

## 6 Bit TTL Programmable Phase Shifter, 4 GHz to 8 GHz, 360 degree Phase Range, 5.625 degree Control Step Size, +30 dBm Max Pin, SMA

The FM82P5020 is a 6 Bit Digitally Controlled Programmable Phase Shifter that operates across a frequency band from 4 GHz to 8 GHz. The 50 Ohm design has a phase shift range from 0° to 360° with 6 control bits and a step size of 5.625°. Impressive typical performance includes 6 dB insertion loss, +/- 15° phase flatness, an input 1 dB compression point of +27 dBm, and a maximum RF input power level of +30 dBm. The unit requires -5Vdc bias voltage with 10 mA max DC current. The low profile pin package is aluminum with Nickel plating and supports field replaceable SMA RF connectors and a Micro-D9 female connector for DC Bias and Command Control functions. The module has an operational temperature range from -40°C to +85°C and is guaranteed to meet a series of environmental test conditions for Altitude, Vibration, Humidity, and Shock.



### Features:

- Programmable Phase Shifter
- 4 GHz to 8 GHz
- Phase Shift 0° to 360° typ
- TTL Digital Control
- 6 Control Bits
- Step Size 5.625° typ
- Insertion Loss 6 dB typ
- Phase Flatness +/- 15° typ
- Input P1dB +27 dBm typ
- Maximum RF Input Power +30 dBm
- 50 Ohm Design
- DC Bias -5V @ 10 mA
- Micro-D9 Female Connector
- Field Replaceable Female SMA RF Connectors
- Operational Temperature Range -40°C to +85°C
- Rugged and Compact Aluminum Nickel Plated Package Design
- Environmental Test Conditions Altitude, Vibration, Humidity, Shock

### Electrical Specifications (Values at +25° C, Sea Level)

Description	Min	Typ	Max	Units
Frequency Range	4		8	GHz
Impedance		50		Ohms
Phase Shift		360		Degrees
Phase LSB Step		5.625		Degrees
Input VSWR		1.5:1	2:1	
Output VSWR				
Insertion Loss*		6	8.5	dB
Phase Flatness		±15	±30	Degrees
DC Bias		-5		V
IL Temperature Coefficient		0.008		dB/deg C
Input 1 dB Compression Point		27		dBm
Input IP3		43		dBm
DC Voltage		-5		Volts
DC Current			10	mA
Input Power, CW			30	dBm
Control Bits		6		

\*at 0V DC Control

### Applications:

- Test & Measurement
- Military & Commercial Communications
- Military Electronic Systems

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[sales@fairviewmicrowave.com](mailto:sales@fairviewmicrowave.com)

**Absolute Maximum Rating**

Parameter	Rating
Bias Voltage	-5V±10%
RF Input power	+30dBm



ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in approved ESD Workstation.

**Mechanical Specifications**
**Size**

Length	1.102 in [27.99 mm]
Width/Diameter	0.787 in [19.99 mm]
Height	0.394 in [10.01 mm]
Weight	0.024 lbs [10.89 g]
Body Material and Plating	Aluminum, Gold

**Configuration**

Input Connector	SMA Female
Input Connector Spec.	Field Replaceable
Output Connector	SMA Female
Output Connector Spec.	Field Replaceable

**Environmental Specifications**
**Temperature**

Operating Range	-40 to 85 deg C
Storage Range	-50 to 105 deg C

Humidity	100% RH at 35°C, 95% RH at 40°C
Shock	20G for 11 msec half sine wave, 3 axis both directions
Vibration	25g RMS (15 degrees 2KHz) endurance, 1 hour per axis
Altitude	30,000 Feet

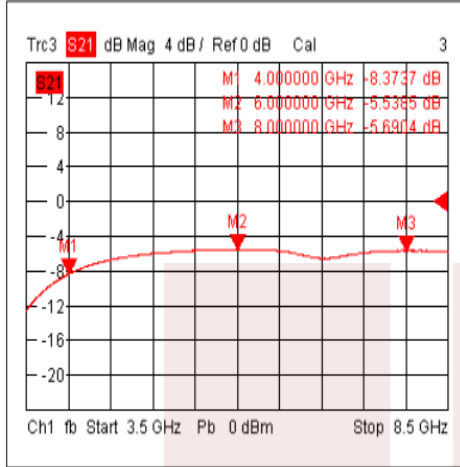
**Compliance Certifications** (see [product page](#) for current document)

**Plotted and Other Data**

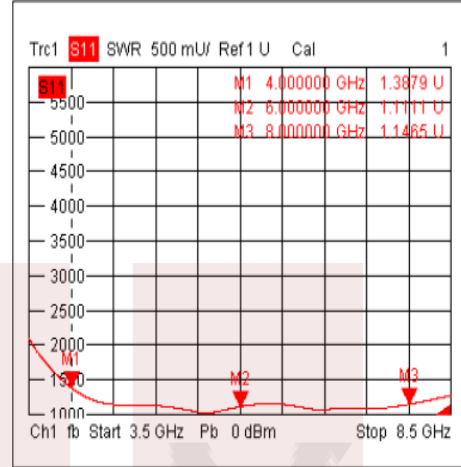
Notes:

**Typical Performance Data**

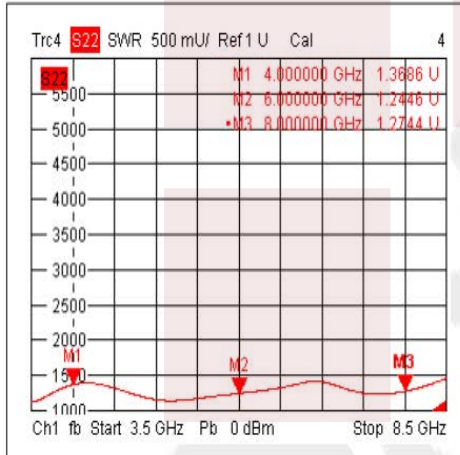
**Insertion Loss @+25°C**



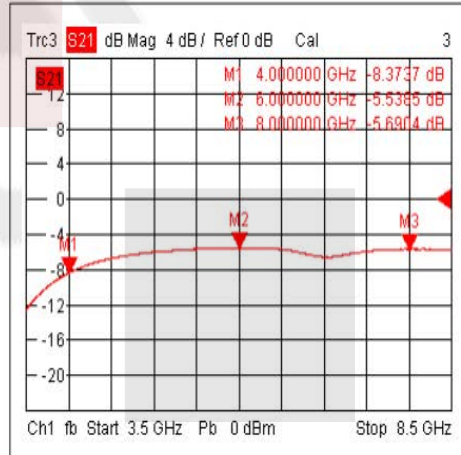
**Input VSWR @+25°C**



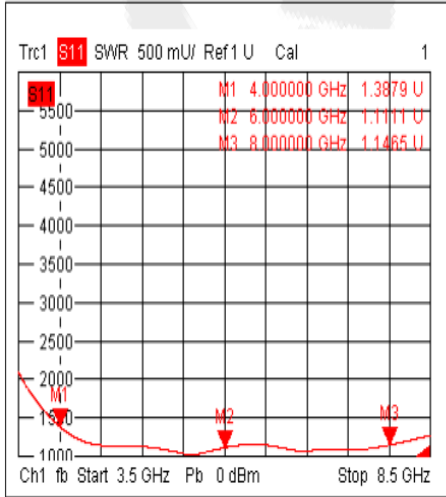
**Output VSWR @+25°C**



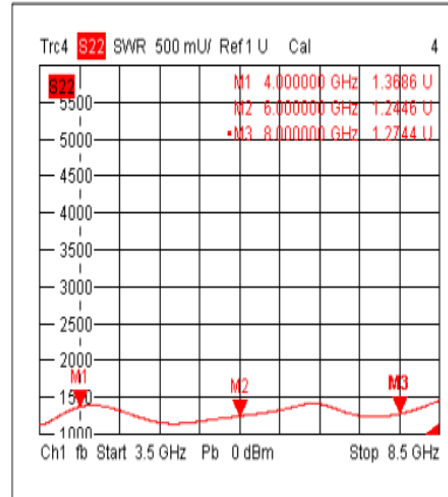
**Insertion Loss @-40°C**



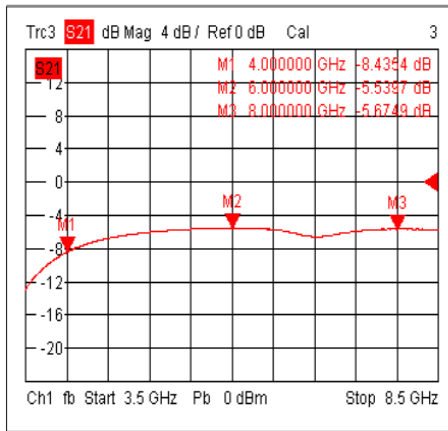
**Input VSWR @-40°C**



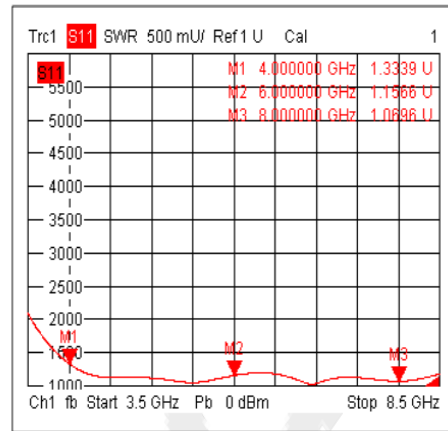
**Output VSWR @-40°C**



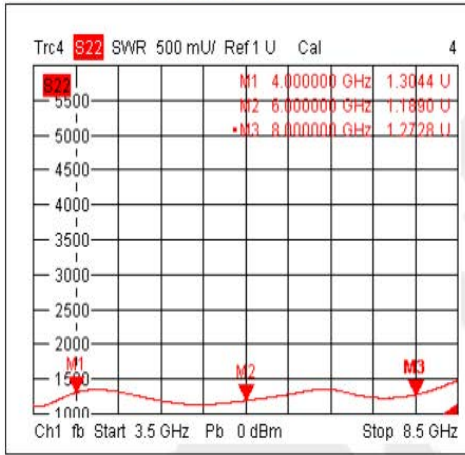
**Insertion Loss @+85°C**



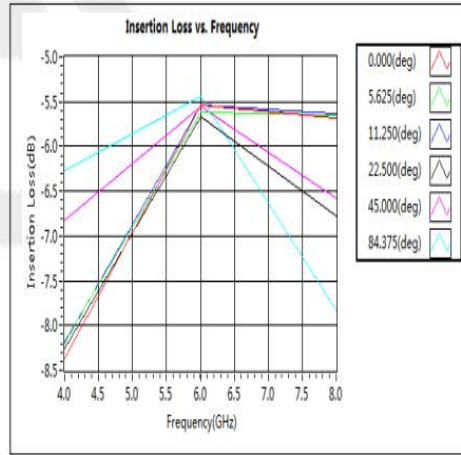
**Input VSWR @+85°C**



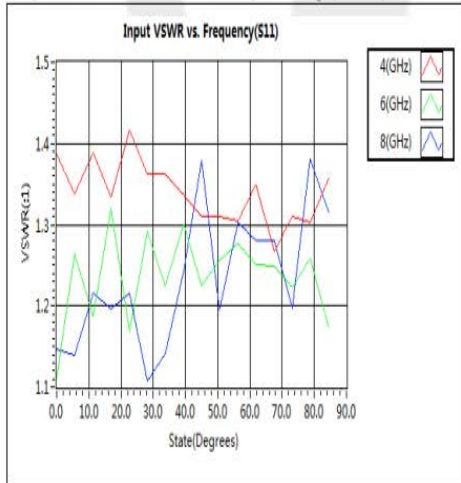
**Output VSWR @+85°C**



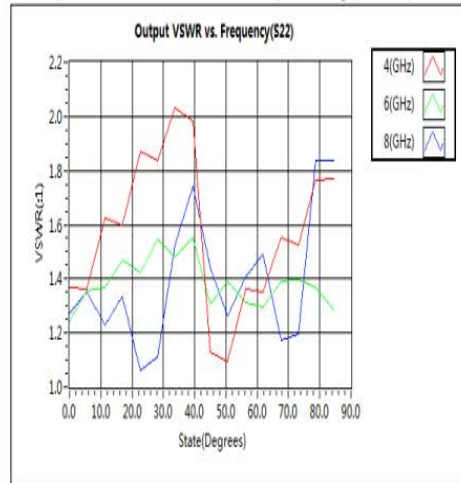
**Insertion Loss vs. Frequency**



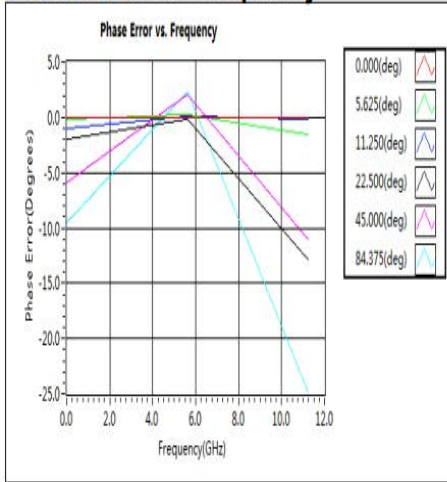
**Input VSWR vs. Frequency(S11)**



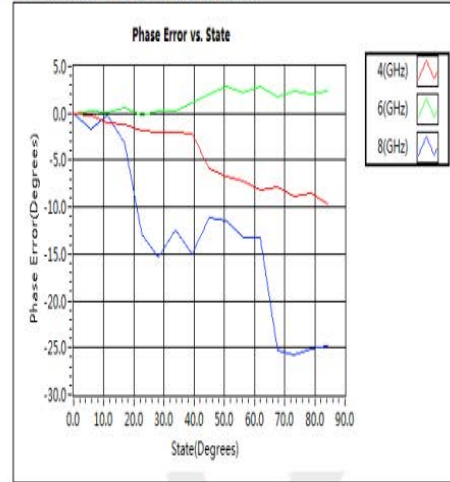
**Output VSWR vs. Frequency(S22)**



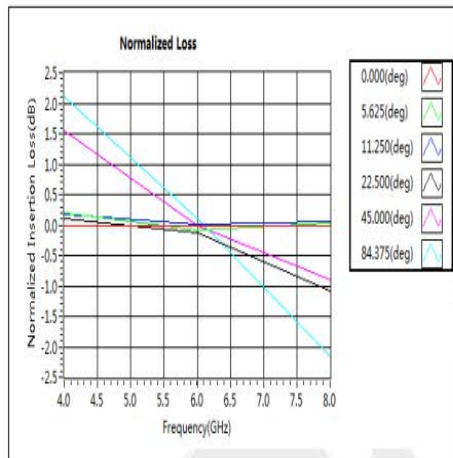
**Phase Error vs. Frequency**



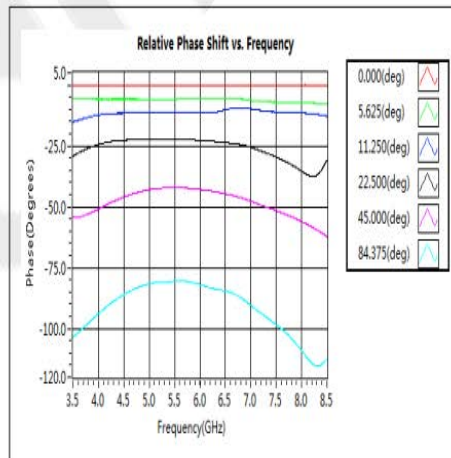
**Phase Error vs. State**



**Normalized Loss . All States**



**Relative Phase Shift vs. Frequency**

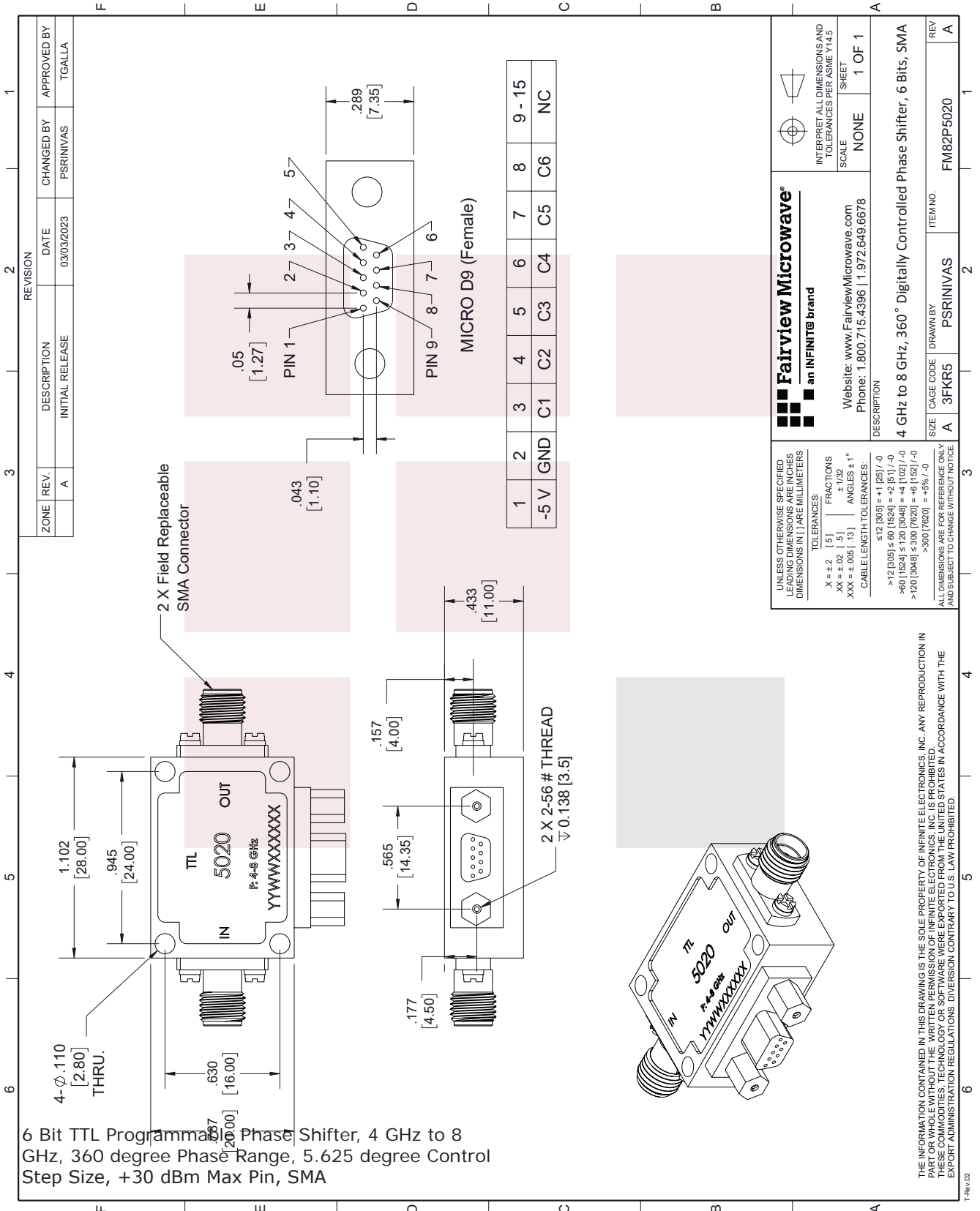


6 Bit TTL Programmable Phase Shifter, 4 GHz to 8 GHz, 360 degree Phase Range, 5.625 degree Control Step Size, +30 dBm Max Pin, SMA from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Lewisville, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: [6 Bit TTL Programmable Phase Shifter, 4 GHz to 8 GHz, 360 degree Phase Range, 5.625 degree Control Step Size, +30 dBm Max Pin, SMA FM82P5020](#)

URL: <https://www.fairviewmicrowave.com/sma-programmable-phase-shifter-4-8-ghz-fm82p5020-p.aspx>

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Website: www.FairviewMicrowave.com Phone: 1.800.715.4396   1.972.649.6678		INTERPRET ALL DIMENSIONS AND TOLERANCES PER ASME Y14.5 SCALE: NONE SHEET: 1 OF 1	
DESCRIPTION: 4 GHz to 8 GHz, 360° Digitally Controlled Phase Shifter, 6 Bits, SMA			
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS. DIMENSIONS IN PARENTHESES ARE IN INCHES.	TOLERANCES: .X = ±.2 (5) .XX = ±.02 (.5) .XXX = ±.005 (.13)	FRACTIONS: ±.1/32 ANGLES ± 1°	CABLE LENGTH TOLERANCES: ≤ 12 [305] = ±1 [25] / -0 > 12 [305] ≤ 60 [1524] = +2 [51] / -0 > 60 [1524] ≤ 120 [3048] = +4 [102] / -0 > 120 [3048] ≤ 300 [7620] = +6 [152] / -0 > 300 [7620] = +5% / -0
ALL DIMENSIONS ARE FOR REFERENCE ONLY AND SUBJECT TO CHANGE WITHOUT NOTICE.			
SIZE: A CAGE CODE: 3FKR5	DRAWN BY: PSRINIVAS	ITEM NO.: FM82P5020	REV: A

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