Description**

The AS177-86 is a GaAs FET IC SPDT switch packaged in an MSOP-10 plastic package for low-cost, high-isolation commercial applications. It is an ideal building block for base station dual-band applications where synthesizer isolation is critical. Use in conjunction with the AS165-59 SPST switch to meet GSM synthesizer isolation requirements.

**NEW** Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.



**Electrical Specifications at 25 °C (0, 3 V), (0, 5 V)**

Parameter <sup>(1)</sup>	Condition	Frequency	Min.	Typ.	Max.	Unit
Insertion loss <sup>(2)</sup>		300 kHz–1.0 GHz		0.7	0.85	dB
		1.0–2.0 GHz		0.8	1	dB
		2.0–3.0 GHz		0.9	1.2	dB
Isolation	J <sub>1</sub> –J <sub>2</sub> /J <sub>1</sub> –J <sub>3</sub> J <sub>1</sub> –J <sub>2</sub> /J <sub>1</sub> –J <sub>3</sub>	300 kHz–2.0 GHz	44/50	48/55		dB
		2.0–2.5 GHz	41/44	46/50		dB
		2.5–3.0 GHz	34	40		
VSWR <sup>(3)</sup>		300 kHz–3.0 GHz		1.3:1	1.5:1	

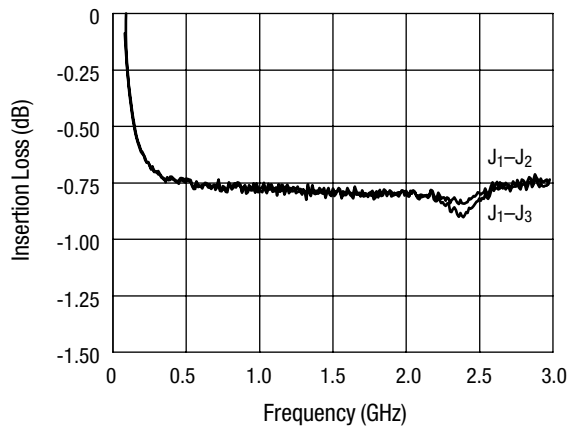
1. All measurements made in a 50 Ω system, unless otherwise specified.  
 2. Insertion loss changes by 0.003 dB/°C.  
 3. Insertion loss state.

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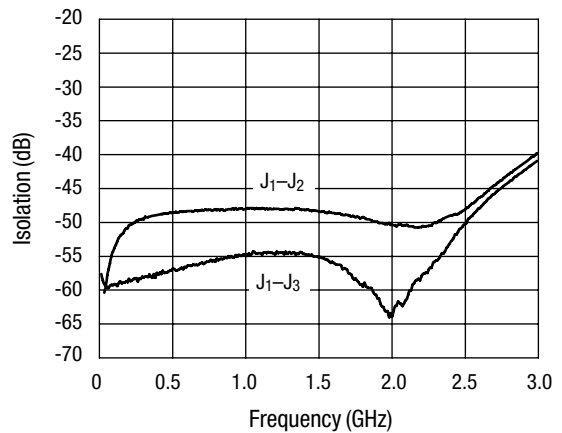
### Operating Characteristics at 25 °C (0, 5 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics						
Rise, fall	10/90% or 90/10% RF			50		ns
On, off	50% CTL to 90/10% RF			100		ns
Video feedthru	$T_{RISE} = 1 \text{ ns}$ , BW = 500 MHz			25		mV
Input power for 1 dB compression	$V_{CTL} = 3 \text{ V}$ $V_{CTL} = 5 \text{ V}$	0.5–3.0 GHz 0.5–3.0 GHz		21 27		dB dB
Intermodulation intercept point (IP3)	Two-tone input power 5 dBm $V_{CTL} = 3 \text{ V}$ $V_{CTL} = 5 \text{ V}$	0.5–3.0 GHz 0.5–3.0 GHz		41 45		dBm dBm
Thermal resistance				25		°C/W
Control voltages	$V_{LOW} = 0 \text{ to } 0.2 \text{ V @ } 20 \text{ } \mu\text{A max.}$ $V_{HIGH} = 3 \text{ V @ } 100 \text{ } \mu\text{A max. to } 5 \text{ V @ } 200 \text{ } \mu\text{A max.}$					

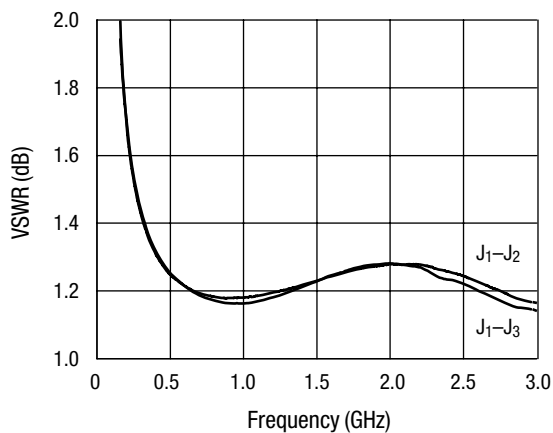
### Typical Performance Data (0, 5 V)



**Insertion Loss vs. Frequency**



**Isolation vs. Frequency**



**VSWR vs. Frequency**

**Truth Table**

V <sub>1</sub>	V <sub>2</sub>	J <sub>1</sub> -J <sub>2</sub>	J <sub>1</sub> -J <sub>3</sub>
0	V <sub>HIGH</sub>	Isolation	Insertion loss
V <sub>HIGH</sub>	0	Insertion loss	Isolation

All other conditions not recommended.  
V<sub>HIGH</sub> = 3 V to 5 V.

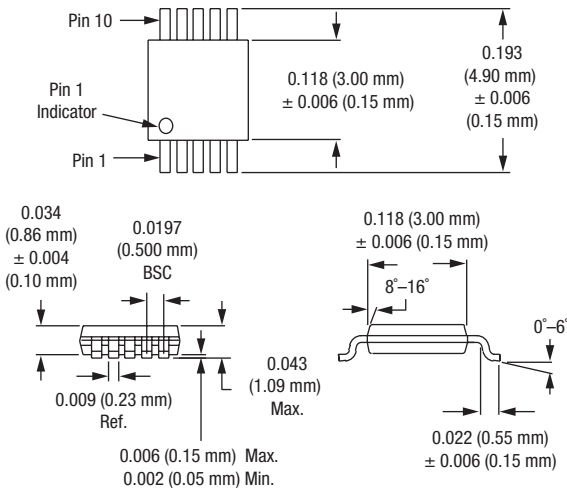
**Recommended Solder Reflow Profiles**

Refer to the [“Recommended Solder Reflow Profile”](#) Application Note.

**Tape and Reel Information**

Refer to the [“Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation”](#) Application Note.

**MSOP-10**



**Absolute Maximum Ratings**

Characteristic	Value
RF input power	1 W max. for f > 500 MHz 100 mW for f < 500 MHz V <sub>CTL</sub> = 0/8 V
Supply voltage	8 V
Control voltage	-0.2 V, +8 V
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °C

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

**CAUTION:** Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

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