FEDL6585-03
Issue Date: Aug. 25, 2004

OKI Semiconductor

MSM6585

ADPCM Voice Synthesis IC

GENERAL DESCRIPTION

The MSM6585 is an version-up product of the MSM5205 voice synthesis IC. Mainly improved points are improvement for the precision of an internal DA converter, a built-in low-pass filter, and expansion on the sampling frequency. The MSM6585 does not include a control circuit to drive an external memory similar to the MSM5205. Therefore, the MSM6585 can be connected with not only semiconductor memories, but other memory media (CD-ROM, etc.) by the control of CPU.

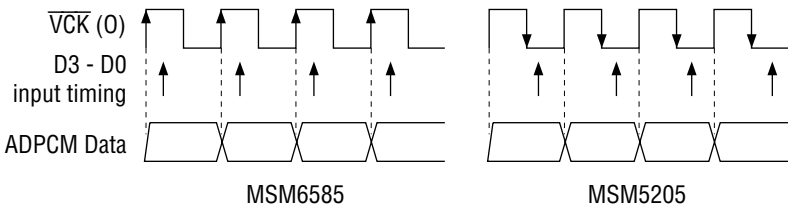
FEATURES

- 4-bit ADPCM method
- Built-in 12-bit DA converter
- Built-in low-pass filter (LPF) (–40dB/oct)
- Sampling frequencies: 4k/8k/16k/32kHz
- Master clock frequency (ceramic oscillator) : 640kHz
- Voice data synthesis: Supported by voice analysis editing tool AR207
- Package options:
  18-pin plastic DIP (DIP18-P-300-2.54) (MSM6585RS)
  24-pin plastic SOP (SOP24-P-430-1.27-K) (MSM6585MAZXXX)
  30-pin plastic SSOP (SSOP30-P-56-0.65-K) (MSM6585MBZXXX)

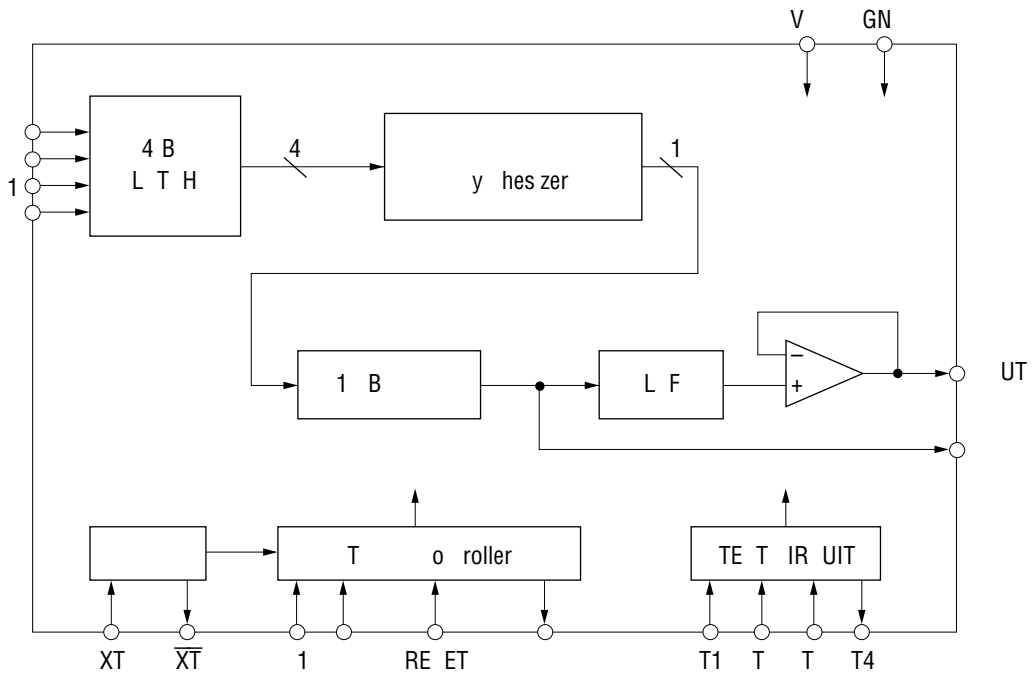
DIFFERENCES BETWEEN MSM6585 AND MSM5205

	MSM6585	MSM5205
• Master clock frequency:	640kHz	384kHz
• Sampling frequency:	4k/8k/16k/32kHz	4k/6k/8kHz
• ADPCM bit length:	4-bit	3-bit/4-bit
• DA Converter:	12-bit	10-bit
• Low-pass filter:	Included (–40dB/oct)	Not included
• Overflow preventing circuit:	Included	Not included
• Power supply voltage:	4.5 to 5.5V	3.0 to 6.0V
• Operating current consumption:	10mA	4mA
• Operating temperature:	–40 to +85°C	–30 to +70°C

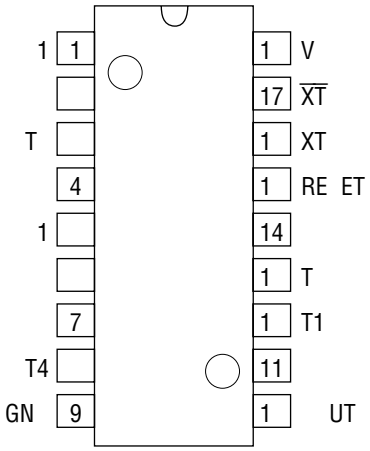
• D3 to D0 input timing



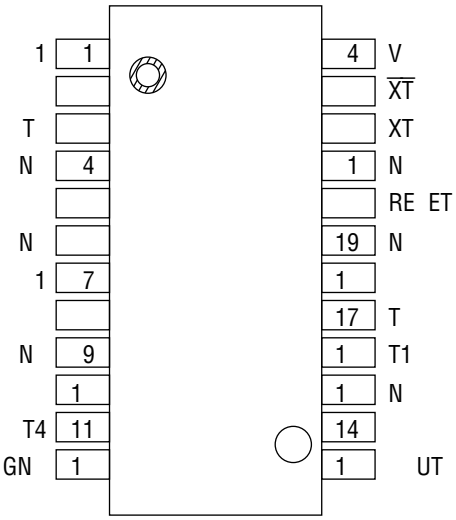
K


V
GN
1
4 B
L T H
4
y hes zer
1
1 B
L F
UT
T o roller
TE T IR UIT
XT
XT
1
RE ET
T1
T
T
T4

(V)

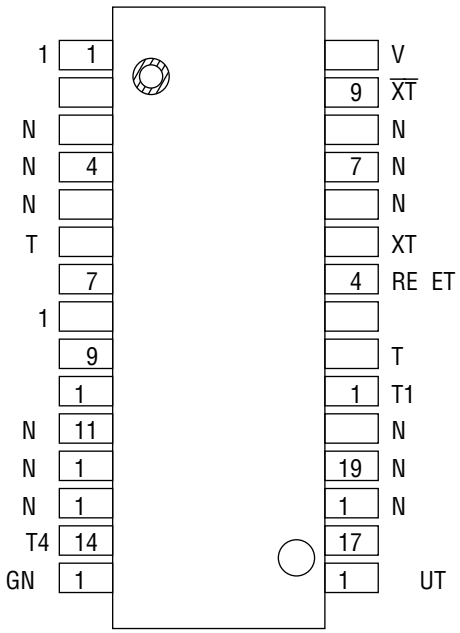


1 - in lastic



N : No co ec o

4- in lastic



N : No co ec o

3 - in lastic

in			ymbol	ype	escription
1	1	1	1	I	s o de er e he s l freq e cy. The s l freq e c es of k, 1 k, k, d 4kHz c be selec ed by co b o s. ee he s l freq e c es FUN TI N L E RI TI N o he selec o of co b o s.
			T	I	o es he er l c rc . e h s o h h level or ke o e bec se h s b l ll res s or.
4 7	, 7, , 1	7 1		I	l s for d . o es he er l c rc . ke h s o e .
	11	14	T4		o es he er l c rc . ke h s o e .
9	1	1	GN	—	Gro d
1	1	1	UT		o o he lo vo ce fro he low ss f l er. o ec . 1 µF c c or o h s . ee he UT co ec c rc FUN TI N L E RI TI N o he co ec c rc .
11	14	17			o o he lo vo ce fro he co ver er.
1	1	1	T1	I	s o es he er l c rc . e hese s o low level or ke he
1	17		T		o e bec se ll dow res s ors re cl ded.
14	1				Th s o s he s l freq e cy selec ed by he co b o s of 1 d . The vo ce sy hes s s r s or s o s by sy chro z w h .
1		4	RE ET	I	Rese . The vo ce sy hes s c rc s l zed by sy chro z w h . If h s s se o h h level, he o d s re d s bled by sy chro z w h . The UT d s o 1/ V d beco e he s e of o vo ce.
1			XT	I	o co ec osc ll or. Whe he ex er l clock s sed, fro h s .
17		9	$\overline{XT}$		o co ec osc ll or. Whe he ex er l clock s sed, ke h s o e .
1	4		V	—	ower s ly . l ser by ss c c or of .1 µF or ore be wee h s d he GN .

X

GN = V

arameter	ymbol	ondition	ating	nit
ower ly Vol e	V	T = °	– . o +7.	V
I Vol e	V_{IN}	T = °	– . o V + .	V
or e Te er re	T_{TG}	—	– o +1	°

GN = V

arameter	ymbol	ondition	ange	nit
ower ly Vol e	V	—	4. o .	V
er Te er re	T_o	—	–4 o +	°
s er lock Freq e cy	f	osc ll or co ec o	4	kHz

H

haracteristics

V =4. o . V, GN = V, T =–4 o + °

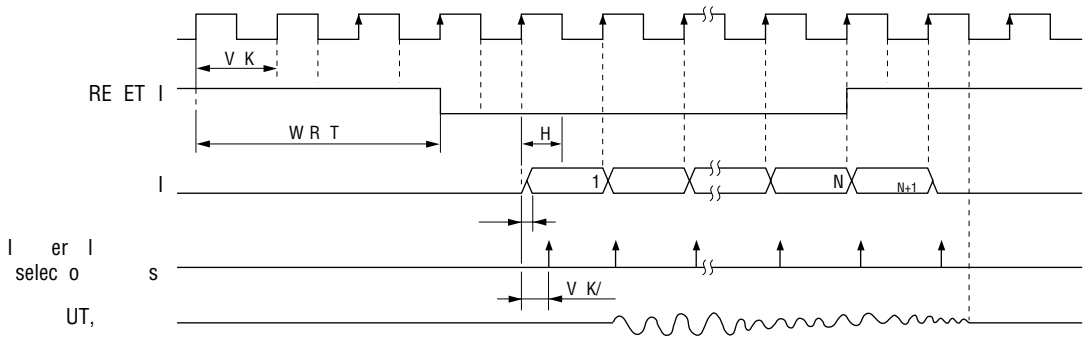
arameter	ymbol	ondition	in.	yp.	ax.	nit
"H" l Vol e	V_{IH}	—	. ×V	—	V + .1	V
"L" l Vol e	V_{IL}	—	– .1	—	. ×V	V
"H" Vol e	V_{H}	V K: I H = –4 µ	V – .4	—	—	V
"L" Vol e	V_{L}	V K: I L = 4 µ	—	—	.4	V
"H" l rre	I_{IH1}	T1, T , RE ET: V_{IH} = V		1	4	µ
"H" l rre	I_{IH}	1, , , T : V_{IH} = V	—	—	1	µ
"H" l rre	I_{IH}	XT: V_{IH} = V	—	—		µ
"L" l rre	I_{IL1}	T : V_{IL} = V	–4	–1	–	µ
"L" l rre	I_{IL}	1, , , T1, T , RE ET: V_{IL}= V	–1	—	—	µ
"L" l rre	I_{IL}	XT=V_{IL}= V	–	—	—	µ
rre o s o	I	f_{OSC}= 4 kHz, No lo d	—		1	
Rel ve Error	l V E l	No lo d	—	—	4	V
l ed ce	R	—	1	—	4	kΩ
L F Lo d Res s ce	R UT	—		—	—	kΩ

haracteristics

arameter	ymbol	ondition	in.	yp.	ax.	nit
r l sc ll o y ycle	$f_{d\ y}$	—	4			%
RE ET I lse W d h	W R T	f = 4kHz ··· V K = µs = kHz ··· = 1 µs =1 kHz ··· = . µs = kHz ··· = 1. µs	×V K	—	—	µs
e T e			—	—		µs
Hold T e	H		V K/	—	—	µs

W

E E E E WEE

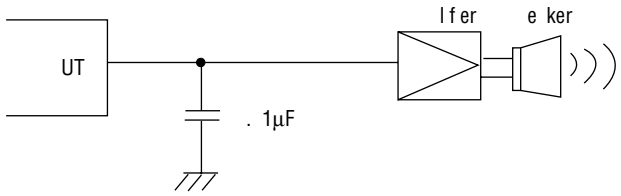


$\overline{VCK}$

E E E E WEE

1		ampling frequency (f)	utoff frequency (f)
L	L	4 kHz	1. kHz
H	L	kHz	. kHz
L	H	1 kHz	.4 kHz
H	H	kHz	1 . kHz

μ



E μ

W

9 9 ×

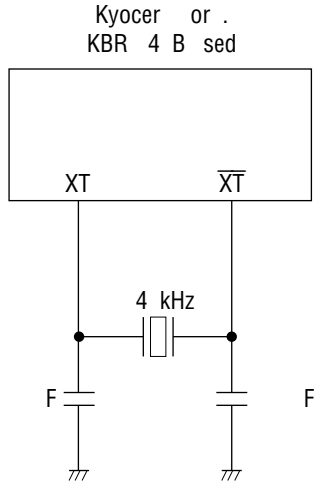
Ω Ω

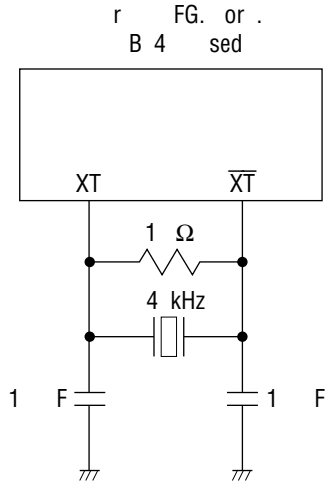

f c or dB
–
–4
–
1
1k
1 k
Freq e cy Hz

K

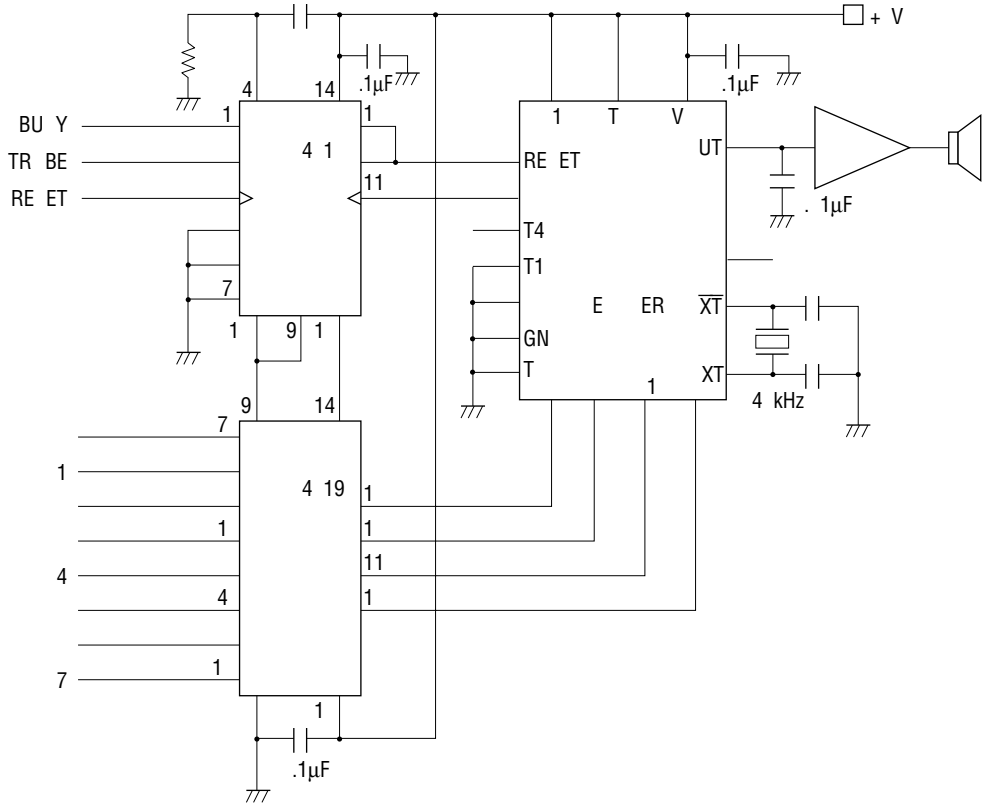
K

G


Kyocer or .
KBR 4 B sed
XT
XT
4 kHz
F
F


r FG. or .
B 4 sed
XT
XT
1 Ω
4 kHz
1 F
1 F

entronics nterface ircuit (sampling frequency : kHz)



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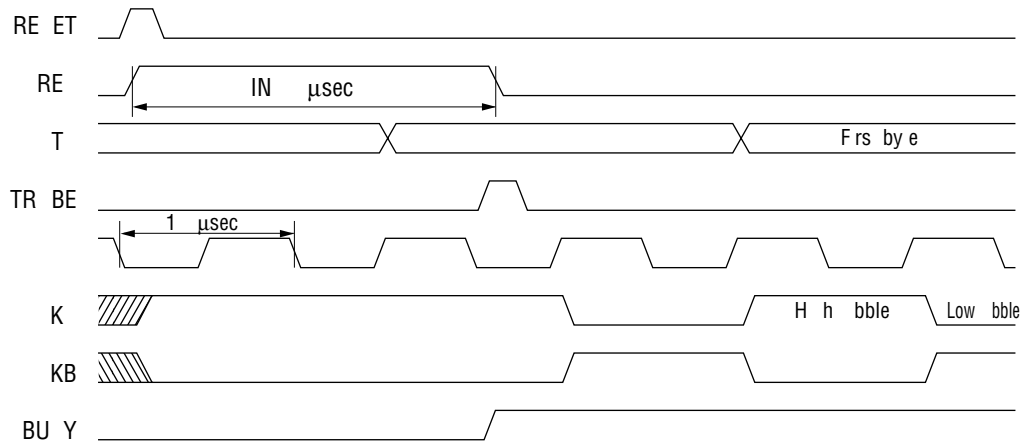
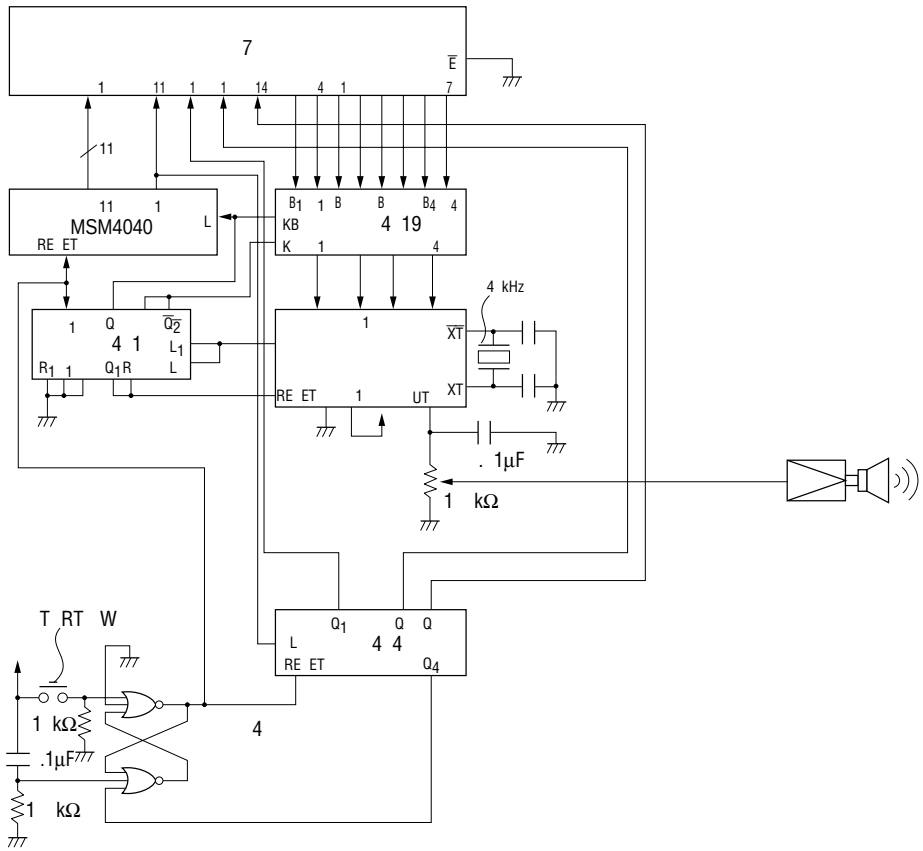
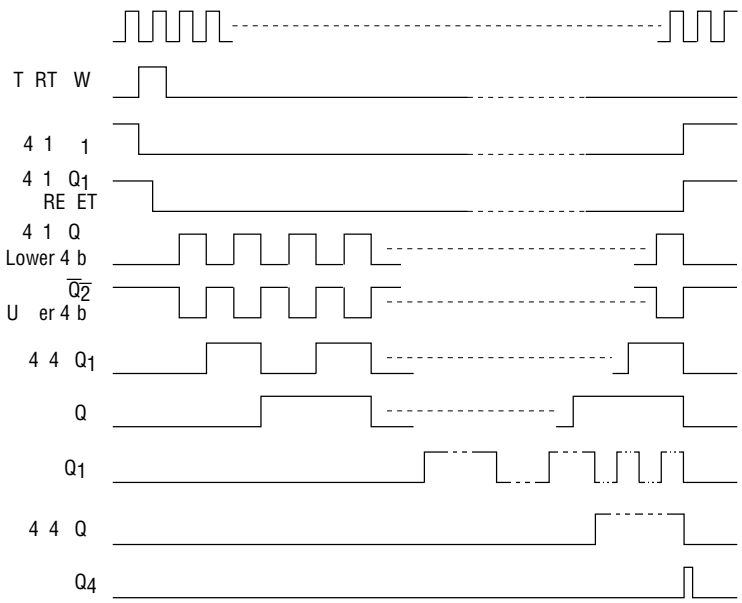


xample of nterface ircuit with K-bit

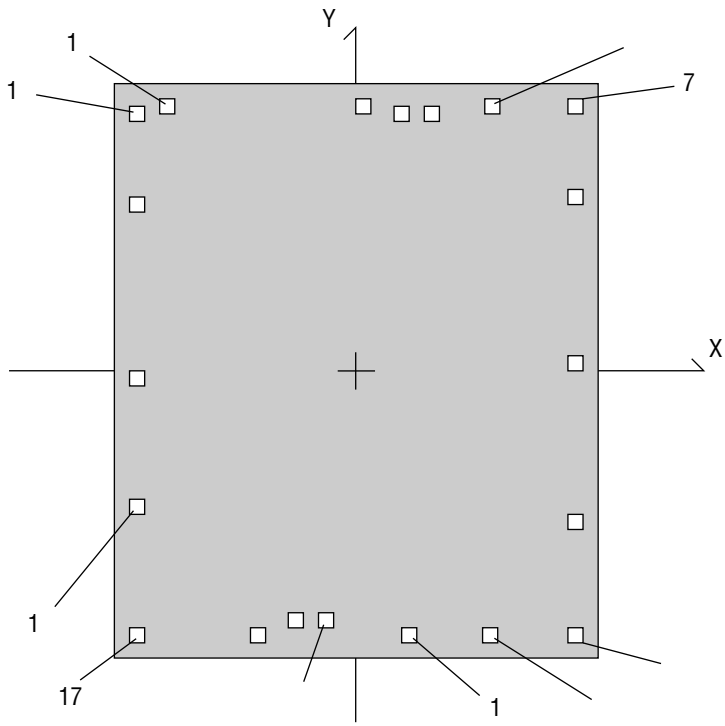
K E





ad ayout

× = 9 Y =
μ ± μ
μ × μ
G



ad oordiantes

X= Y=

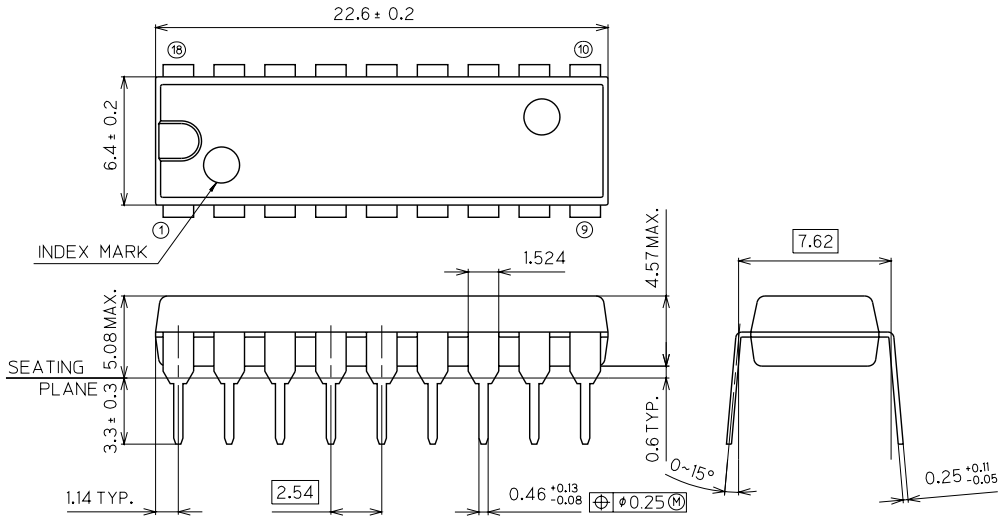
U : μ

o.	ame	X-axis	Y-axis	o.	ame	X-axis	Y-axis
1	1	77	–1	11	UT		1
		19	–1	1		–11	1
	T	1	–1	1	T1	–1	1 79
4		1	–94	14	T	–1	1 9
	1	1	44	1		–1	–
		1	1 9	1	RE ET	–1	– 1
7		1	1	17	XT	–1 1	–1
	T4		1	1	$\overline{\text{XT}}$	– 9	–1
9	V	447	1	19	V	– 99	–1 49
1	V	7	1		V	–119	–1 49

K

(Unit : mm)

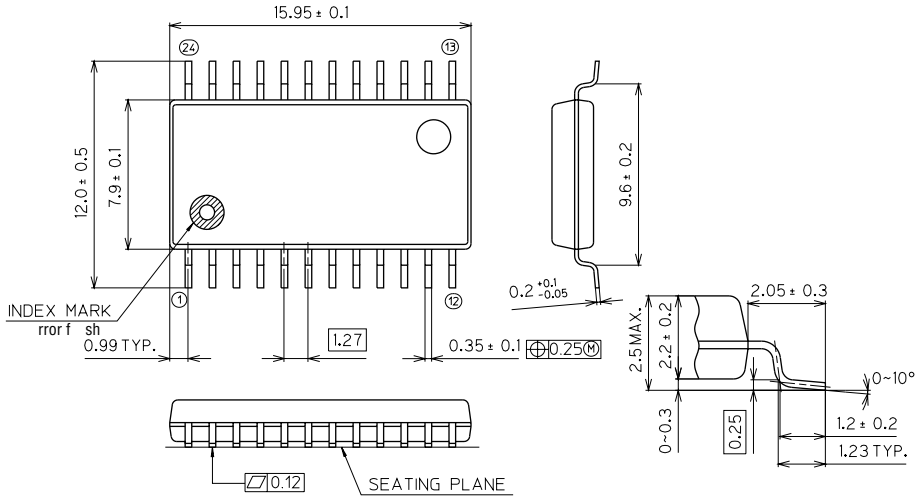
I 1 . 4



ck e er l	E oxy res
Le d fr e er l	4 lloy
re e	older l
older l e h ck ess	µ or ore
ck e we h	1. TY .

(Unit : mm)

4 4 1. 7 K



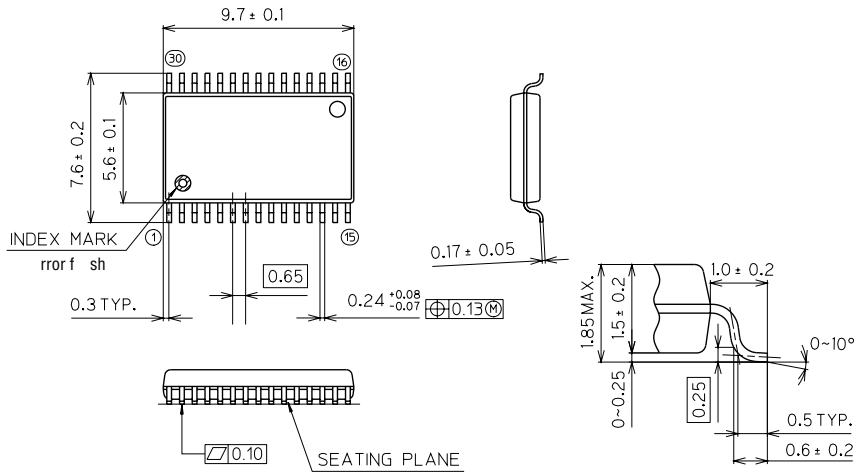
ck e er l	E oxy res
Le d fr e er l	4 lloy
re e	older l
older l e h ck ess	µ or ore
ck e we h	. TY .

Q Q Q J Q J G

,

(Unit : mm)

. K



ck e er l	E oxy res
Le d fr e er l	4 lloy
re e	older l
older l e h ck ess	µ or ore
ck e we h	.19 TY .

Q Q Q J Q J G

,

REVISION HISTORY

Document No.	Date	Page		Description
		Previous Edition	Current Edition	
E2D0011-39-91	Sep. 1999	—	—	Final edition 1
FEDL6585-02	Jun. 30, 2004	—	—	Final edition 2
		1	1	Changed the voice analysis editing tools from AR203 and AR204 to AR207.
		1	1	Changed the package product names from MSM6585GS-K and MSM6585GS-AK to MSM6585MAZXXX and MSM6585MBZXXX, respectively.
FEDL6585-03	Aug. 25, 2004	10	10	Changed the product name of the circuit block in the upper-left portion of the block diagram from MSM4013 to MSM4040.

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