

MSM6596A-xxx

2-Mbit Serial Voice ROM

GENERAL DESCRIPTION

The MSM6596A is the shorter-TAT processing version of the MSM6596.

The MSM6596A is a serial voice ROM with a 1,048,576-word \times 1-bit \times 2-bank configuration.

The MSM6596A has a built-in internal address-generating circuit. A single, external clock input allows continuous, serial read operations. The internal addresses are automatically incremented by 1 by read operation. 1024 words in X direction and 1024 words in Y direction can be addressed by inputting external serial addresses. Banks are switched with $\overline{CS1}$ and $\overline{CS2}$.

A read and playback device with predetermined messages can easily be configured by storing the voice data into the MSM6596A and combining it with one of OKI's recording and playback ICs and serial register IC.

A serial register is required to drive the MSM6596A by the MSM6388 or MSM6588. (The MSM6596A does not operate without a serial register.)

The major functional differences between the MSM6596A and MSM6596 are shown below.

MSM6596A DC Characteristics

 $V_{DD} = 2.7 \text{ to } 5.5 \text{ V}, T_a = -40 \text{ to } +85^\circ\text{C}$

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	
Current consumption (1)	I_{DD}	$t_{RDC} = 2.5 \mu\text{s}$	—	9	20	mA	
Current consumption (2)	I_{DS}	$\overline{CS1} = \overline{CS2} = V_{DD} - 0.2 \text{ V}$	$T_a = -40$ to $+70^\circ\text{C}$	—	—	10	μA
			$T_a = -40$ to $+85^\circ\text{C}$	—	—	50	

Typical values are at $V_{DD} = 5.0 \text{ V}, T_a = 25^\circ\text{C}$.

MSM6596 DC Characteristics

 $V_{DD} = 3.5 \text{ to } 5.5 \text{ V}, T_a = -40 \text{ to } +85^\circ\text{C}$

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Current consumption (1)	I_{DD}	$t_{RDC} = 2.5 \mu\text{s}$	—	—	15	mA
Current consumption (2)	I_{DS}	$\overline{CS1} = \overline{CS2} = V_{DD} - 0.2 \text{ V}$	—	—	10	μA

Typical values are at $V_{DD} = 5.0 \text{ V}, T_a = 25^\circ\text{C}$.

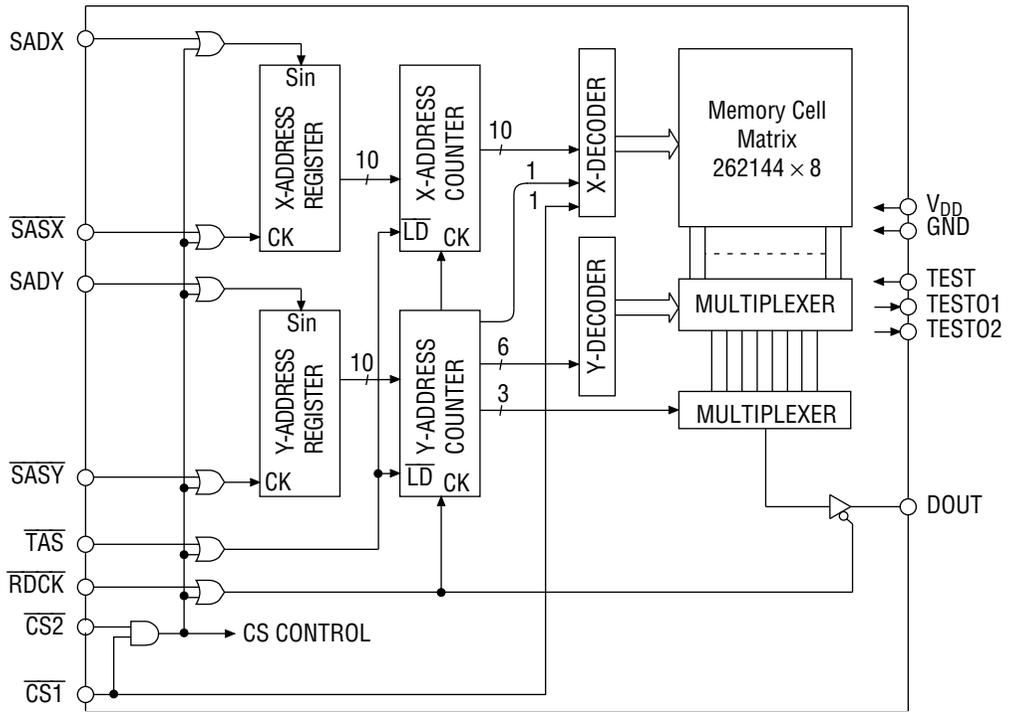
For other details, refer to individual sections in this data sheet.

FEATURES

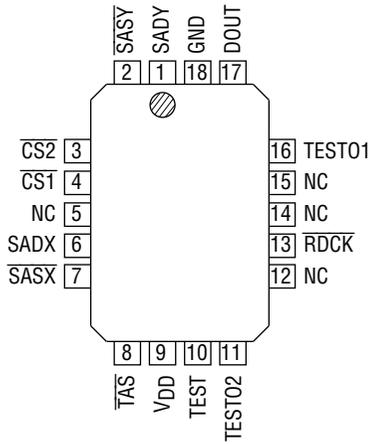
- Configuration : 1,048,576 words \times 1 bit \times 2 banks
- Serial access : Read cycle time of 2.5 μs
- Shorter-TAT processing
- Power-supply voltage : 2.7 to 5.5 V
- Package options :

18-pin plastic QFJ (QFJ18-P-R290-1.27)	(Product name : MSM6596A-xxxJS)
24-pin plastic SOP (SOP24-P-430-1.27-K)	(Product name : MSM6596A-xxxGS-K)
18-pin plastic DIP (DIP18-P-300-2.54)	(Product name : MSM6596A-xxxRS)
30-pin plastic SSOP (SSOP30-P-56-0.65-K)	(Product name : MSM6596A-xxxGS-AK)

BLOCK DIAGRAM

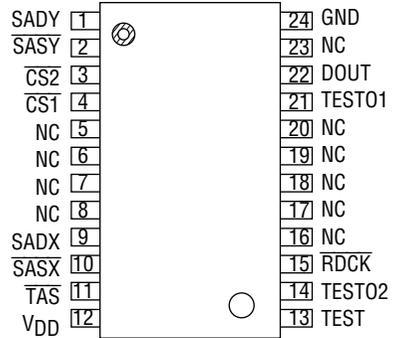


PIN CONFIGURATIONS (TOP VIEW)



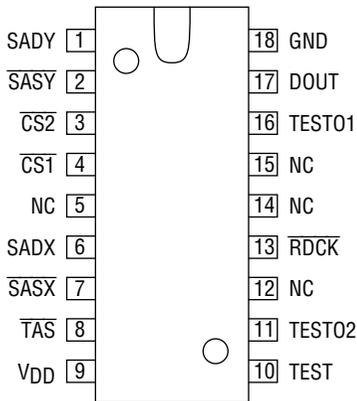
NC: No connection

18-Pin Plastic QFJ



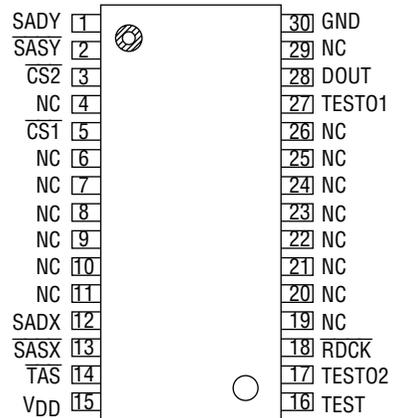
NC: No connection

24-Pin Plastic SOP



NC: No connection

18-Pin Plastic DIP



NC: No connection

30-Pin Plastic SSOP

PIN DESCRIPTIONS

Pin				Symbol	Type	Description
QFJ	SOP	DIP	SSOP			
9	12	9	15	V _{DD}	—	Power supply pin. Insert a bypass capacitor of 0.1 μF or more between this pin and the GND pin.
18	24	18	30	GND	—	Ground pin
6	9	6	12	SADX	I	(SERIAL ADDRESS) This pin inputs the starting X address of a read operation. Addressing in units of 1024 words is possible. The 1024-word address data can be input as 10-bit (AX0 - AX9) serial data via the SADX pin.
1	1	1	1	SADY	I	(SERIAL ADDRESS) This pin inputs the starting Y address of a read operation. Addressing in units of 1024 words is possible. The 1024-word address data can be input as 10-bit (AY0 - AY9) serial data via the SADY pin.
7	10	7	13	$\overline{\text{SASX}}$	I	(SERIAL ADDRESS STROBE) This is the clock input pin which is used to store the serial address data of the X address into the device's internal register.
2	2	2	2	$\overline{\text{SASY}}$	I	(SERIAL ADDRESS STROBE) This is the clock input pin which is used to store the serial address data of the Y address into the device's internal register.
8	11	8	14	$\overline{\text{TAS}}$	I	(TRANSFER ADDRESS STROBE) This is the input pin for loading the serial address data into the internal address counter. The X and Y addresses are stored at the falling edge of $\overline{\text{TAS}}$.
13	15	13	18	$\overline{\text{RDCK}}$	I	(READ CLOCK) This is the clock input pin for reading information out of the data register. Internal operation starts at the falling edge of $\overline{\text{RDCK}}$. The information in the data register is output on the DOUT pin. The internal address counter is automatically incremented at the falling edge of $\overline{\text{RDCK}}$.
17	22	17	28	DOUT	O	(DATA OUT) The data output pin is always kept in a high-impedance state when $\overline{\text{RDCK}}$ or $\overline{\text{CS}}$ is kept "H". This pin reflects the "H" or "L" level data being read, and the current data is hold until $\overline{\text{ROCK}}$ is asserted "H".
4	4	4	5	$\overline{\text{CS1}}$	I	(CHIP SELECT) When CS1 is set to "L", bank 1 is selected. When CS2 is set to "L", bank 2 is selected. Setting both CS1 and CS2 to "H" disables all input and output pins. These pins enable parallel use of multiple serial voice ROMs by connecting the data output pins.
3	3	3	3	$\overline{\text{CS2}}$		
10	13	10	16	TEST	I	Pin for testing. Apply a "L" level.
16	21	16	27	TESTO1	O	Pins for testing. Leave these pins open.
11	14	11	17	TESTO2		

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Rating	Unit
Power Supply Voltage	V _{DD}	T _a = 25°C	-0.3 to +7.0	V
Input Voltage	V _{IN}	T _a = 25°C	-0.3 to V _{DD} +0.3	V
Storage Temperature	T _{STG}	—	-55 to +150	°C

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Condition	Range	Unit
Power Supply Voltage	V_{DD}	GND=0 V	2.7 to 5.5	V
Operating Temperature	T_{op}	—	-40 to +85	°C

ELECTRICAL CHARACTERISTICS

DC Characteristics

$V_{DD} = 2.7$ to 5.5 V, $T_a = -40$ to $+85^\circ\text{C}$

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	
"H" Level Input Voltage	V_{IH}	—	$0.85 \times V_{DD}$	—	—	V	
"L" Level Input Voltage	V_{IL}	—	—	—	$0.15 \times V_{DD}$	V	
"H" Level Output Voltage	V_{OH}	$I_{OH} = -40 \mu\text{A}$	$V_{DD} - 0.3$	—	—	V	
"L" Level Output Voltage	V_{OL}	$I_{OL} = 2 \text{ mA}$	—	—	0.45	V	
"H" Level Input Current	I_{IH}	$V_{IH} = V_{DD}$	—	—	10	μA	
"L" Level Input Current	I_{IL}	$V_{IL} = \text{GND}$	-10	—	—	μA	
Current Consumption (1)	I_{DD}	$t_{RDC} = 2.5 \mu\text{s}$	—	9	20	mA	
Current Consumption (2)	I_{DS}	$\overline{CS1} = \overline{CS2} = V_{DD} - 0.2 \text{ V}$	$T_a = -40$ to $+70^\circ\text{C}$	—	—	10	μA
			$T_a = -40$ to $+85^\circ\text{C}$	—	—	50	

Typical values are at $V_{DD} = 5.0$ V, $T_a = 25^\circ\text{C}$.

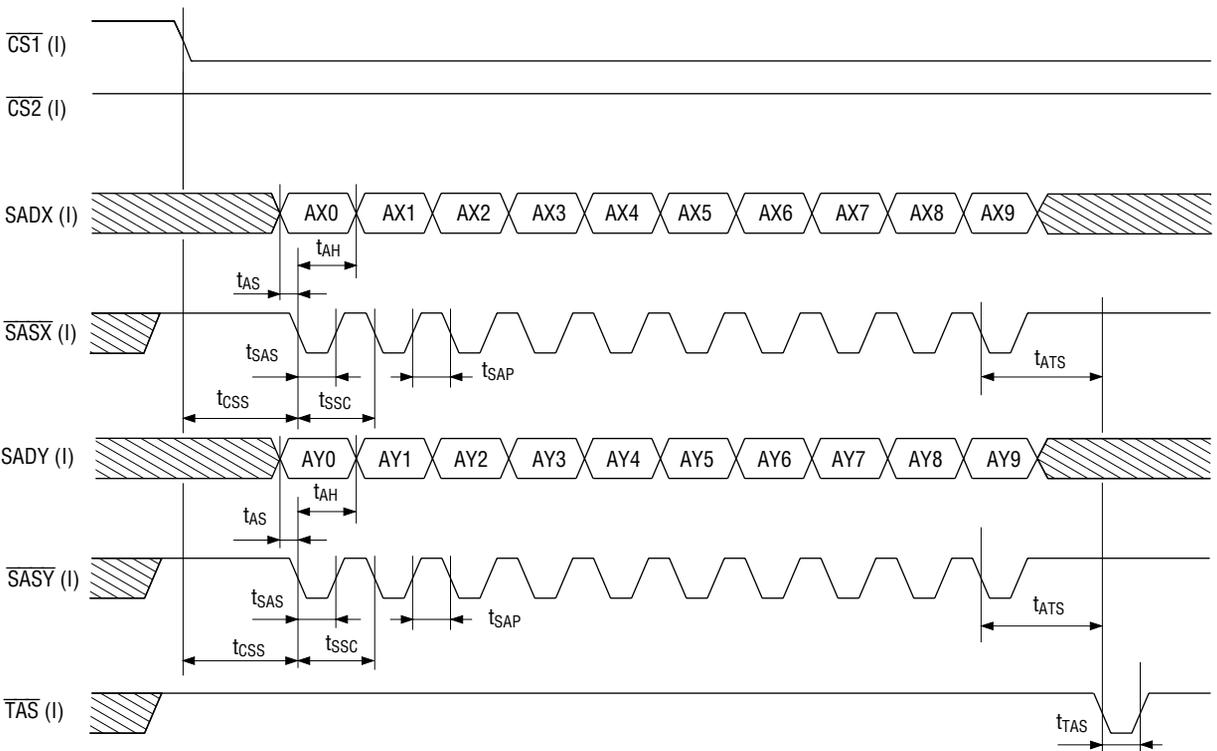
AC Characteristics

$V_{DD} = 2.7$ to 5.5 V, $T_a = -40$ to $+85^\circ\text{C}$

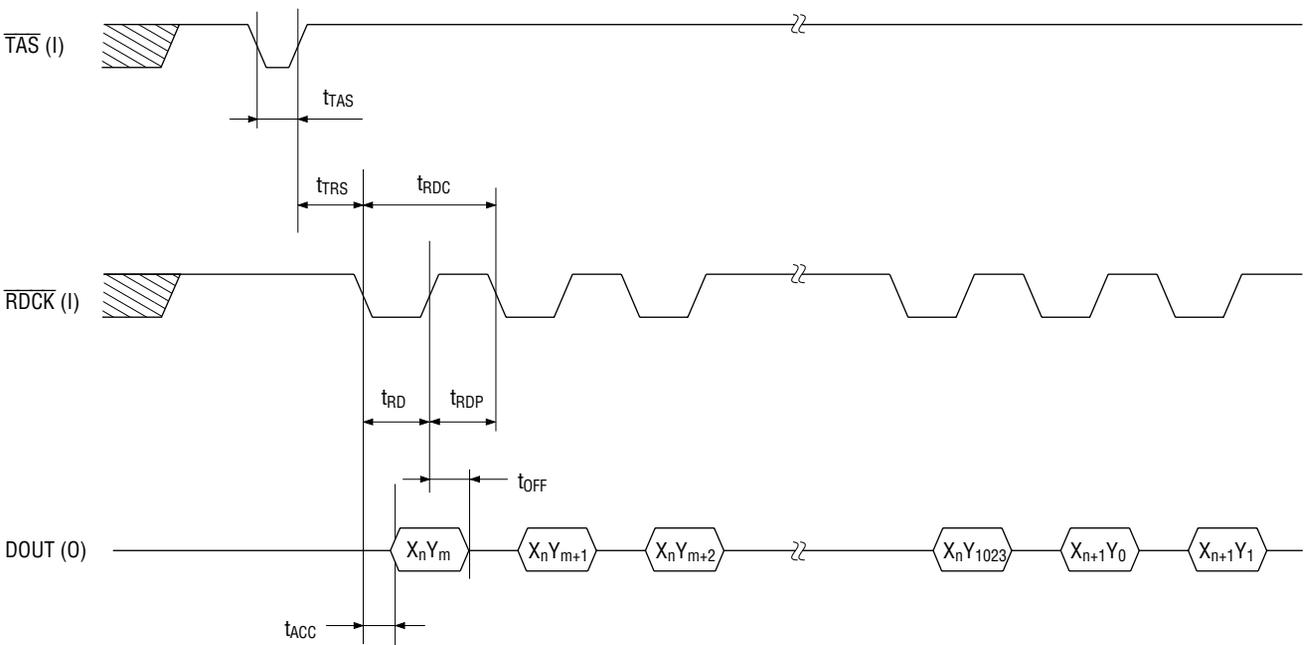
Parameter	Symbol	Min.	Max.	Unit
\overline{CS} , \overline{SAS} Setup Time	t_{CSS}	1000	—	ns
\overline{SASX} , \overline{SASY} Cycle Time	t_{SSC}	500	—	ns
\overline{SASX} , \overline{SASY} Precharge Time	t_{SAP}	250	—	ns
\overline{SASX} , \overline{SASY} Pulse Width	t_{SAS}	250	—	ns
Address Setup Time	t_{AS}	100	—	ns
Address Hold Time	t_{AH}	100	—	ns
\overline{TAS} Setup Time	t_{ATS}	500	—	ns
\overline{TAS} , \overline{RDCK} Setup Time	t_{TRS}	500	—	ns
\overline{TAS} Pulse Width	t_{TAS}	250	—	ns
Read Cycle Time	t_{RDC}	2500	—	ns
Access Time	t_{ACC}	—	1500	ns
Output Turn-off Delay Time	t_{OFF}	0	200	ns
\overline{RDCK} Precharge Time	t_{RDP}	1000	—	ns
\overline{RDCK} Pulse Width	t_{RD}	1500	—	ns

TIMING DIAGRAMS

Serial Address Input Timing

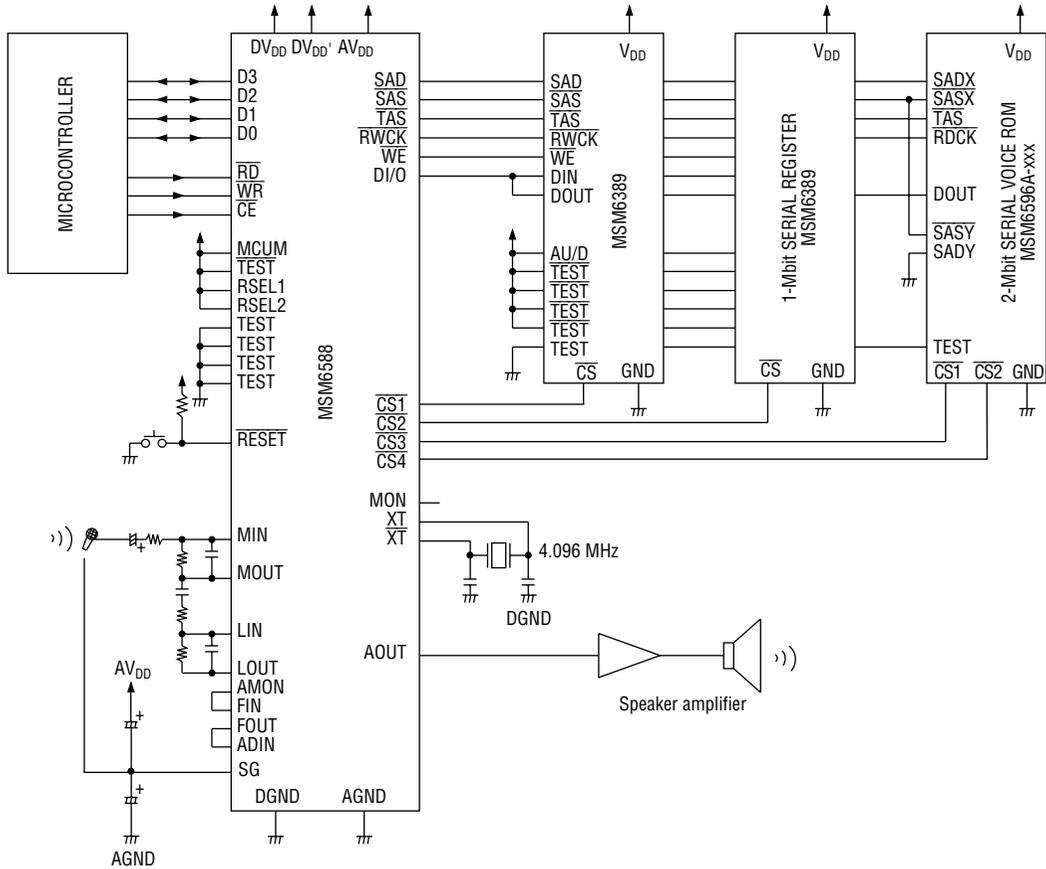


Read Access Timing



APPLICATION CIRCUIT

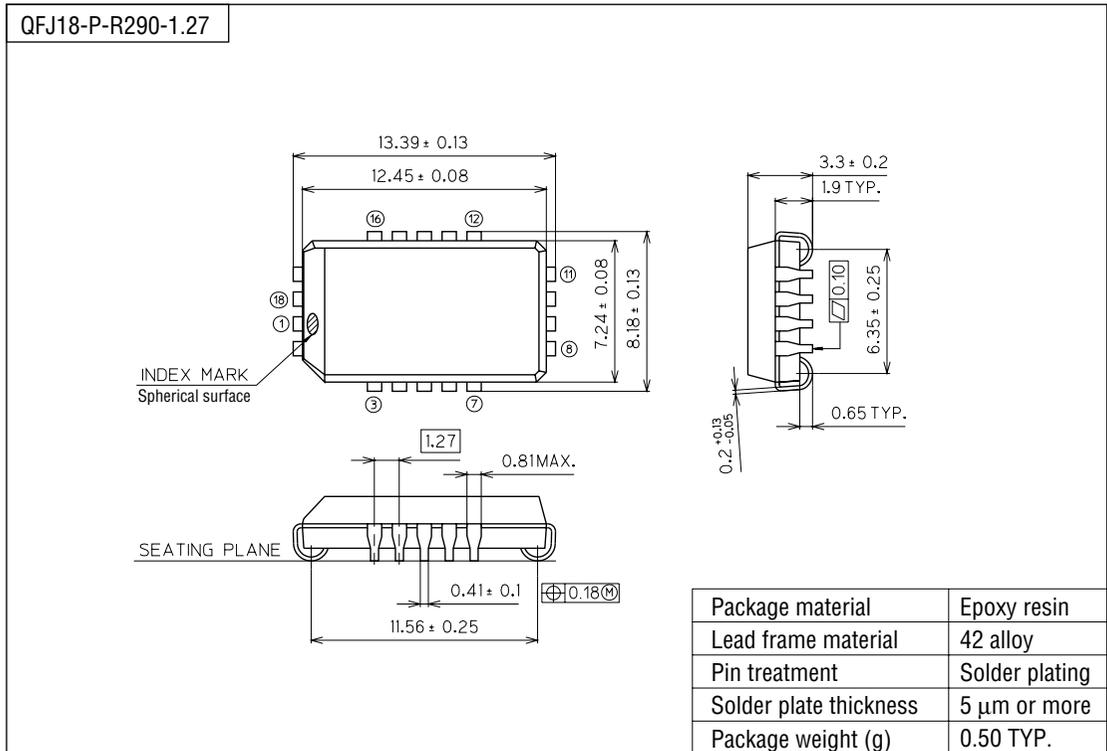
MSM6588 Playback Storage Example



Note: When the MSM6596A is driven by the MSM6388 or MSM6588, a serial register is required. (The MSM6596A does not operate without it.) The MSM6389 is being used as the serial register in the above example.

PACKAGE DIMENSIONS

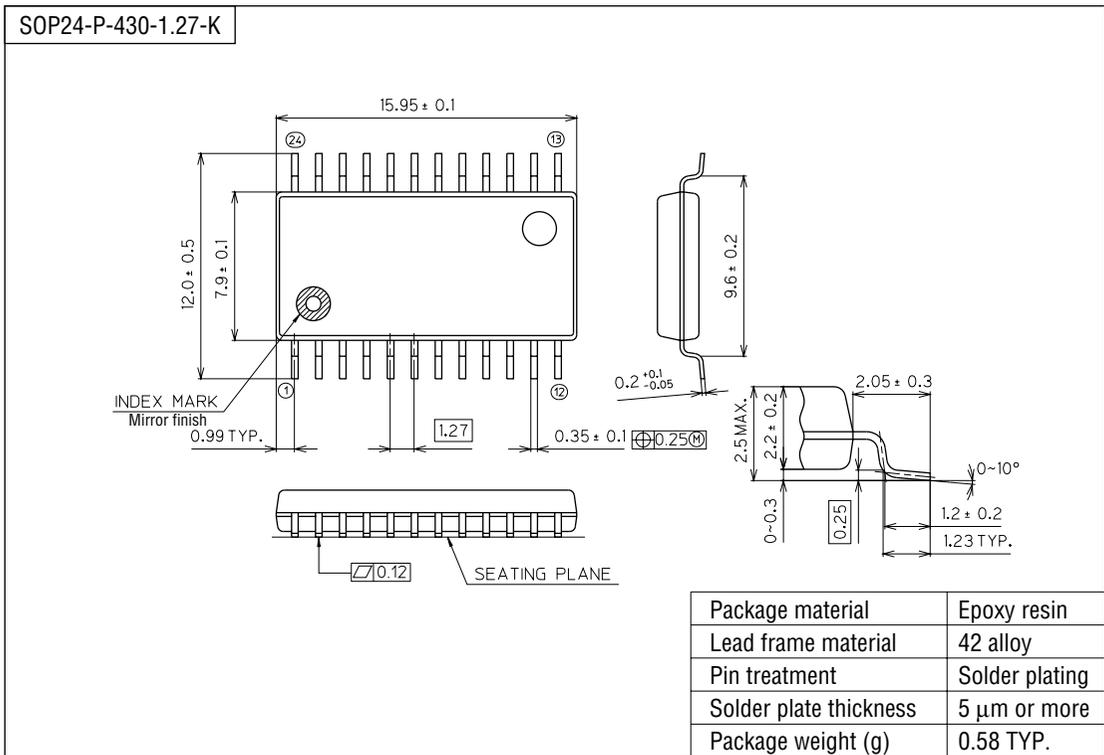
(Unit : mm)



Notes for Mounting the Surface Mount Type Package

The SOP, QFP, TSOP, TQFP, LQFP, SOJ, QFJ (PLCC), SHP, and BGA are surface mount type packages, which are very susceptible to heat in reflow mounting and humidity absorbed in storage. Therefore, before you perform reflow mounting, contact Oki's responsible sales person on the product name, package name, pin number, package code and desired mounting conditions (reflow method, temperature and times).

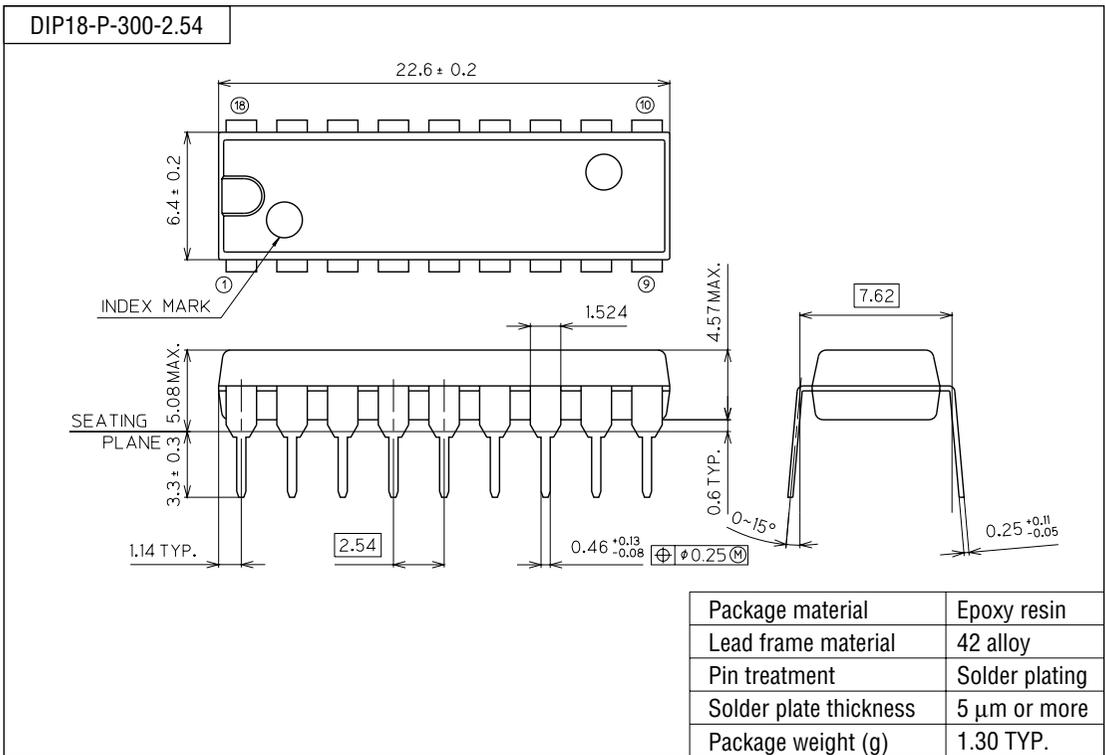
(Unit : mm)



Notes for Mounting the Surface Mount Type Package

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(Unit : mm)



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