Rochester Electronics®

Datasheet

FAN7023

1W CMOS Mono Power Amplifier

The FAN7023 is a bridge connected audio power amplifier capable of delivering 1W of continuous average power to an 8Ω load with less than 0.2% (THD) from a 5V power supply. The FAN7023 requires few external components and operates on low supply voltage from 2.2V to 5.5V. Since the FAN7023 does not require output coupling capacitors, bootstrap capacitors, or snubber networks, it is ideally suited for low power portable systems that require minimum volume and weight. The FAN7023 features an externally controlled gain, low power consumption shutdown mode (0.01uA,typ.). Additional FAN7023 features include thermal shutdown protection, unity gain stability, and external gain set.

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All re-creations are done with the approval of the Original Component Manufacturer (OCM).

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceeds the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)
    - Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OCM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

FOR REFERENCE ONLY

FAN7023

1W CMOS Mono Power Amplifier

Features

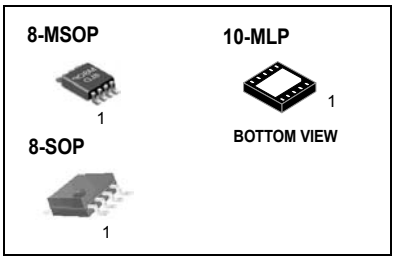
- Continuous Average Power is 1.0W (8Ω)
- Low THD: Typical 0.2% @ 1kHz (5V)
- Do Not Need Output Coupling Capacitor or Bootstrap Capacitor
- Low Shutdown Current: Typical 0.01μA
- Shutdown: High Active
- Built in TSD Circuit

Typical Applications

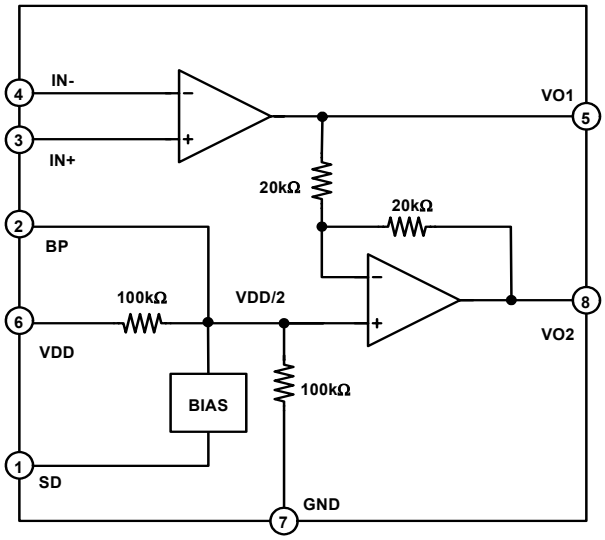
- Cellular Phone
- PDA
- Portable Audio Systems

Description

The FAN7023 is a bridge connected audio power amplifier capable of delivering 1W of continuous average power to an 8Ω load with less than 0.2%(THD) from a 5V power supply. The FAN7023 requires few external components and operates on low supply voltage from 2.2V to 5.5V. Since the FAN7023 does not require output coupling capacitors, bootstrap capacitors, or snubber networks, it is ideally suited for low power portable systems that require minimum volume and weight. The FAN7023 features an externally controlled gain, low power consumption shutdown mode (0.01uA,typ.). Additional FAN7023 features include thermal shutdown protection, unity gain stability, and external gain set.

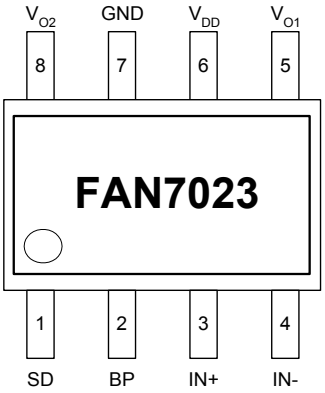


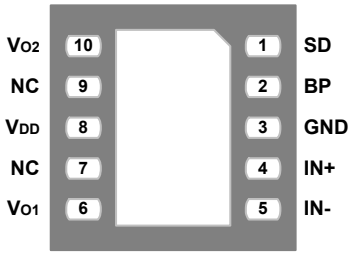
Internal Block Diagram



Rev. 1.1.0

Pin Assignments





10-MLP(BOTTOM VIEW)

Pin Definitions

( ) : 10MLP

Pin Number	Pin Name	Pin Function Description
1(1)	SD	Shutdown
2(2)	BP	Bypass
3(4)	IN+	Input+
4(5)	IN-	Input-
5(6)	V_{O1}	Power AMP Output1
6(8)	V_{DD}	Supply Voltage
7(3)	GND	Ground
8(10)	V_{O2}	Power AMP Output2

Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Value	Unit	Remark
Maximum Supply Voltage	V_{DD}	6.0	V	
Power Dissipation	P_D	Internally Limited	W	
Operating Temperature	T_{OPR}	-40 ~ +85	°C	
Storage Temperature	T_{STG}	-65 ~ +150	°C	
Junction Temperature	T_J	150	°C	
Thermal Resistance (Junction to Ambient)	Rthja	190	°C/W	8MSOP
		166		10MLP, Single-Layer
		50		10MLP, Multi-Layer

Recommended Operating Conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Supply Voltage	V_{DD}	2.2	-	5.5	V

Electrical Characteristics

(R_L = 8Ω, Ta = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
V_{DD} = 5.0V, UNLESS OTHERWISE SPECIFIED						
Quiescent Power Supply Current	I_{DD}	V_{IN} = 0V,I_O = 0A	-	1.8	6	mA
Shutdown Current	I_{SD}	V_{SD} = V_{DD}	-	0.01	2.0	μA
Output Offset Voltage	V_{OS}	V_{IN} = 0V	-	5	50	mV
Output Power	P_O	THD = 1% (Max.); f = 1kHz	-	1	-	W
Total Harmonic Distortion+Noise	THD+N	P_O = 0.25W_{rms},gain = 2, f =1kHz	-	0.1	-	%
Power Supply Rejection Ratio	PSRR	V_{DD} ±250mVp, f = 1kHz	-	65	-	dB
V_{DD} = 3.3V, UNLESS OTHERWISE SPECIFIED						
Quiescent Power Supply Current	I_{DD}	V_{IN} = 0V,I_O = 0A	-	1.5	-	mA
Shutdown Current	I_{SD}	V_{SD} = V_{DD}	-	0.01	-	μA
Output Offset Voltage	V_{OS}	V_{IN} = 0V	-	5	-	mV
Output Power	P_O	THD = 1% (Max.);f = 1kHz	-	0.45	-	W
Total Harmonic Distortion+Noise	THD+N	P_O = 0.25Wrms, gain =2, f = 1kHz	-	0.15	-	%
Power Supply Rejection Ratio	PSRR	V_{DD} ±250mVp, f = 1kHz	-	65	-	dB
V_{DD} = 2.6V, UNLESS OTHERWISE SPECIFIED						
Quiescent Power Supply Current	I_{DD}	V_{IN} = 0V,I_O = 0A	-	1.3	-	mA
Shutdown Current	I_{SD}	V_{SD} = V_{DD}	-	0.01	-	μA
Output Offset Voltage	V_{OS}	V_{IN} = 0V	-	5	-	mV
Output Power	P_O	THD = 1% (Max.);f = 1kHz	-	0.2	-	W
Total Harmonic Distortion+Noise	THD+N	P_O = 0.2Wrms, gain = 2, f = 1kHz	-	0.25	-	%
Power Supply Rejection Ratio	PSRR	V_{DD} ±250mVp, f = 1kHz	-	65	-	dB

Performance Characteristics

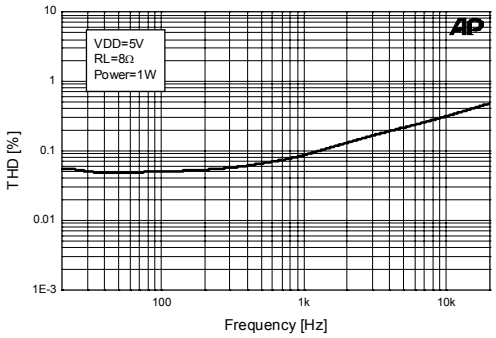


Figure 1. THD+N vs. Frequency, V_{DD} =5V

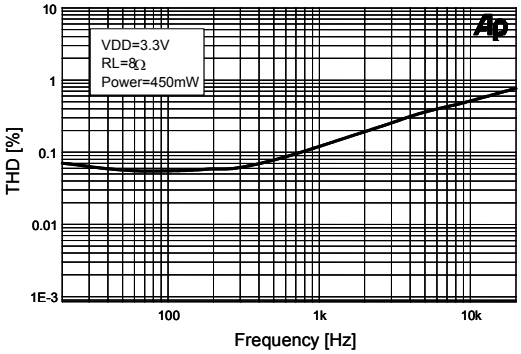


Figure 2. THD+N vs. Frequency, V_{DD} =3.3V

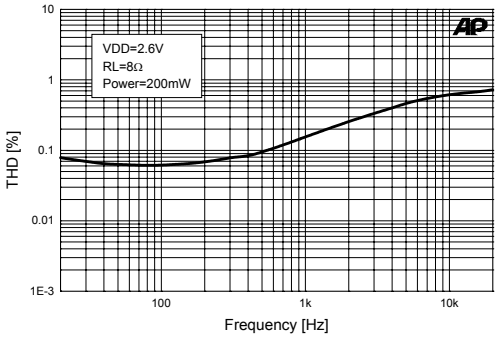


Figure 3. THD+N vs. Frequency, V_{DD} =2.6V

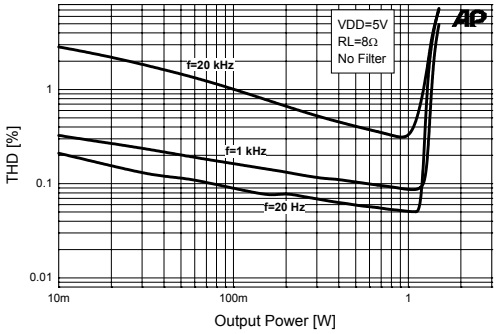


Figure 4. THD+N vs. Output Power, V_{DD} =5V

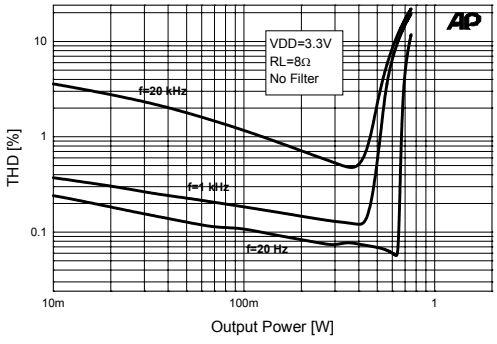


Figure 5. THD+N vs. Output Power, V_{DD} =3.3V

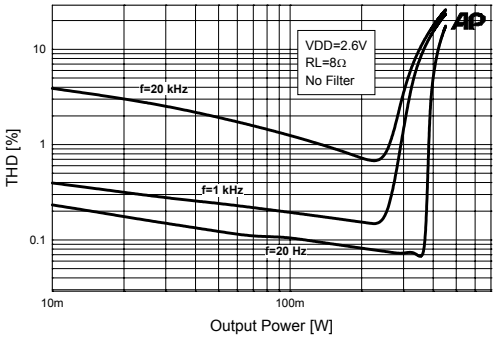


Figure 6. THD+N vs. Output Power, V_{DD} =2.6V

Performance Characteristics (Continued)

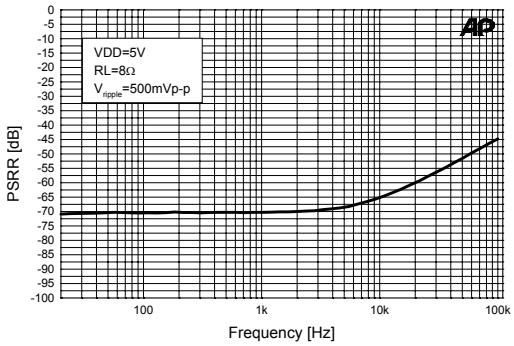


Figure 7. Power Supply Rejection Ratio, V_{DD} =5V Input Floating

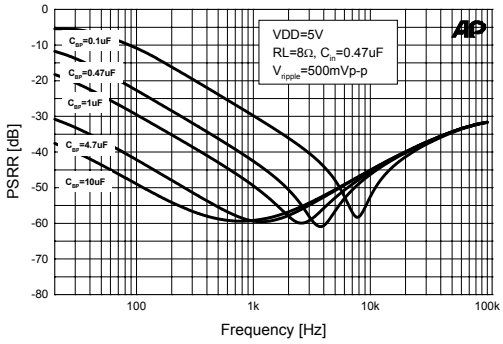


Figure 8. Power Supply Rejection Ratio with Capacitor, V_{DD} =5V Input Terminated to GND

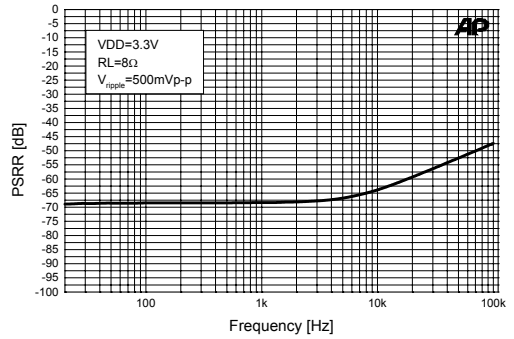


Figure 9. Power Supply Rejection Ratio, V_{DD} =3.3V Input Floating

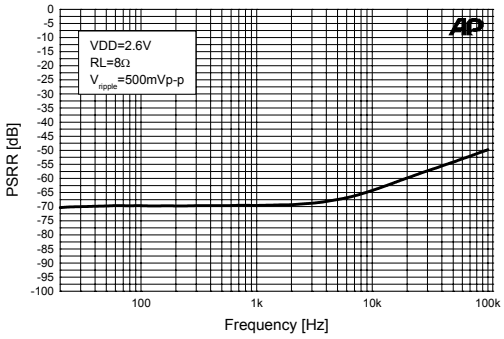


Figure 10. Power Supply Rejection Ratio, V_{DD} =2.6V Input Floating

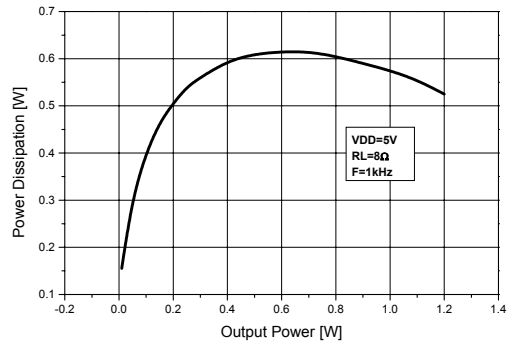


Figure 11. Power Dissipation vs. Output Power, V_{DD} =5V @ THD ≤ 1% (No Filter)

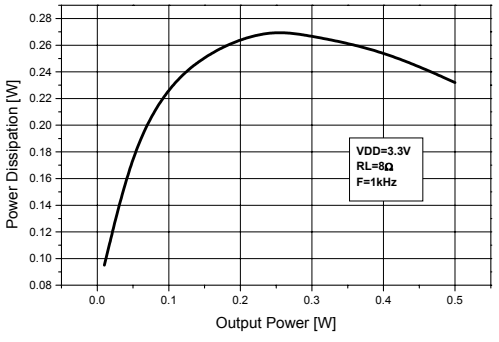


Figure 12. Power Dissipation vs. Output Power, V_{DD} =3.3V @ THD ≤ 1% (No Filter)

Performance Characteristics (Continued)

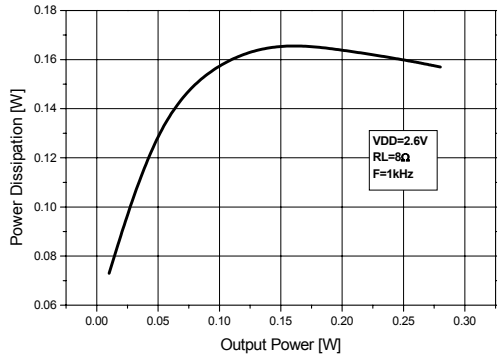


Figure 13. Power Dissipation vs. Output Power, V_{DD} =2.6V @ THD ≤ 1% (No Filter)

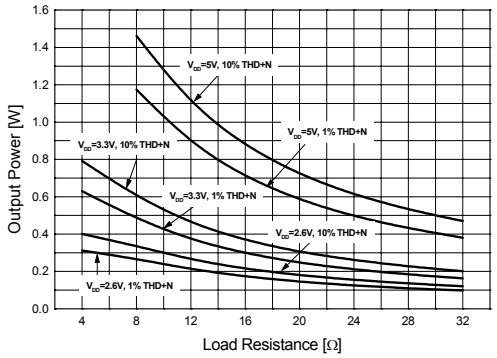


Figure 14. Output Power vs. Load Resistance

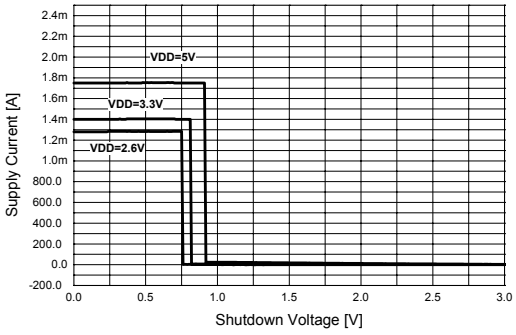


Figure 15. Supply Current vs. Shutdown Voltage

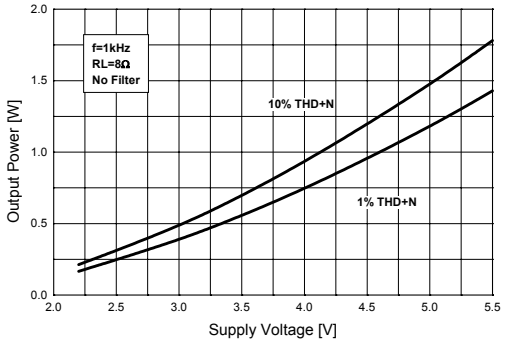


Figure 16. Output Power vs. Supply Voltage

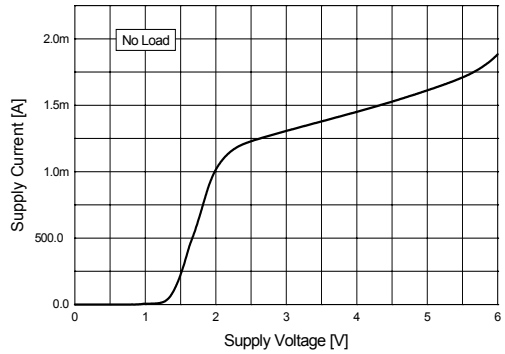


Figure 17. Supply Current vs. Supply Voltage

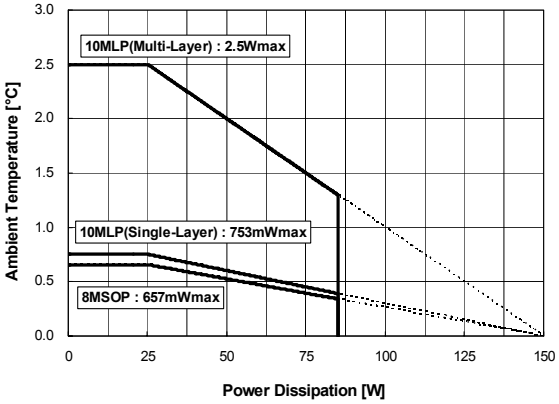
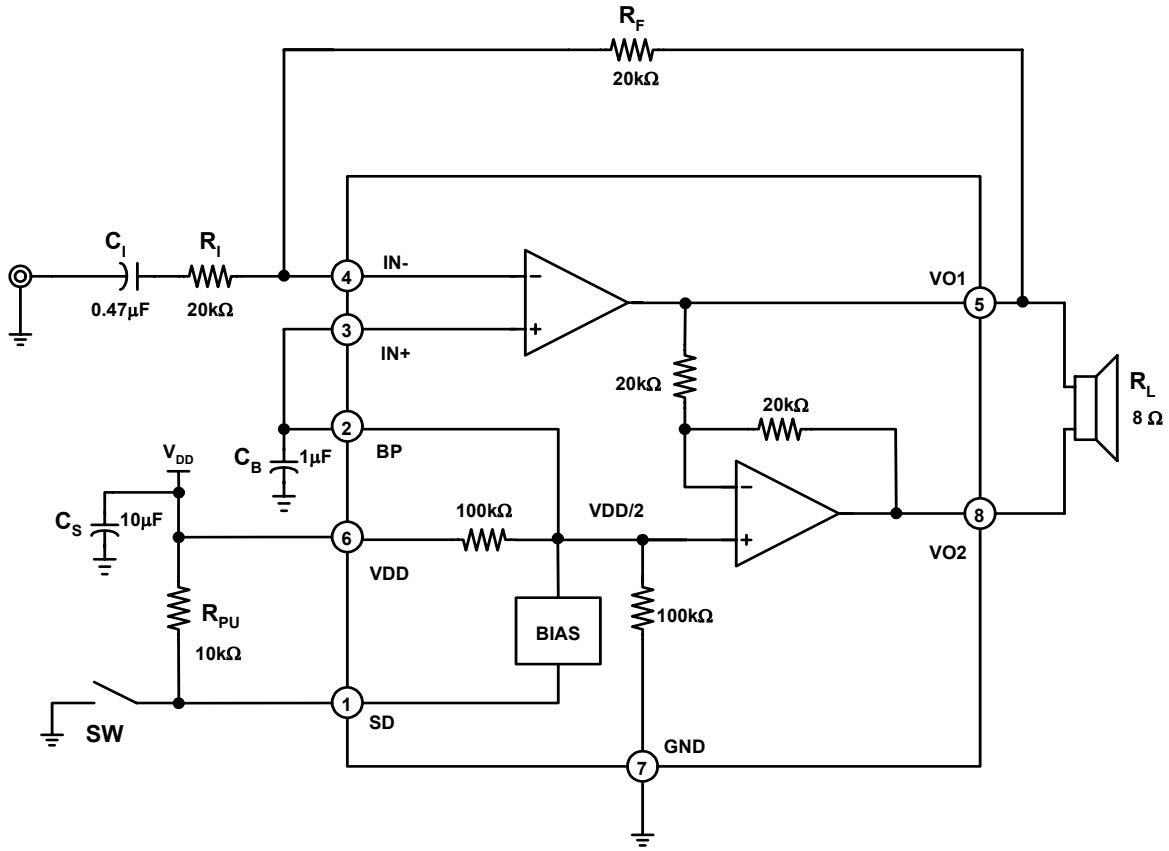


Figure 18. Power Derating Curve

Typical Application Circuit

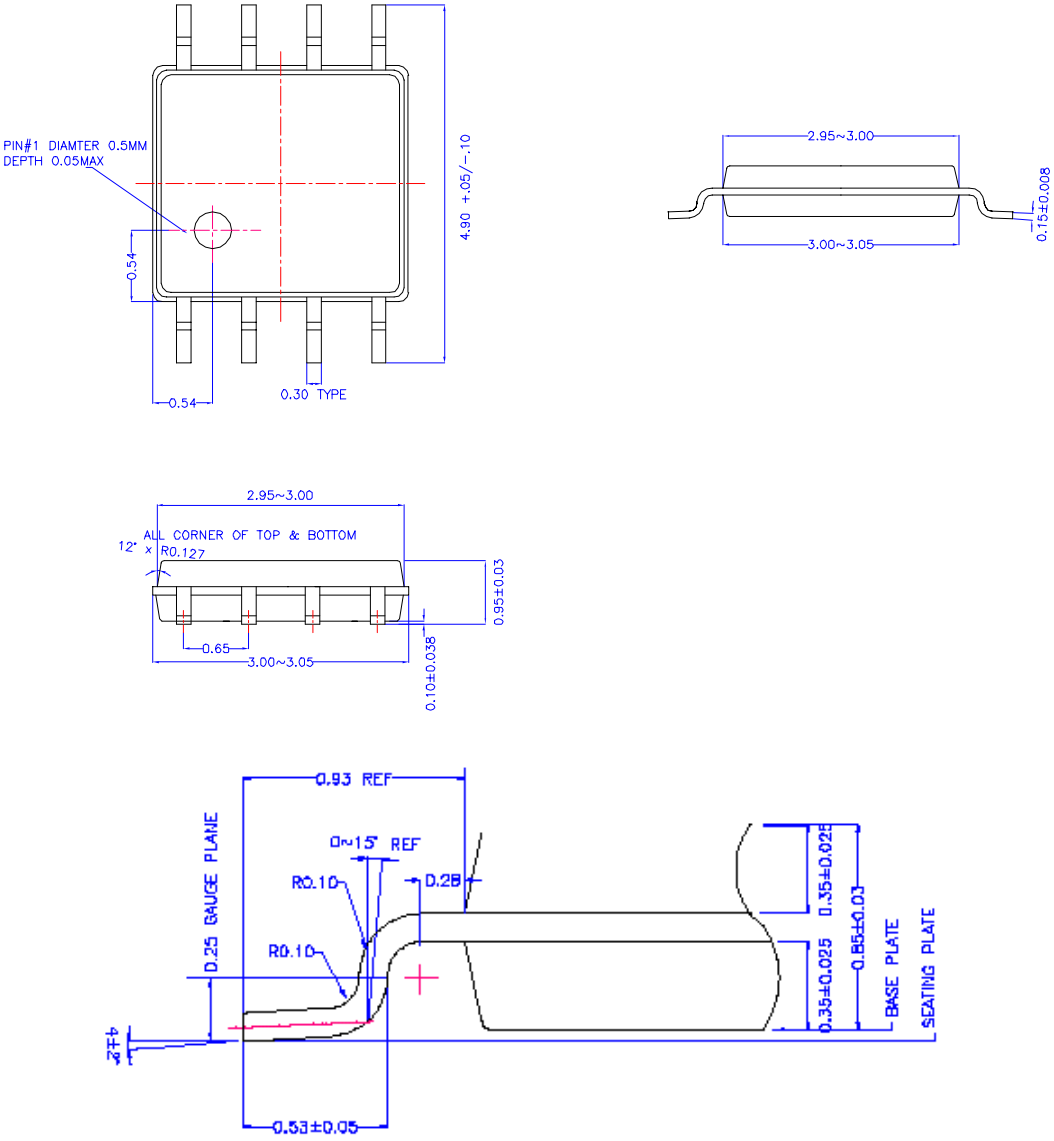


Mechanical Dimensions

Package

Dimensions in millimeters

8-MSOP

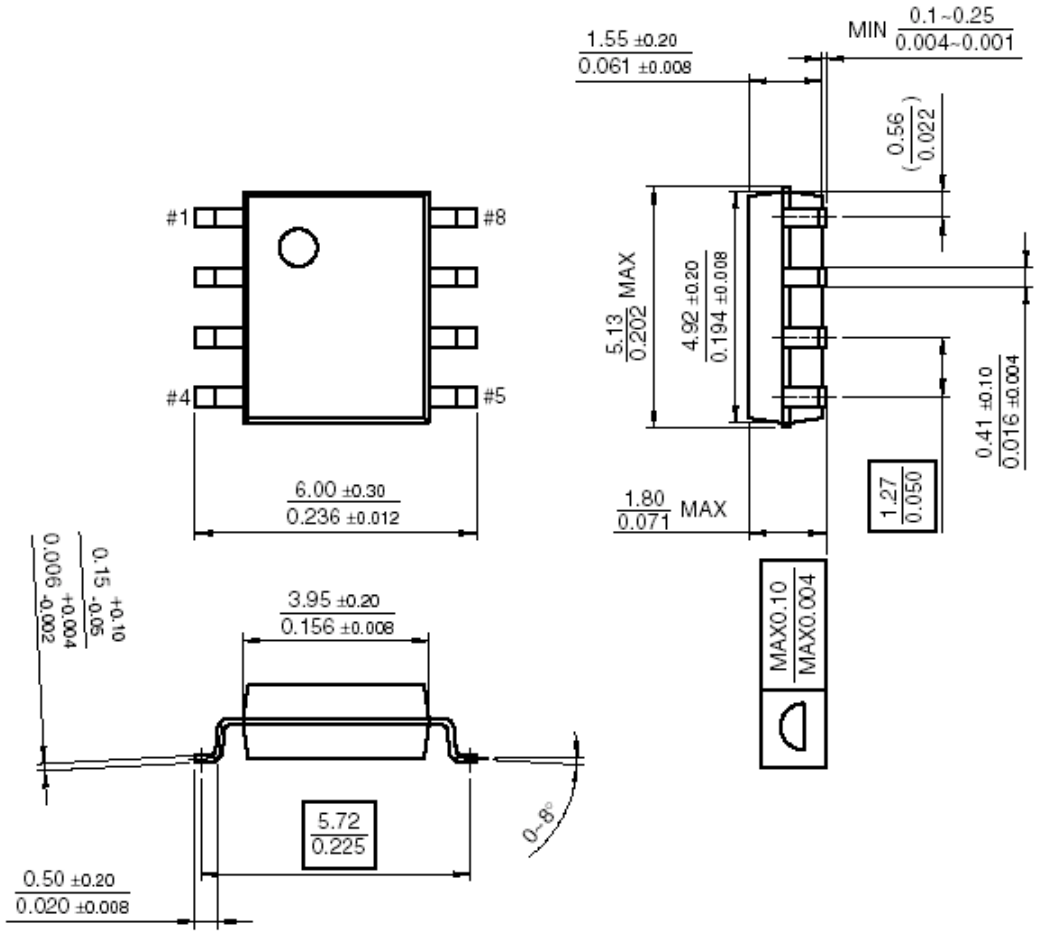


Mechanical Dimensions (Continued)

Package

Dimensions in millimeters/inches

8-SOP

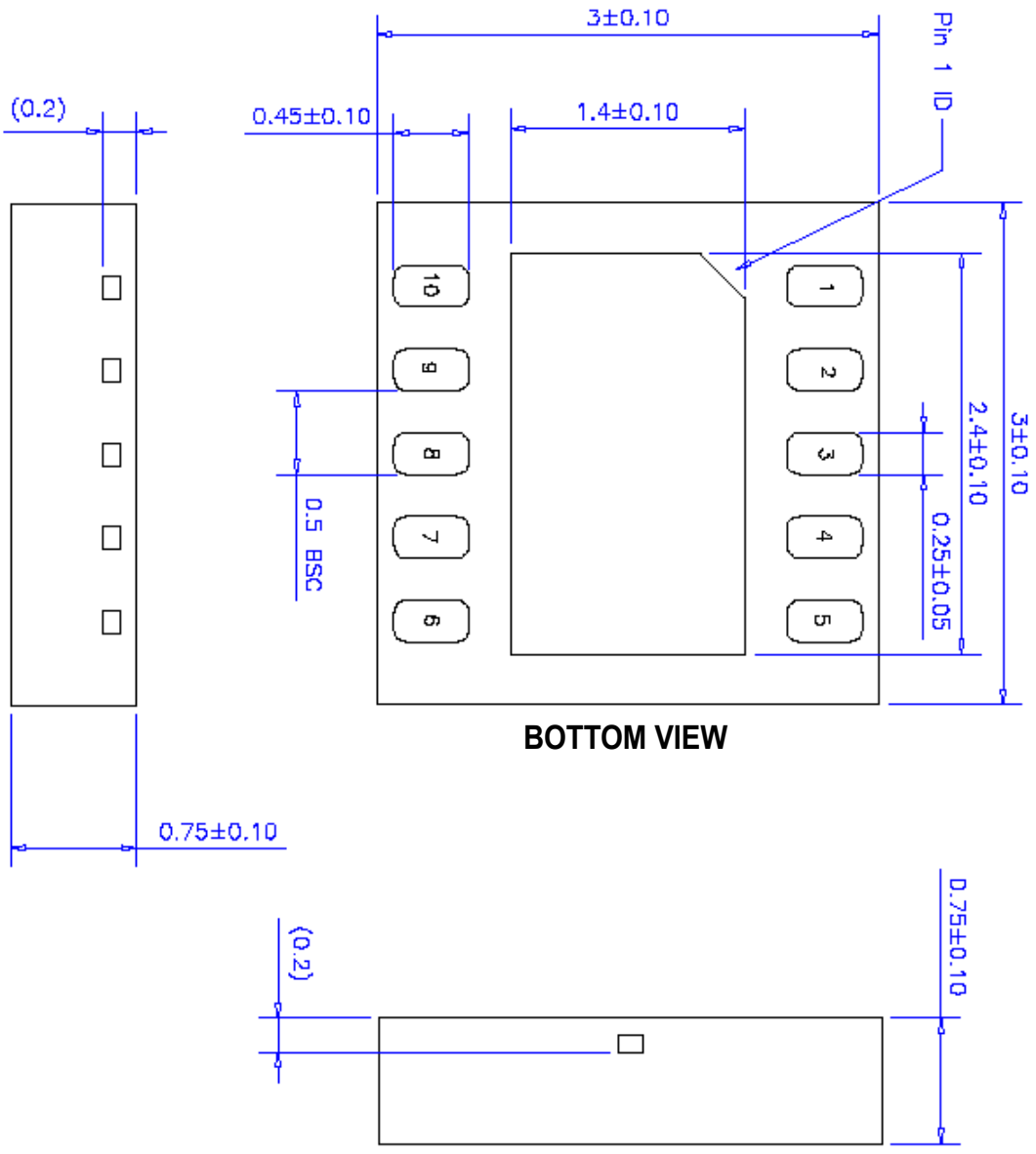


Mechanical Dimensions (Continued)

Package

Dimensions in millimeters

10-MLP



Ordering Information

Device	Package	Operating Temperature	Packing
FAN7023MU	8-MSOP	-40°C ~ +85°C	Tube
FAN7023M	8-SOP		
FAN7023MUX	8-MSOP		Tape& Reel
FAN7023MX	8-SOP		
FAN7023MPX	10-MLP		

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