

**CXK5V8257BTM/BYM/BM -70LL/10LL**

**32768-word × 8-bit High Speed CMOS Static RAM**

**Description**

The CXK5V8257BTM/BYM/BM is 262,144 bits high speed CMOS static RAM organized as 32768-words by 8 bits.

A polysilicon TFT cell technology realized extremely low stand-by current and higher data retention stability.

Operating on a single 3.3V supply, directly LVTTTL compatible (All inputs and outputs).

And special feature are, low power consumption, high speed and broad package line-up.

The CXK5V8257BTM/BYM/BM is a suitable RAM for portable equipment with battery back up.

**Features**

- Single +3.3V supply: 3.3V ±0.3V
- Directly LVTTTL compatible: All inputs and outputs
- Fast access time: (Access time)

CXK5V8257BTM/BYM/BM	
-70LL	70ns (Max.)
-10LL	100ns (Max.)

- Low standby current:
- |                     |              |
|---------------------|--------------|
| CXK5V8257BTM/BYM/BM |              |
| -70LL/10LL          | 3.5µA (Max.) |

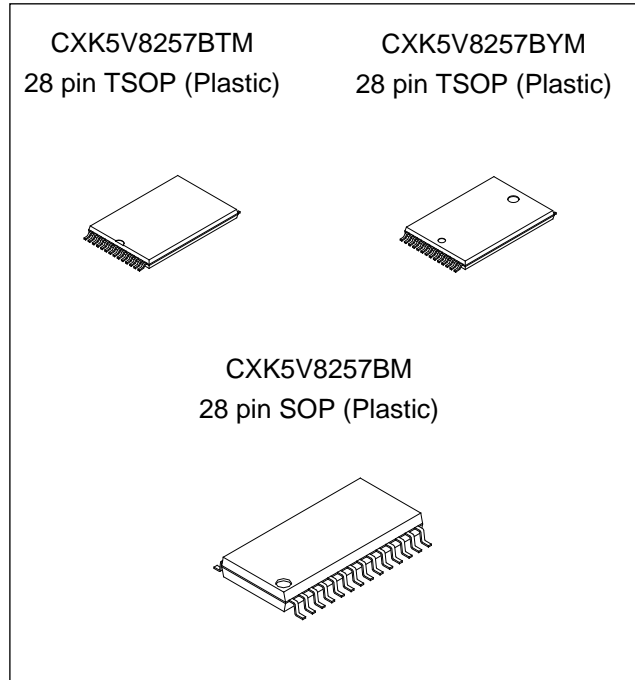
- Low power data retention: 2.0V (Min.)
  - Available in many packages
- |                  |                                     |
|------------------|-------------------------------------|
| CXK5V8257BTM/BYM | 8mm × 13.4mm 28 pin<br>TSOP Package |
| CXK5V8257BM      | 450mil 28 pin<br>SOP Package        |

**Function**

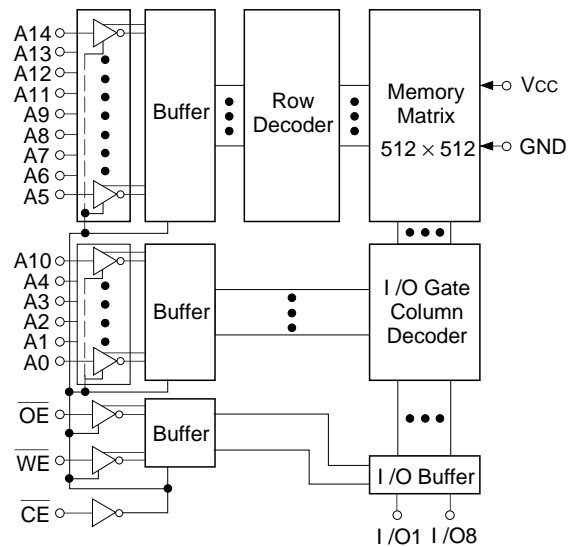
32768-word × 8 bit static RAM

**Structure**

Silicon gate CMOS IC

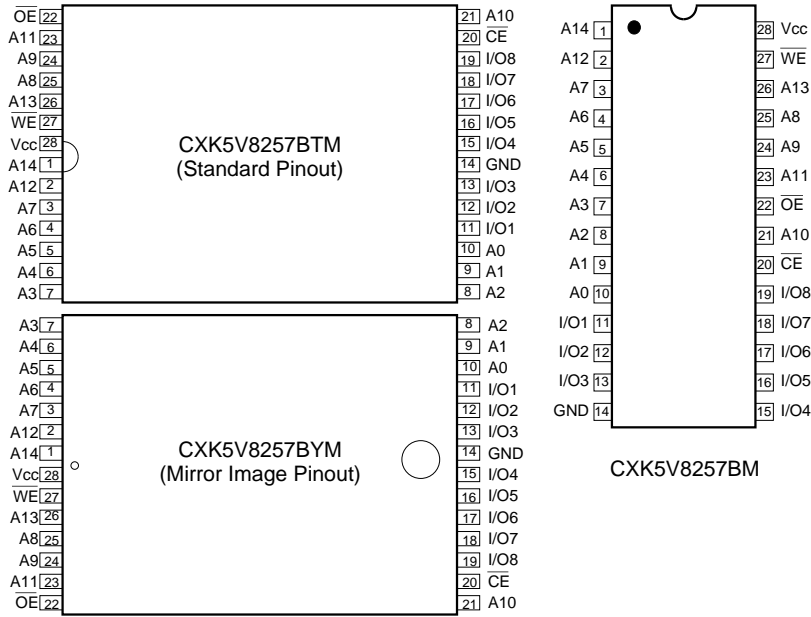


**Block Diagram**



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Pin Configuration (Top View)



Pin Description

Symbol	Description
A0 to A14	Address input
I/O1 to I/O8	data input/output
$\overline{CE}$	Chip enable input
$\overline{WE}$	Write enable input
$\overline{OE}$	Output enable input
Vcc	+3.3V power supply
GND	Ground

Absolute Maximum Ratings

(Ta = 25°C, GND = 0V)

Item	Symbol	Rating	Unit
Supply voltage	Vcc	-0.5 to +4.6	V
Input voltage	V <sub>IN</sub>	-0.5*1 to Vcc + 0.5	V
Input and output voltage	V <sub>I/O</sub>	-0.5*1 to Vcc + 0.5	V
Allowable power dissipation	P <sub>D</sub>	0.7	W
Operating temperature	T <sub>opr</sub>	0 to +70	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C
Soldering temperature · time	T <sub>solder</sub>	235 · 10	°C · s

\*1 V<sub>IN</sub>, V<sub>I/O</sub> = -3.0V Min. for pulse width less than 50ns.

Truth Table

$\overline{CE}$	$\overline{OE}$	$\overline{WE}$	Mode	I/O1 to I/O8	Vcc Current
H	×	×	Not selected	High Z	I <sub>SB1</sub> , I <sub>SB2</sub>
L	H	H	Output disable	High Z	I <sub>CC1</sub> , I <sub>CC2</sub>
L	L	H	Read	Data out	I <sub>CC1</sub> , I <sub>CC2</sub>
L	×	L	Write	Data in	I <sub>CC1</sub> , I <sub>CC2</sub>

× : "H" or "L"

DC Recommended Operating Conditions

(Ta = 0 to +70°C, GND = 0V)

Item	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Vcc	3.0	3.3	3.6	V
Input high voltage	V <sub>IH</sub>	2.0	—	Vcc + 0.3	
Input low voltage	V <sub>IL</sub>	-0.3*2	—	0.8	

\*2 V<sub>IL</sub> = -3.0V Min. for pulse width less than 50ns.

**Electrical Characteristics**

**• DC characteristics**

( $V_{CC} = 3.3V \pm 0.3V$ ,  $GND = 0V$ ,  $T_a = 0$  to  $+70^\circ C$ )

Item	Symbol	Test Conditions	Min.	Typ.*1	Max.	Unit	
Input leakage current	$I_{LI}$	$V_{IN} = GND$ to $V_{CC}$	-0.5	—	0.5	$\mu A$	
Output leakage current	$I_{LO}$	$\overline{CE} = V_{IH}$ , $OE = V_{IH}$ or $WE = V_{IL}$ , $V_{I/O} = GND$ to $V_{CC}$	-0.5	—	0.5	$\mu A$	
Operating power supply current	$I_{CC1}$	$\overline{CE} = V_{IL}$ , $V_{IN} = V_{IH}$ or $V_{IL}$ , $I_{OUT} = 0mA$	—	0.9	2	mA	
Average operating current	$I_{CC2}$	Min. cycle, Duty = 100%, $I_{OUT} = 0mA$	70LL	—	21	40	mA
			10LL	—	18	35	
Standby current	$I_{SB1}$	$\overline{CE} \geq V_{CC} - 0.2V$	0 to $+70^\circ C$	—	—	3.5	$\mu A$
			0 to $+40^\circ C$	—	—	0.7	
			$+25^\circ C$	—	0.12	0.35	
	$I_{SB2}$	$\overline{CE} = V_{IH}$	—	0.06	0.7	mA	
Output high voltage	$V_{OH}$	$I_{OH} = -2mA$	2.4	—	—	V	
Output low voltage	$V_{OL}$	$I_{OL} = 2.0mA$	—	—	0.4	V	

\*1  $V_{CC} = 3.3V$ ,  $T_a = 25^\circ C$

**I/O capacitance**

( $T_a = 25^\circ C$ ,  $f = 1MHz$ )

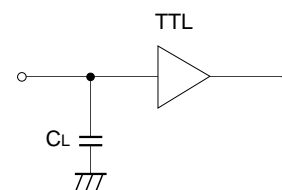
Item	Symbol	Test condition	Min.	Typ.	Max.	Unit
Input capacitance	$C_{IN}$	$V_{IN} = 0V$	—	—	8	pF
I/O capacitance	$C_{I/O}$	$V_{I/O} = 0V$	—	—	10	pF

**Note)** This parameter is sampled and is not 100% tested.

**AC Characteristics**

**• AC test conditions** ( $V_{CC} = 3.3V \pm 0.3V$ ,  $T_a = 0$  to  $+70^\circ C$ )

Item	Conditions	
Input pulse high level	$V_{IH} = 2.0V$	
Input pulse low level	$V_{IL} = 0.8V$	
Input rise time	$t_r = 5ns$	
Input fall time	$t_f = 5ns$	
Input and output reference level	1.4V	
Output load conditions	-70LL	$C_L^{*2} = 30pF$ , 1TTL
	-10LL	$C_L^{*2} = 100pF$ , 1TTL



\*2  $C_L$  includes scope and jig capacitances.

• Read cycle ( $\overline{WE} = "H"$ )

Item	Symbol	-70LL		-10LL		Unit
		Min.	Max.	Min.	Max.	
Read cycle time	$t_{RC}$	70	—	100	—	ns
Address access time	$t_{AA}$	—	70	—	100	ns
Chip enable access time ( $\overline{CE}$ )	$t_{CO}$	—	70	—	100	ns
Output enable to output valid	$t_{OE}$	—	35	—	50	ns
Output hold from address change	$t_{OH}$	20	—	20	—	ns
Chip enable to output in low Z ( $\overline{CE}$ )	$t_{LZ}$	10	—	10	—	ns
Output enable to output in low Z ( $\overline{OE}$ )	$t_{OLZ}$	5	—	10	—	ns
Chip disable to output in high Z ( $\overline{CE}$ )	$t_{HZ}^{*1}$	—	30	—	35	ns
Output disable to output in high Z ( $\overline{OE}$ )	$t_{OHZ}^{*1}$	—	30	—	35	ns

\*1  $t_{HZ}$  and  $t_{OHZ}$  are defined as the time required for outputs to turn to high impedance state and are not referred to as output voltage levels.

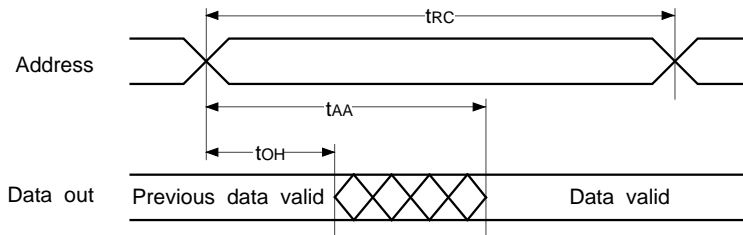
• Write cycle

Item	Symbol	-70LL		-10LL		Unit
		Min.	Max.	Min.	Max.	
Write cycle time	$t_{WC}$	70	—	100	—	ns
Address valid to end of write	$t_{AW}$	60	—	80	—	ns
Chip enable to end of write	$t_{CW}$	60	—	80	—	ns
Data to write time overlap	$t_{DW}$	30	—	35	—	ns
Data hold from write time	$t_{DH}$	0	—	0	—	ns
Write pulse width	$t_{WP}$	55	—	60	—	ns
Address setup time	$t_{AS}$	0	—	0	—	ns
Write recovery time ( $\overline{WE}$ )	$t_{WR}$	0	—	0	—	ns
Write recovery time ( $\overline{CE}$ )	$t_{WR1}$	0	—	0	—	ns
Output active from end of write	$t_{OW}$	10	—	10	—	ns
Write to output in high Z	$t_{WHZ}^{*2}$	—	30	—	35	ns

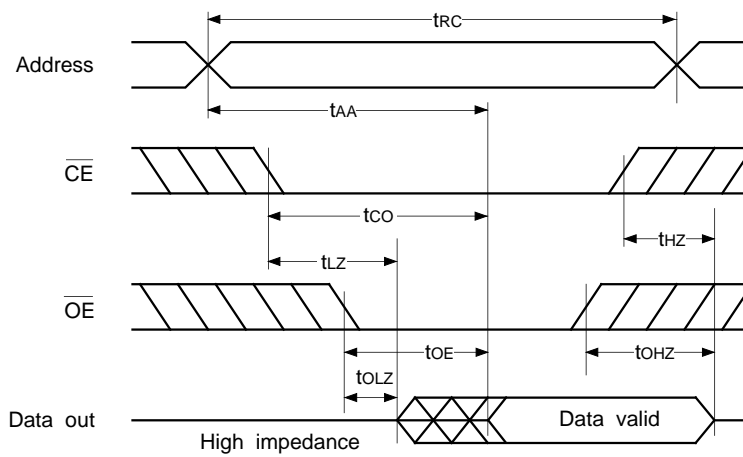
\*2  $t_{WHZ}$  is defined as the time required for outputs to turn to high impedance state and is not referred to as output voltage level.

**Timing Waveform**

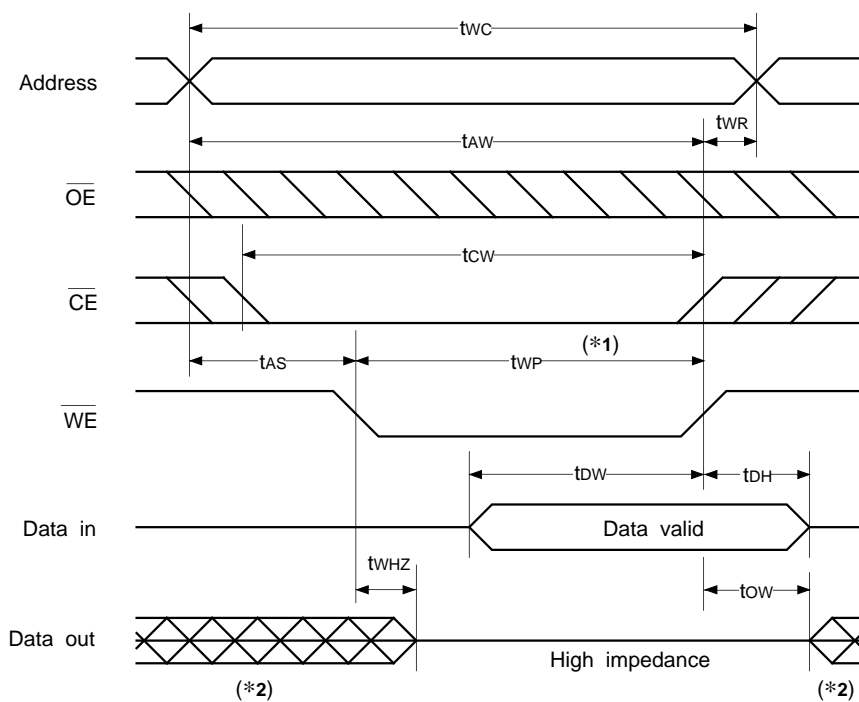
- **Read cycle (1):**  $\overline{CE} = \overline{OE} = V_{IL}$ ,  $\overline{WE} = V_{IH}$



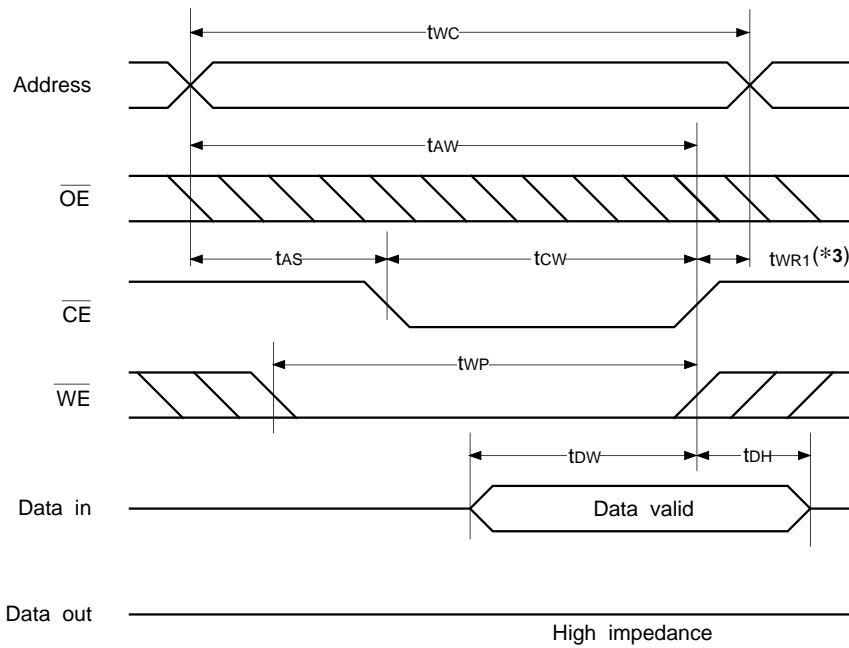
- **Read cycle (2):**  $\overline{WE} = V_{IH}$



- **Write cycle (1):**  $\overline{WE}$  control



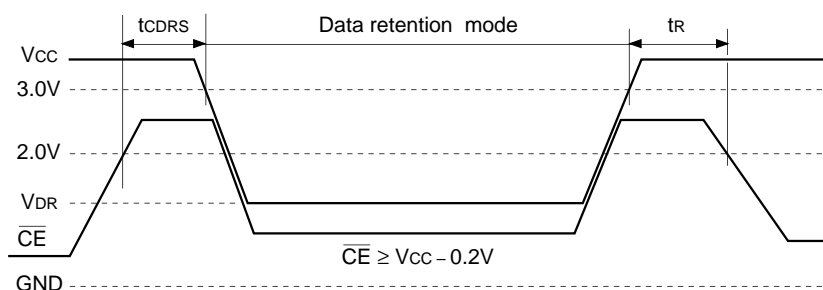
• Write cycle (2):  $\overline{CE}$  control



- \*1 Write is executed when both  $\overline{CE}$  and  $\overline{WE}$  are at low simultaneously.
- \*2 Do not apply the data input voltage of the opposite phase to the output while I/O pin is in output condition.
- \*3  $t_{WR1}$  is measured at the period from the rising edge of  $\overline{CE}$  to the end of write cycle.

Data retention waveform

• Low supply voltage data retention waveform



Data Retention Characteristics

(Ta = 0 to +70°C)

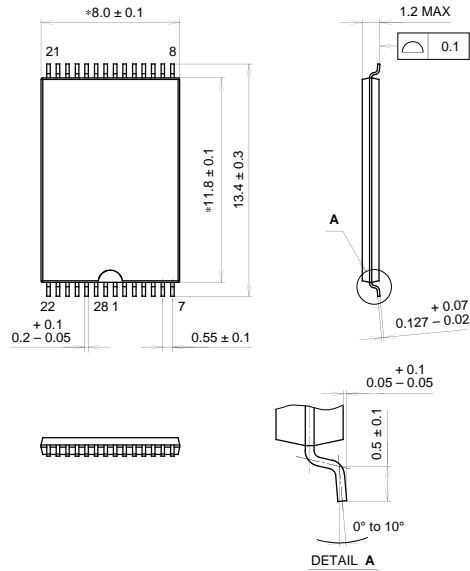
Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit	
Data retention voltage	V <sub>DR</sub>	$\overline{CE} \geq V_{CC} - 0.2V$	2.0	—	3.6	V	
Data retention current	I <sub>CCDR1</sub>	V <sub>CC</sub> = 3.0V, $\overline{CE} \geq 2.8V$	0 to +70°C	—	—	3	μA
			0 to +40°C	—	—	0.6	
			+25°C	—	0.1	0.3	
	I <sub>CCDR2</sub>	V <sub>CC</sub> = 2.0 to 3.6V, $\overline{CE} \geq V_{CC} - 0.2V$	—	0.12*1	3.5	μA	
Data retention setup time	t <sub>CDRS</sub>	Chip disable to data retention mode	0	—	—	ns	
Recovery time	t <sub>R</sub>		5	—	—	ms	

\*1 V<sub>CC</sub> = 3.3V, Ta = 25°C

Package Outline Unit: mm

CXK5V8257BTM

28PIN TSOP (Plastic)



NOTE: Dimension \* does not include mold protrusion.

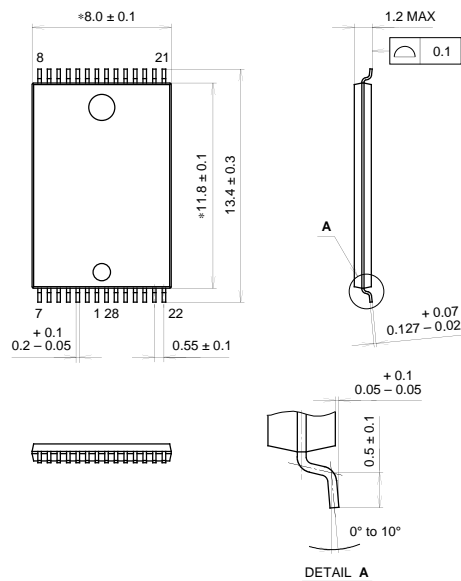
PACKAGE STRUCTURE

SONY CODE	TSOP-28P-L01
EIAJ CODE	TSOP028-P-0000-A
JEDEC CODE	———

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER / 42 ALLOY
PACKAGE WEIGHT	0.2g

CXK5V8257BYM

28PIN TSOP (Plastic)



NOTE: Dimension \* does not include mold protrusion.

PACKAGE STRUCTURE

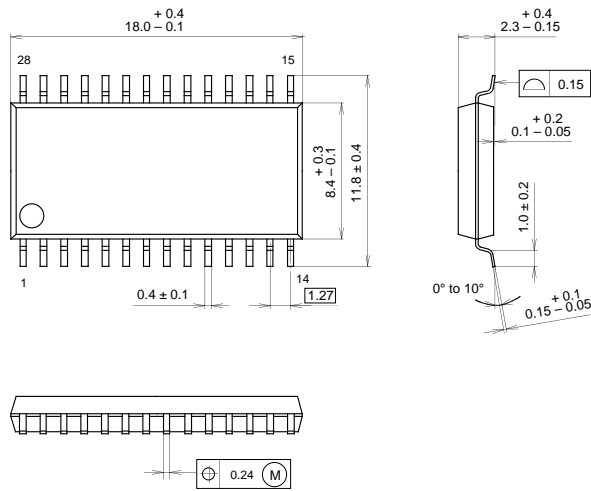
SONY CODE	TSOP-28P-L01R
EIAJ CODE	TSOP028-P-0000-B
JEDEC CODE	———

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	COPPER / 42 ALLOY
PACKAGE WEIGHT	0.2g



CXK5V8257BM

28PIN SOP (PLASTIC)



PACKAGE STRUCTURE

SONY CODE	SOP-28P-L05
EIAJ CODE	+SOP028-P-0450
JEDEC CODE	

PACKAGE MATERIAL	EPOXY RESIN
LEAD TREATMENT	SOLDER PLATING
LEAD MATERIAL	42 ALLOY
PACKAGE WEIGHT	0.7g