

AM1194 – Amplifier

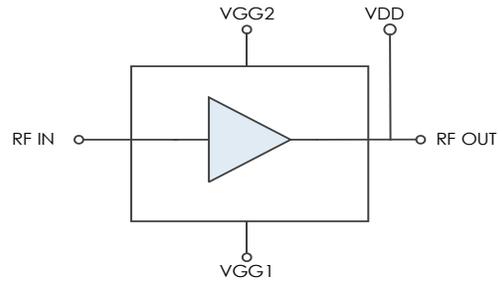
DC to 28 GHz Medium Power Amplifier

AM1194 is a broadband medium power amplifier covering the DC to 28 GHz frequency range. With its high output saturated output power and high linearity across a broad bandwidth, the AM1194 enables high performance test equipment and EW applications. The AM1194 is packaged in a 5mm QFN with internal 50 ohm matching.

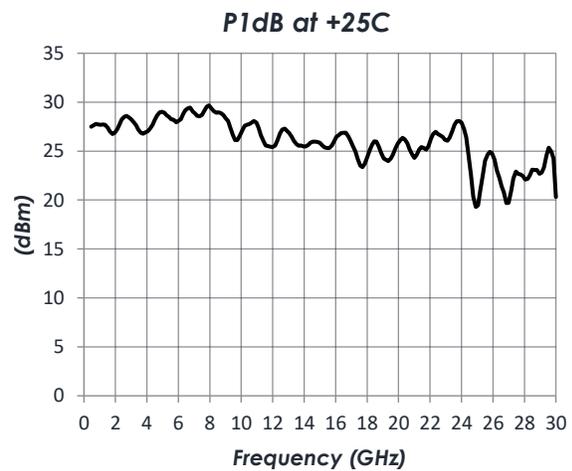
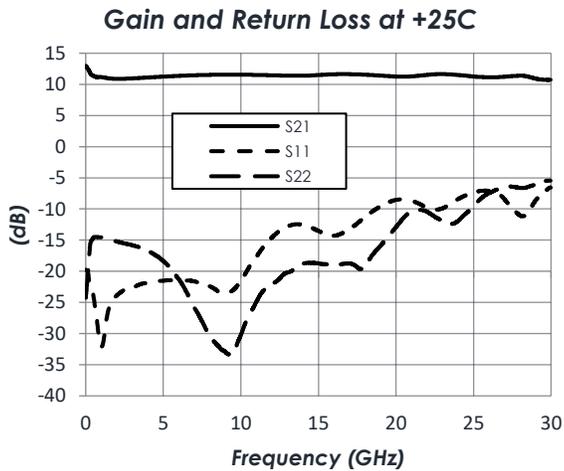
FEATURES

- 11.4 dB Gain
- +25.3 dBm P1dB
- +27.6 dBm Psat
- +35.5 dBm OIP3
- +10V/250mA Operation
- 5mm QFN
- -40C to 85C

FUNCTIONAL DIAGRAM



CHARACTERISTIC PERFORMANCE



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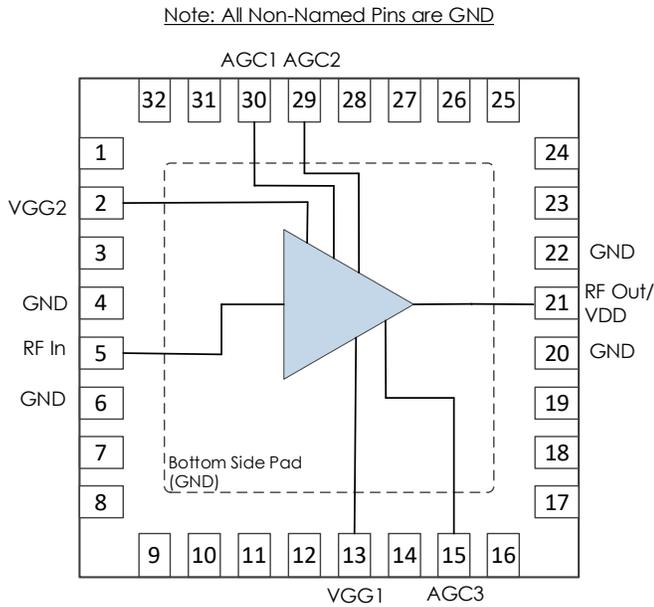
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REVISION HISTORY

Date	Revision	Notes
2/24/2026	1	Initial Release

PIN LAYOUT AND DEFINITIONS



Pin	Name	Function
1	GND	Ground - Common
2	VGG2	Amplifier Gate Control - External bypass capacitors required
3-4	GND	Ground - Common
5	RF In	RF Input - 50 Ohms - DC Coupled
6-12	GND	Ground - Common
13	VGG1	Amplifier Gate Control - External bypass capacitors required
14	GND	Ground - Common
15	ACG3	Low Frequency AC GND - External bypass capacitors required.
16-20	GND	Ground Common
21	RF Output / VDD	RF Output - 50 Ohms - DC Coupled. Also, DC input VDD bias voltage for drain current I _{dd} .
22-28	GND	Ground Common
29	ACG2	Low Frequency AC GND - External bypass capacitors required.
30	ACG1	Low Frequency AC GND - External bypass capacitors required.
31-32	GND	Ground - Common

Note: All unnamed pins should be grounded.

SPECIFICATIONS

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	0V	12V
RF Input Power		+24dBm
VGG1	-3.0	0V
VGG2	VDD - VGG1 - 6V	VDD - 5.5V
Storage Temperature Range	-55 C	+150 C

Thermal Information

	Thermal Resistance (°C / W)
Thermal Resistance (channel to backside ground)	36.2 C/W
Nominal Junction Temperature at +85 C ambient	175 C
Channel Temperature to Maintain 1 Million Hour MTTF	196 C

Note: Any device operation beyond the Absolute Maximum Ratings may result in permanent damage to the device. The values listed in this table are extremes and do not imply functional operation of the device at these or any other conditions beyond what is listed under Recommended Operating Conditions. Any part subjected to conditions outside of what is recommended for an extended amount of time may suffer from reliability concerns.

Handling Information

	Minimum	Maximum
Moisture Sensitivity Level	MSL 3	



Mercury products are electrostatic sensitive. Follow safe handling practices to avoid damage.

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage		+10.0 V	+12.0 V
Operating Case Temperature	-40C		+85C

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
VDD Supply Voltage			+10.0 V	
Gate Voltage 1 (VGG1)	Note 1		-0.5V	
Gate Voltage 2 (VGG2)			+3.5V	
VDD Supply Current	Note 1		250 mA	
Power Dissipated	VDD = +10.0 V		2.500 W	

Note:

1. Adjust VGG1 between -2 V to 0 V to achieve 250mA quiescent drain current on VDD supply voltage.

RF Performance

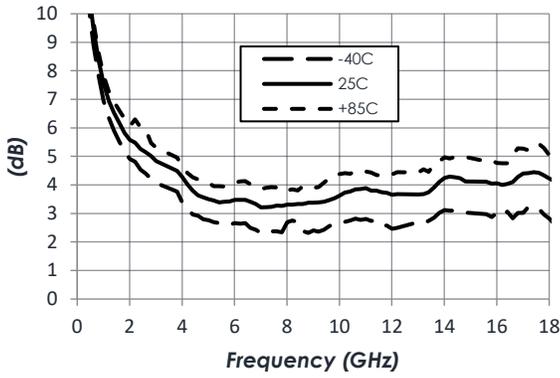
(T = 25 °C unless otherwise specified)

Param	Testing Conditions	Min	Typical	Max
Frequency Range		DC		28 GHz
Gain	f = 5 GHz		11.5 dB	
	f = 14 GHz		11.2 dB	
	f = 28 GHz		11.4 dB	
Return Loss	f = 5 GHz		-20.1 dB	
	f = 14 GHz		-19.4 dB	
	f = 28 GHz		-13.4dB	
Output IP3	f = 14 GHz		35.5 dBm	
Output P1dB	f = 14 GHz		25.1 dBm	
Noise Figure	f = 14 GHz		4.2dB	

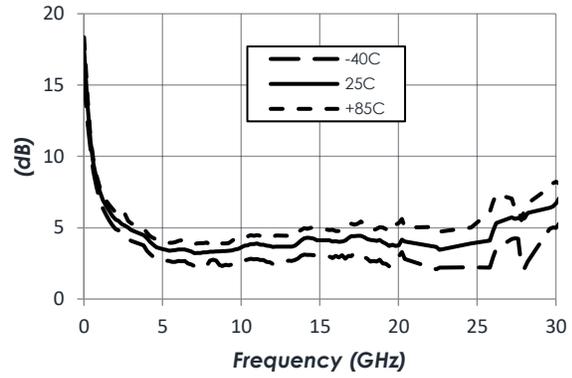
TYPICAL PERFORMANCE

(ID = 250mA, T = 25°C unless otherwise specified)

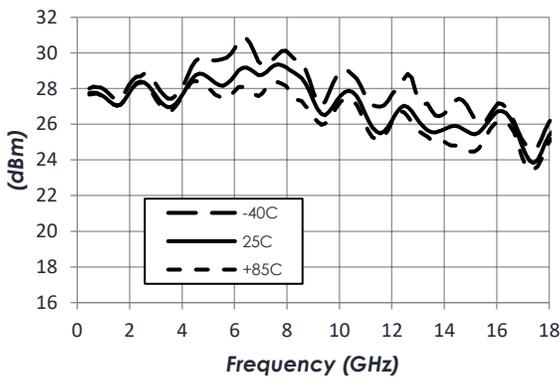
Noise Figure vs Temperature



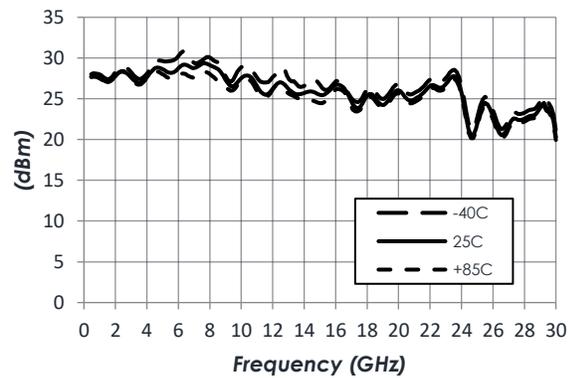
Noise Figure vs Temperature



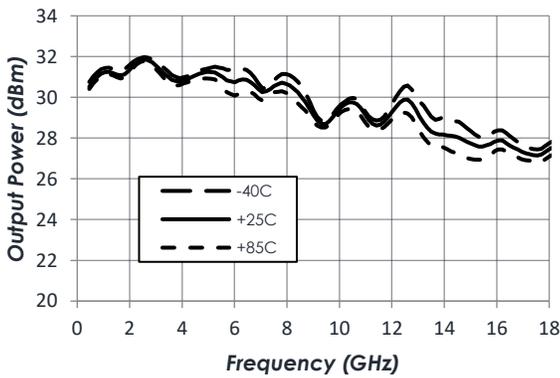
P1dB vs Temperature



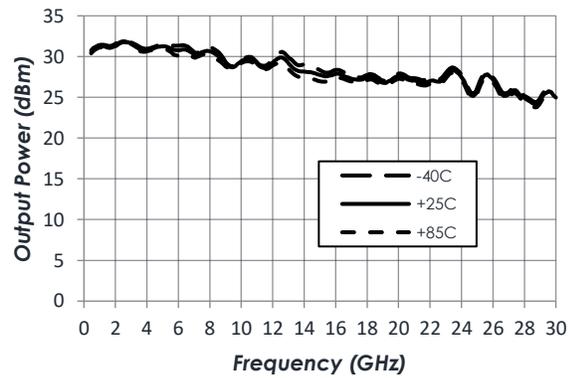
P1dB vs Temperature



P_Sat vs Temperature



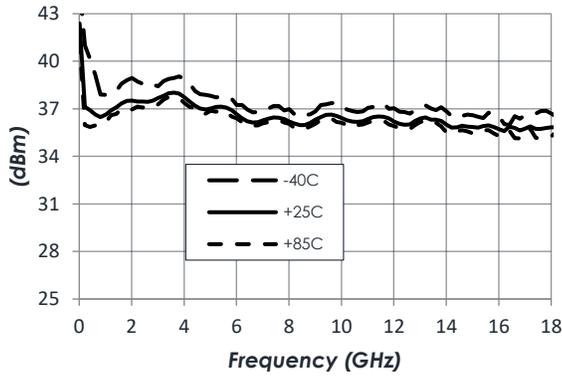
P_Sat vs Temperature



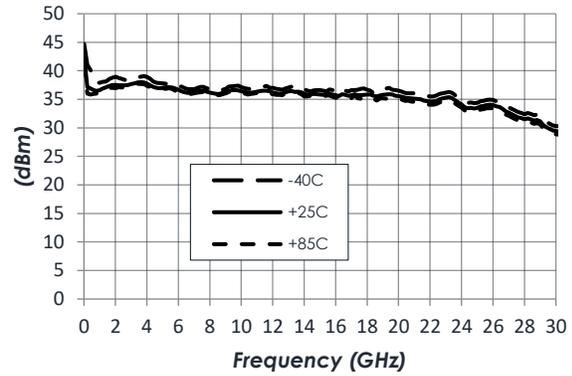
TYPICAL PERFORMANCE (Continued)

(ID = 250mA, T = 25°C unless otherwise specified)

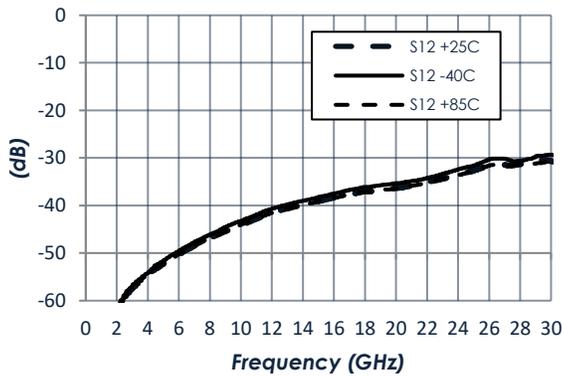
Output IP3 vs Temperature



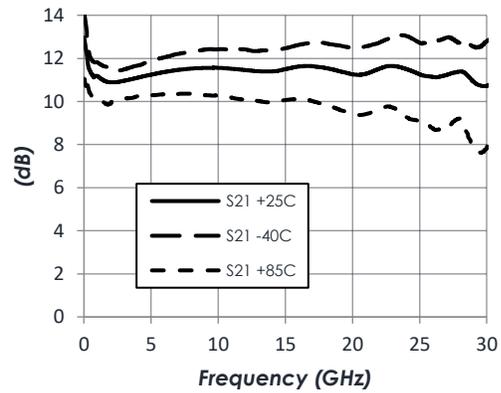
Output IP3 vs Temperature



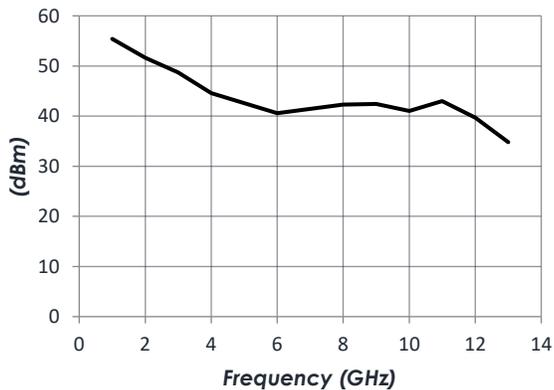
Reverse Isolation vs Temperature



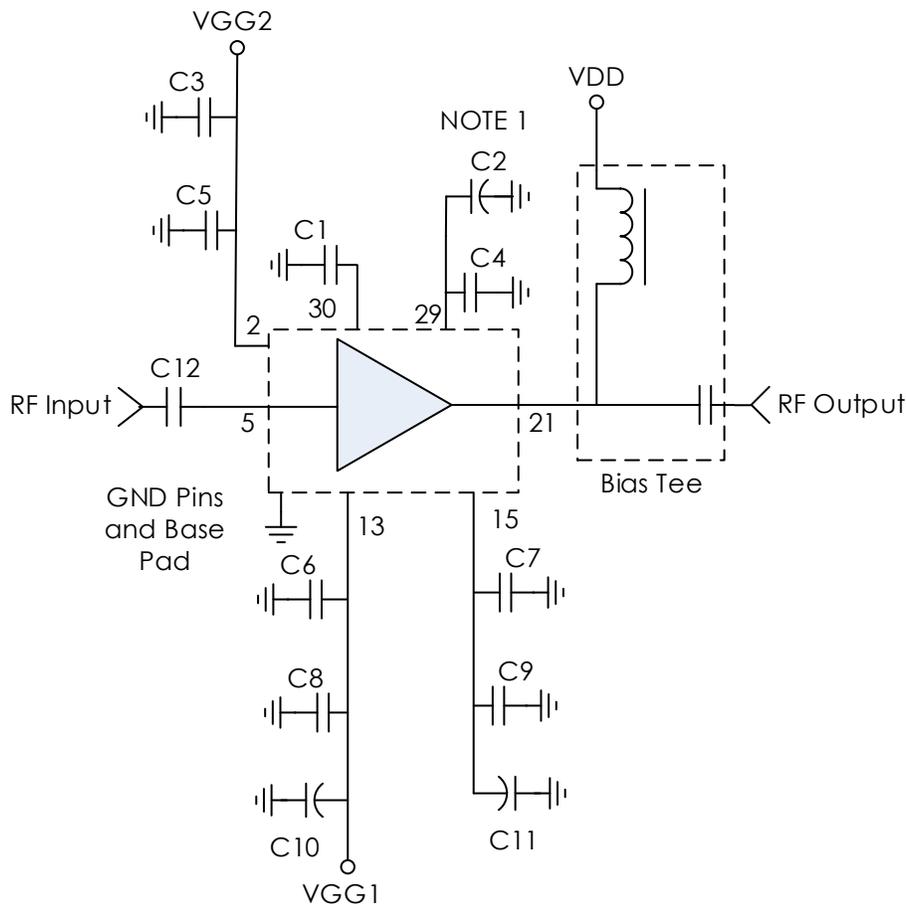
Gain vs Temperature



OIP2 at +25C, Pout/tone = 0dBm



TYPICAL APPLICATION



RECOMMENDED COMPONENT LIST (OR EQUIVALENT)

Part	Value	Part Number	Manufacturer
C2, C10, C11	4.7uF	TCTAL1E475M8R	Kyocera AVX
C1, C5, C6, C7	100 pF	GRM1555C1H101FA01J	Murata
C3, C4, C8, C9	10000pF	GRM155R71H103JA88D	Murata
C12	0.1uF	0201BB104KW160	Passives Plus

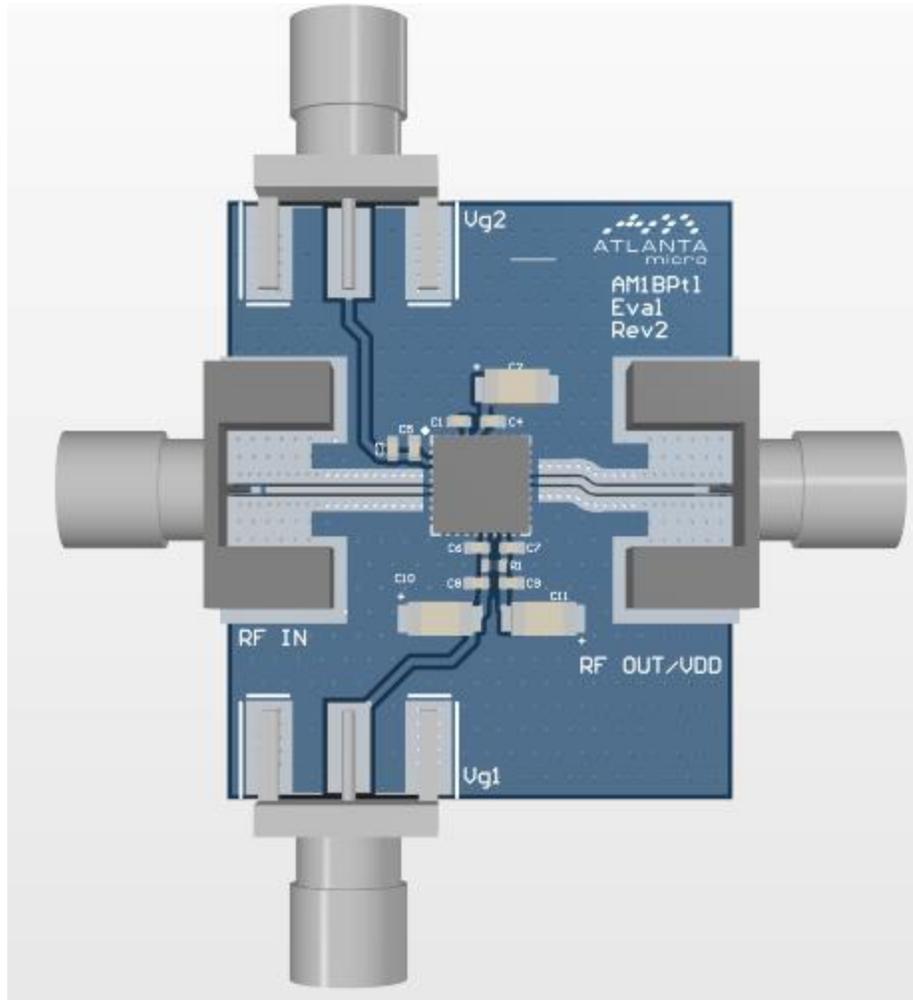
Note 1:

- Optional capacitors C2 and C11 should be used if operating below 200MHz.
- AM1194 is not AC Coupled. Add external capacitor C12 as shown in typical application.
- Bias tee should be optimized for frequency band of interest.
- Bias Tee needs to be able to handle at least 500mA of DC current.
- Performance data shown has bias tee effects de-embedded.
- Use RF circuit design techniques.

Note 2

1. AM1194 is biased with one positive drain supply, one positive gate supply, and one negative gate supply. Biasing procedure is as follows:
 - a. Turn on Procedure
 - i. Apply -2V to the VGG1 pin
 - ii. Apply 3.5V to the VGG2 pin
 - iii. Apply 10V to the VDD pin
 - iv. Increase (towards zero) the VGG1 voltage until the current draw from the 10V rail is 250mA. Nominally -0.49V
 - v. Apply RF signal
 - b. Turn Off Procedure
 - i. Remove RF signal
 - ii. Reduce the VGG1 voltage to -2V
 - iii. Turn off 3.5V from the VGG2 pin
 - iv. Turn off 10V from the VDD pin
 - v. Turn off -2V from the VGG1 pin

EVALUATION PC BOARD



RELATED PARTS

Part Number		Description		
AM1173	6GHz to 18GHz	Medium Power Amplifier		
AM1175	6GHz to 18GHz	Driver Amplifier		

COMPONENT COMPLIANCE INFORMATION

RoHS: Mercury Systems, Inc. hereby certifies that all products comply with the EC Directive 2011/65/EC on the Restriction of Hazardous Substances, commonly known as EU-RoHS 6 and 10. All products supplied by Mercury shall be compliant with the European Directive 2011/65/EC based on the following substance list.

Substance List	Allowable Maximum Concentration
Lead (Pb)	<1000 PPM (0.1% by weight)
Mercury (Hg)	<1000 PPM (0.1% by weight)
Cadmium (Cd)	<75 PPM (0.0075% by weight)
Hexavalent Chromium (CrVI)	<1000 PPM (0.1% by weight)
Polybrominated Biphenyls (PBB)	<1000 PPM (0.1% by weight)
Polybrominated Diphenyl ethers (PBDE)	<1000 PPM (0.1% by weight)
Decabromodiphenyl Deca BDE	<1000 PPM (0.1% by weight)
Bis (2-ethylhexyl) Phthalate (DEHP)	<1000 PPM (0.1% by weight)
Butyl Benzyl Phthalate (BBP)	<1000 PPM (0.1% by weight)
Dibutyl Phthalate (DBP)	<1000 PPM (0.1% by weight)
Diisobutyl Phthalate (DIBP)	<1000 PPM (0.1% by weight)

REACH: Mercury Systems, Inc. neither uses nor intentionally adds any of the substances considered to be a Substance of Very High Concern (SVHC) as defined by the EU Regulation (EC) No. 1907-2006 on Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH).

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Mercury takes its responsibility as a global partner seriously and will use due diligence within our supply chain to ensure all standards are met to the best of our knowledge.



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