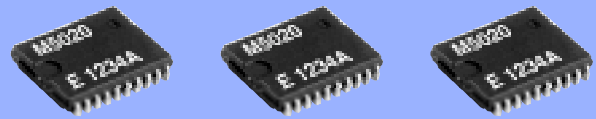


**CRYSTAL OSCILLATOR**  
**MULTI-OUTPUT 32.768 kHz and 48 MHz**

**MG - 5020JE**

- Frequency range : 32.768 kHz and 48.00512 MHz
- Supply voltage : 32.768 kHz oscillation circuit 1.8 V to 3.6 V  
 48 MHz oscillation circuit 2.7 V to 3.6 V.
- Built-in crystal : 32.768 kHz crystal unit
- Thickness : 1.5 mm Max.



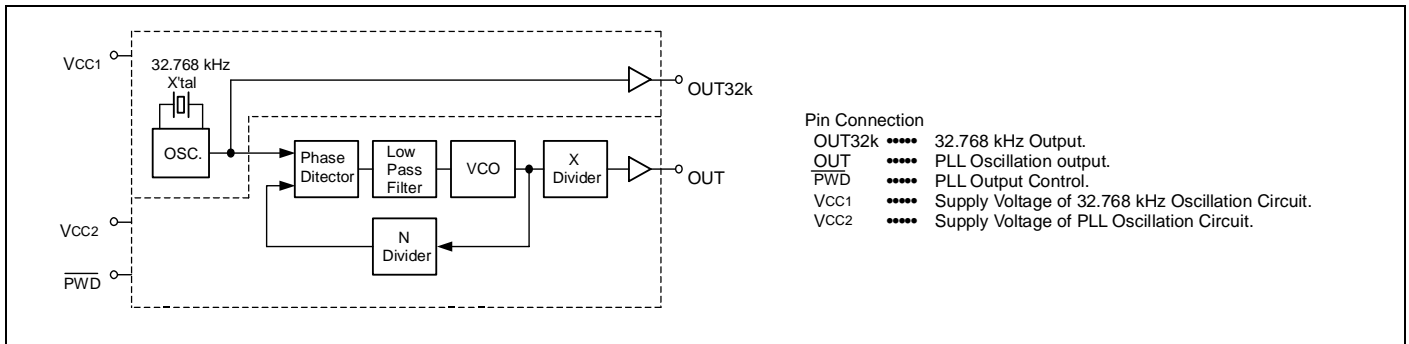
Actual size



**Specifications (characteristics)**

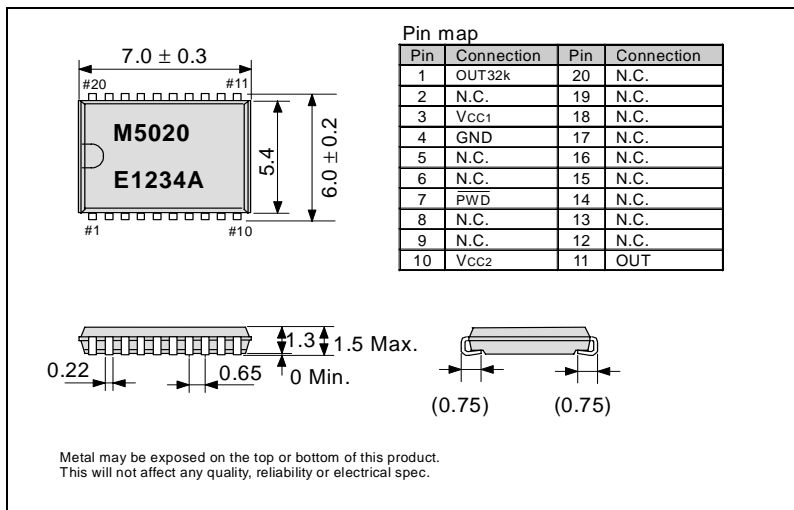
Item	Symbol	Specifications	Remarks
Output frequency range	f <sub>0</sub>	32.768 kHz	OUT32k - pin
		48.005120 MHz	OUT - pin
Supply voltage	V <sub>CC</sub>	2.7 V to 3.6 V	PLL Output
	V <sub>BK</sub>	1.8 V to 3.6 V	32.768 kHz Output
Storage temperature	T <sub>stg</sub>	-55 °C to +125 °C	Store as bare product after unpacking
Operating temperature	T <sub>use</sub>	-40 °C to +85 °C	
Frequency tolerance	F <sub>tol(osc)</sub>	5 ±23 × 10 <sup>-6</sup>	+25 °C, V <sub>CC</sub> =3.0 V
Current consumption 1 (PLL Stopping)	I <sub>CC1</sub>	3 μA Max.	V <sub>CC</sub> =1.8 V to 3.6 V PWD =GND OUT32 k=No load condition
Current consumption 2 (PLL Working)	I <sub>CC2</sub>	15 mA Max.	V <sub>CC</sub> =2.7 V to 3.6 V PWD =HIGH OUT= No load condition
Symmetry	SYM	40 % to 60 %	50 % V <sub>CC</sub> level
High output voltage	V <sub>OH</sub>	V <sub>CC</sub> -0.4 V Min.	I <sub>OH</sub> =100 μA(OUT32k), 4.0 mA(OUT)
Low output voltage	V <sub>OL</sub>	0.4 V Max.	I <sub>OL</sub> =-100 μA(OUT32k), -4.0 mA(OUT)
Output load condition (CMOS)	L <sub>CMOS</sub>	15 pF Max.	OUT32k pin, OUT pin
Output enable input voltage	V <sub>IH</sub>	80 % V <sub>CC</sub> to V <sub>CC</sub> +0.2 V	PWD pin
Output disable input voltage	V <sub>IL</sub>	GND-0.2 V to 0.2 V <sub>CC</sub>	PWD pin
Output rise time	t <sub>r</sub>	5 ns Max.	20 % V <sub>CC</sub> →80 % V <sub>CC</sub> level, OUT pin
Output fall time	t <sub>f</sub>	5 ns Max.	80 % V <sub>CC</sub> →20 % V <sub>CC</sub> level, OUT pin
Jitter	P <sub>j</sub>	150 ps Max.	V <sub>CC</sub> =2.7 V to 3.6 V Period jitter
Oscillation start up time	t <sub>STAI</sub>	3 s Max.	+25 °C, V <sub>CC</sub> =0 V→1.8 V to 3.6 V
	t <sub>STAP</sub>	0.1 s	V <sub>CC</sub> =0 V → 2.7 V to 3.6 V, PWD=LOW→High
Frequency aging	F <sub>aging</sub>	±5 × 10 <sup>-6</sup> / year Max.	+25 °C, V <sub>CC</sub> = 3.0 V, First year

**Block diagram**



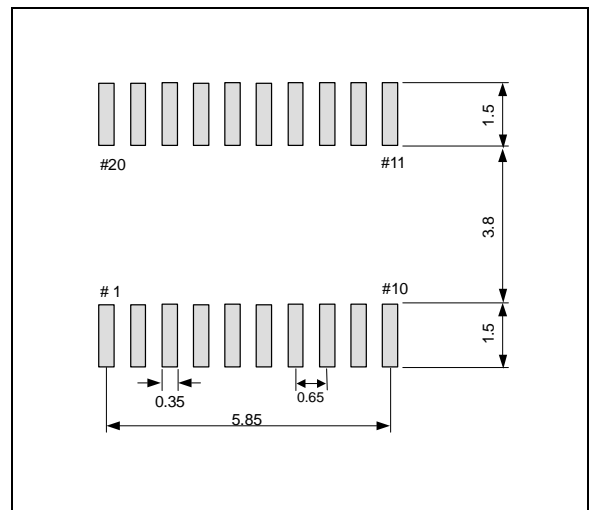
**External dimensions**

(Unit:mm)



**Footprint (Recommended)**

(Unit:mm)



# “3D STRATEGY” EPSON TOYOCOM

In order to meet customer needs in a rapidly advancing digital, broadband and ubiquitous society, we are committed to offering products that are one step ahead of the market and a rank above the rest in quality. To achieve our goals, we follow a “3D (three device) strategy” designed to drive both horizontal and vertical growth. We will to grow our three device categories of “Timing Devices”, “Sensing Devices” and “Optical Devices”, and expand vertical growth through a combination of products from these categories.

Quartz devices have become crucial in the network environment where products are increasingly intended for broadband, ubiquitous applications and where various types of terminals can transfer information almost immediately via LAN and WAN on a global scale. Epson Toyocom Corporation addresses every single aspect within a network environment. The new corporation offers “Digital Convergence” solutions to problems arising with products for consumer use, such as, core network systems and automotive systems.

## PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Epson Toyocom, all environmental initiatives operate under the Plan-Do-Check-Action(PDCA) cycle designed to achieve continuous improvements. The environmental management system (EMS) operates under the ISO 14001 environmental management standard. All of our major manufacturing and non-manufacturing sites, in Japan and overseas, completed the acquisition of ISO 14001 certification. In the future, new group companies will be expected to acquire the certification around the third year of operations.

ISO 14000 is an international standard for environmental management that was established by the International Standards Organization in 1996 against the background of growing concern regarding global warming, destruction of the ozone layer, and global deforestation.

## WORKING FOR HIGH QUALITY

Epson Toyocom quickly began working to acquire company-wide ISO 9000 series certification, and has acquired ISO 9001 or ISO 9002 certification for all targeted products manufactured in Japanese and overseas plants.

Epson Toyocom has acquired QS-9000 certification, which is of a higher level. Also, TS 16949 certification, which is also of a higher level, has been acquired.

QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S. automobile manufacturers based on the international ISO 9000 series.

ISO/TS 16949 is a global standard based on QS-9000, a severe standard corresponding to the requirements from the automobile industry.

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  - / Space equipment (artificial satellites, rockets, etc.) / Transportation vehicles and related (automobiles, aircraft, trains, vessels, etc.)
  - / Medical instruments to sustain life / Submarine transmitters / Power stations and related / Fire work equipment and security equipment
  - / traffic control equipment / and others requiring equivalent reliability.
- In this new crystal master for Epson Toyocom, product codes and markings will remain as previously identified prior to the merger. Due to the on-going strategy of gradual unification of part numbers, please review product codes and markings, as they will change during the course of the coming months. We apologize for the inconvenience, but we will eventually have a unified part numbering system for Epson Toyocom that will be user friendly.