OKI Semiconductor

This version: Feb. 1999
Previous version: May. 1997

MSM6595A-xxx

1-Mbit Serial Voice ROM

GENERAL DESCRIPTION

The MSM6595A is a MSM6595 short TAT process version.
The MSM6595A is a serial voice ROM with a 1,048,576-word × 1-bit configuration.
The MSM6595A 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. A read and playback device with predetermined messages can easily be configured by storing voice data into the MSM6595A and by combining it with one of Oki's recording and playback ICs and a serial register IC.

A serial register is required to drive the MSM6595A by the MSM6388 or MSM6588. (The MSM6595A does not operate without a serial register.)

The major differences between the MSM6595A and MSM6595 are shown below.

MSM6595A DC Characteristics

V_{DD} = 2.7 to 5.5 V, Ta = –40 to +85°C

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Current consumption (1)	I_{DD}	t_{RDC} = 2.5 µs		—	9	20	mA
Current consumption (2)	I_{DS}	$\overline{CS}$ = V_{DD}–0.2 V	Ta = –40 to +70°C	—	—	10	µA
			Ta = –40 to +85°C	—	—	50	

Typical values are at V_{DD} = 5.0 V, Ta = 25°C.

MSM6595 DC Characteristics

V_{DD} = 3.5 to 5.5 V, Ta = –40 to +85°C

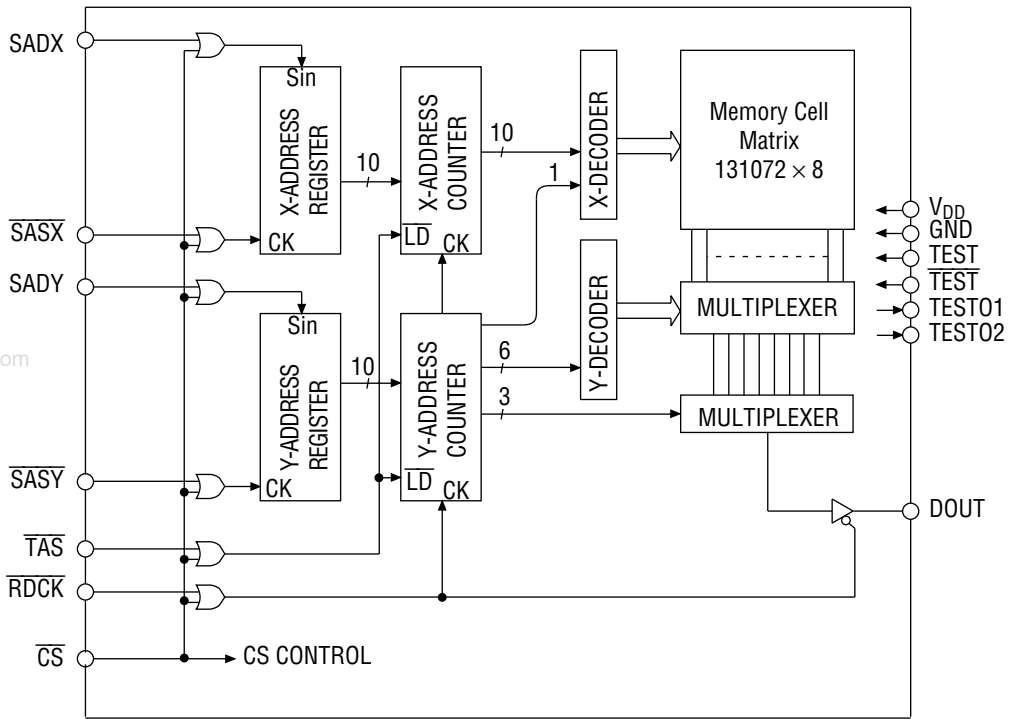
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Current consumption (1)	I_{DD}	t_{RDC} = 2.5 µs	—	—	15	mA
Current consumption (2)	I_{DS}	$\overline{CS}$ = V_{DD}–0.2 V	—	—	10	µA

FEATURES

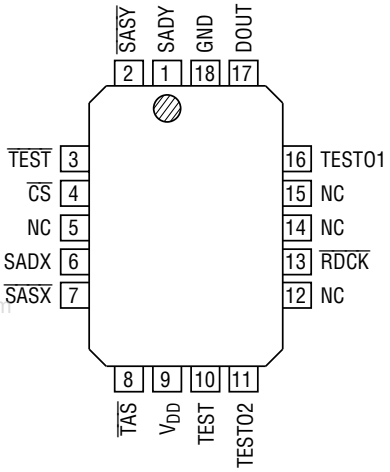
- Configuration : 1,048,576 words × 1 bit
- Serial access : Read cycle time of 2.5 µs
- Shorter-TAT processing
- Power-supply voltage : 2.7 to 5.5 V
- Package options :
  - 18-pin plastic QFJ (QFJ18-P-R290-1.27) (Product Name : MSM6595A-xxxJS)
  - 24-pin plastic SOP (SOP24-P-430-1.27-K) (Product Name : MSM6595A-xxxGS-K)
  - 18-pin plastic DIP (DIP18-P-300-2.54) (Product name : MSM6595A-xxxRS)
  - 30-pin plastic SSOP (SSOP30-P-56-0.65-K) (Product name : MSM6595A-xxxGS-AK)

xxx indicates the code number

BLOCK DIAGRAM

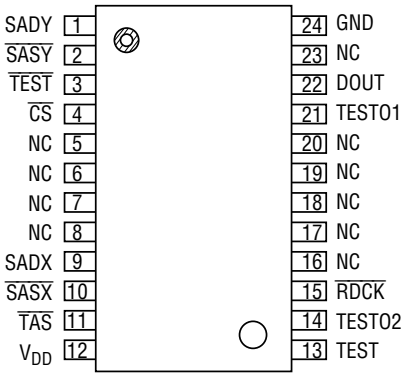


PIN CONFIGURATIONS (TOP VIEW)



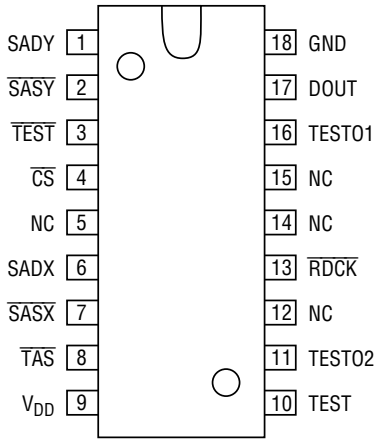
NC : No connection

18-Pin Plastic QFJ



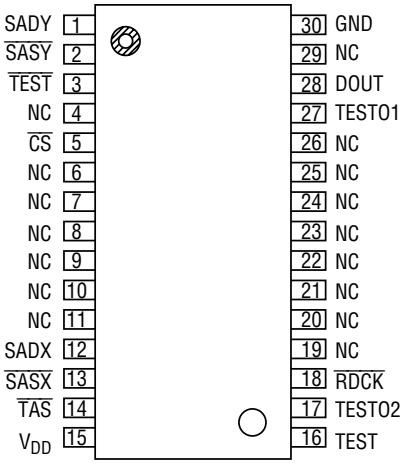
NC : No connection

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	$\overline{SASX}$	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	$\overline{SASY}$	I	(SERIAL ADDRESS STROBE) This is the clock input pin to store the serial address data of the Y address into the device's internal register.
8	11	8	14	$\overline{TAS}$	I	(ADDRESS TRANSFER 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 $\overline{TAS}$.
13	15	13	18	$\overline{RDCK}$	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 $\overline{RDCK}$. The information in the data register is output on the DOUT pin. The internal address counter is automatically incremented at the falling edge of $\overline{RDCK}$.
17	22	17	28	DOUT	O	(DATA OUT) The data output pin is always kept in a high-impedance state when $\overline{RDCK}$ or $\overline{CS}$ is kept at "H". This pin reflects the "H" or "L" level data being read, and the current data is held until $\overline{RDCK}$ is asserted High.
4	4	4	5	$\overline{CS}$	I	(CHIP SELECT) Setting this pin to "H" disables all input and output pins. This pin enables parallel use of multiple serial voice ROMs by connecting the data output pins.
10	13	10	16	TEST	I	Pins for testing. Apply a "L" level to the TEST pin and "H" level to the $\overline{TEST}$ pin.
3	3	3	3	$\overline{TEST}$		
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}	Ta = 25°C	–0.3 to +7.0	V
Input Voltage	V_{IN}	Ta = 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, Ta = –40 to +85°C

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
"H" Level Input Voltage	V_{IH}	—		0.85xV_{DD}	—	—	V
"L" Level Input Voltage	V_{IL}	—		—	—	0.15xV_{DD}	V
"H" Level Output Voltage	V_{OH}	I_{OH} = –40 µA		V_{DD}–0.3	—	—	V
"L" Level Output Voltage	V_{OL}	I_{OL} = 2 mA		—	—	0.45	V
"H" Level Input Current	I_{IH}	V_{IH} = V_{DD}		—	—	10	µA
"L" Level Input Current	I_{IL}	V_{IL} = GND		–10	—	—	µA
Current Consumption (1)	I_{DD}	t_{RDC} = 2.5 µs		—	9	20	mA
Current Consumption (2)	I_{DS}	$\overline{CS}$ = V_{DD}–0.2 V	Ta = –40 to +70°C	—	—	10	µA
			Ta = –40 to +85°C	—	—	50	

Typical values are at V_{DD} = 5.0 V, Ta = 25°C.

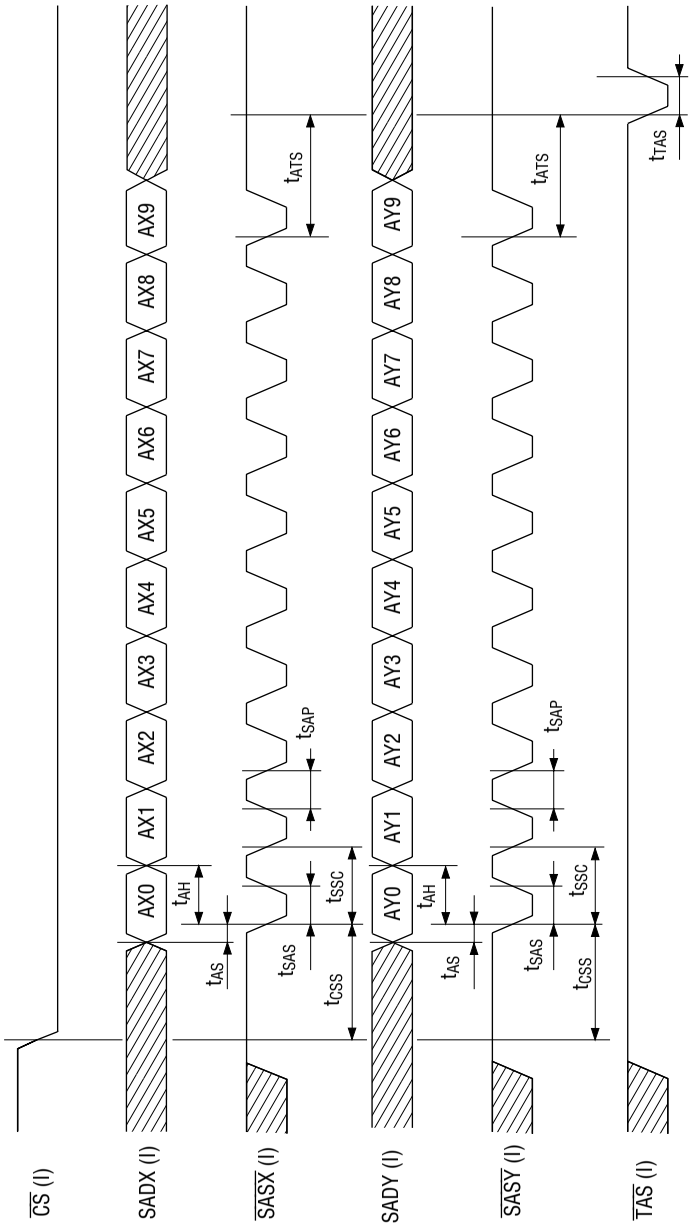
AC Characteristics

V_{DD} = 2.7 to 5.5 V, Ta = –40 to +85°C

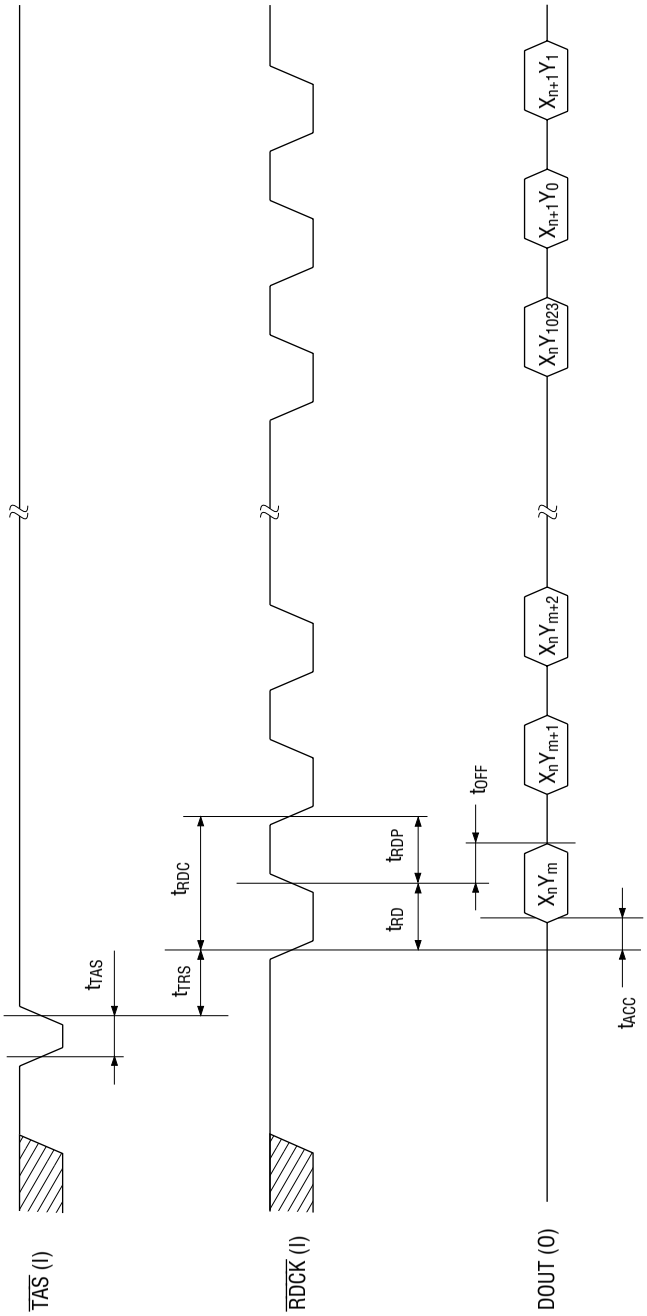
Parameter	Symbol	Min.	Max.	Unit
$\overline{CS}$, $\overline{SAS}$ Setup Time	t_{CSS}	1000	—	ns
$\overline{SASX}$, $\overline{SASY}$ Cycle Time	t_{SSC}	500	—	ns
$\overline{SASX}$, $\overline{SASY}$ Precharge Time	t_{SAP}	250	—	ns
$\overline{SASX}$, $\overline{SASY}$ Pulse Width	t_{SAS}	250	—	ns
Address 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

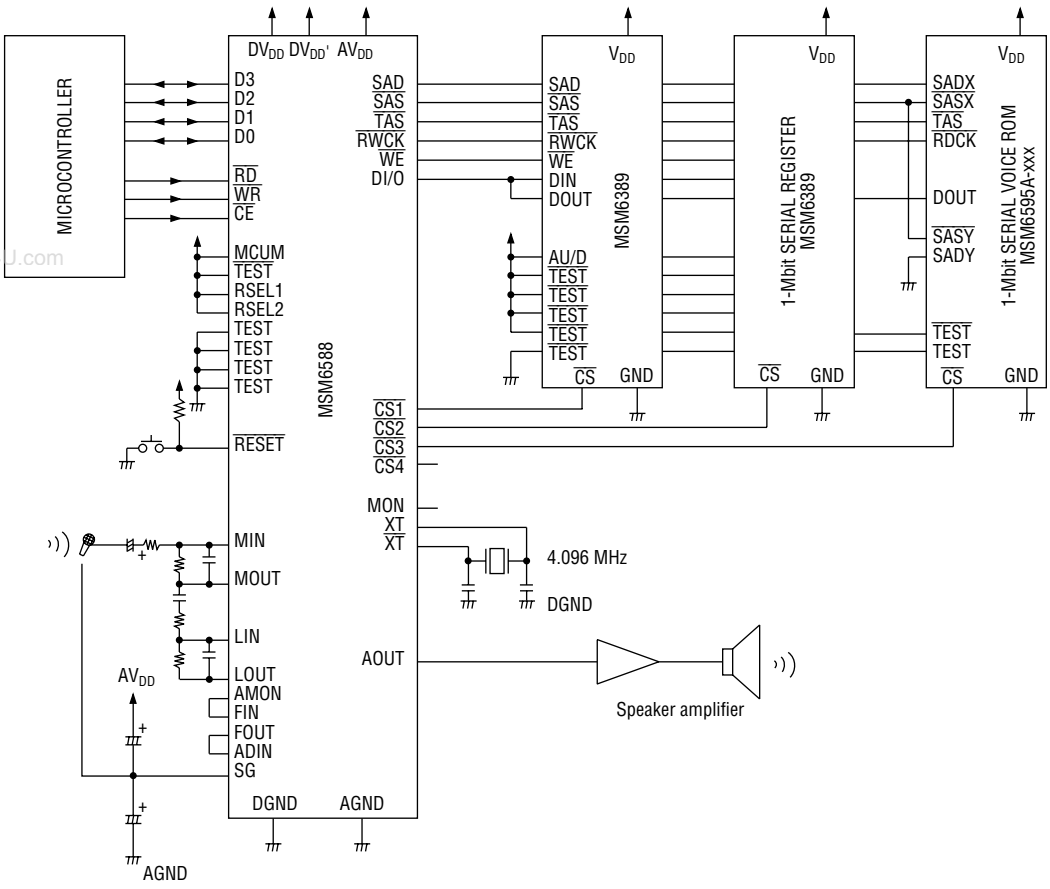


Read Access Timing



APPLICATION CIRCUIT

MSM6588 Playback Storage Example

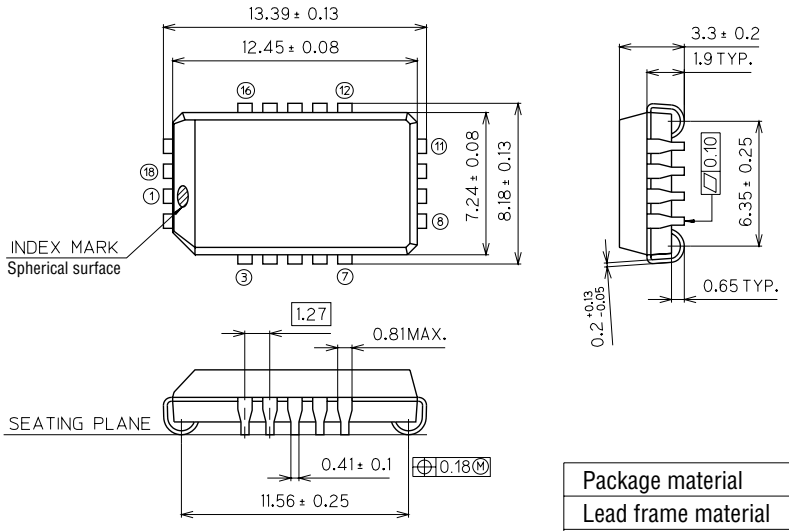


Note: When the MSM6595A is driven by the MSM6388 or MSM6588, a serial register is required. (The MSM6595A does not operate without it.) The MSM6389 is being used as the serial register in the above example.

PACKAGE DIMENSIONS

(Unit : mm)

QFJ18-P-R290-1.27



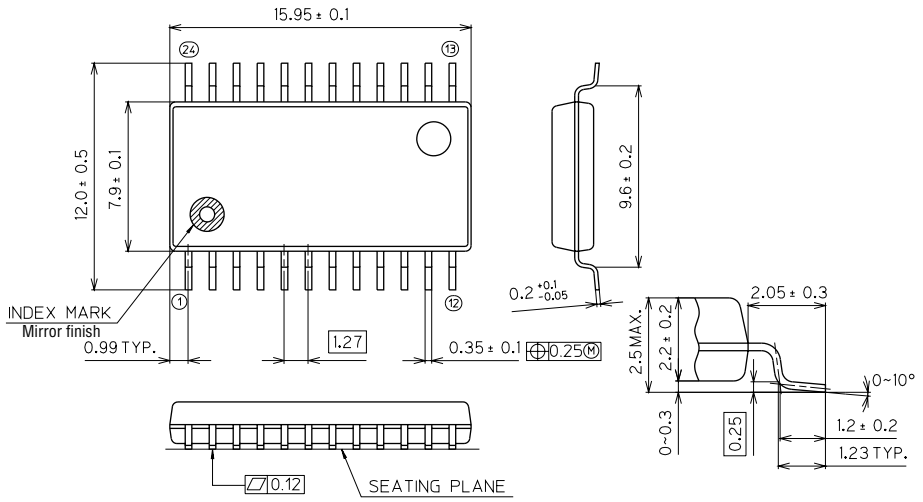
Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating
Solder plate thickness	5 μm or more
Package weight (g)	0.50 TYP.

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)

SOP24-P-430-1.27-K



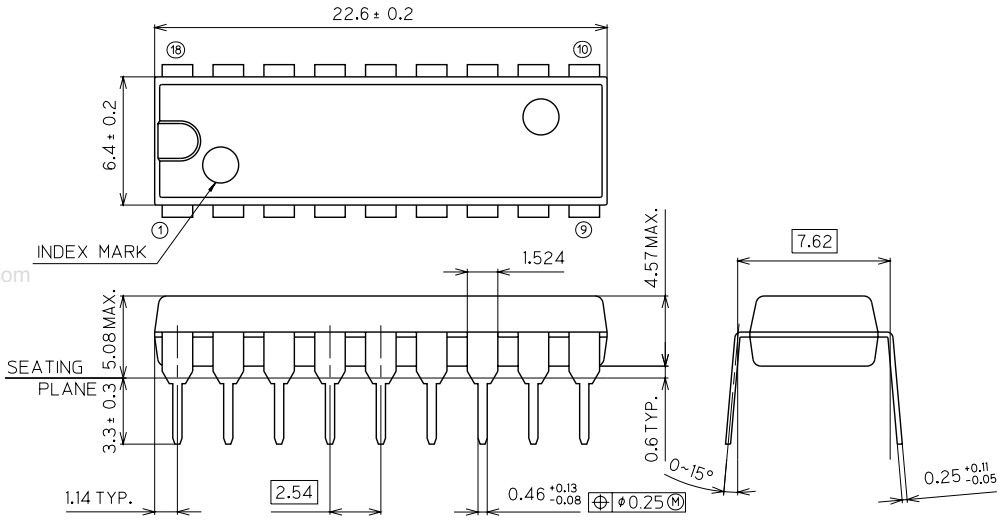
Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating
Solder plate thickness	5 μm or more
Package weight (g)	0.58 TYP.

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)

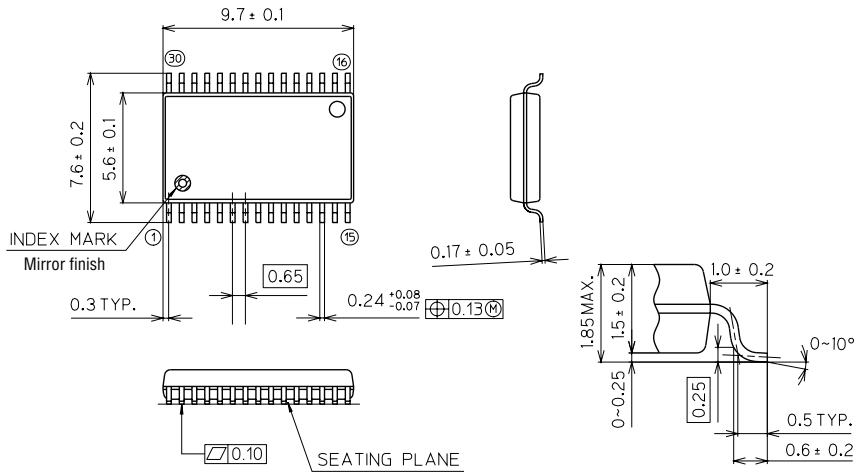
DIP18-P-300-2.54



Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating
Solder plate thickness	5 μm or more
Package weight (g)	1.30 TYP.

(Unit : mm)

SSOP30-P-56-0.65-K



Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating
Solder plate thickness	5 μm or more
Package weight (g)	0.19 TYP.

Notes for Mounting the Surface Mount Type Package

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