#### SEIKO EPSON CORPORATION

### CRYSTAL OSCILLATOR (Programmable) OUTPUT: CMOS SG-8101 series

- Frequency range : 0.67 MHz to 170 MHz (1 ppm Step)
- Supply voltage : 1.62 V to 3.63 V
- Function : Output enable (OE) or Standby (ST)
- Frequency tolerance, operating temperature: ±15 ppm (-40 °C to +85 °C) ±20 ppm, ±50 ppm (-40 °C to +105 °C)
- : 2.5 x 2.0, 3.2 x 2.5, 5.0 x 3.2, 7.0 x 5.0 (mm) • Package
- PLL technology to enable short lead time
- Available field oscillator programmer "SG-Writer II"

### RoHS Product Number (please contact us) SG-8101CA: X1G005191xxxx00 SG-8101CB: X1G005201xxxx00 SG-8101CE: X1G005211xxxx00 Compliant Free SG-8101CG: X1G005181xxxx00 CG CE CB CA

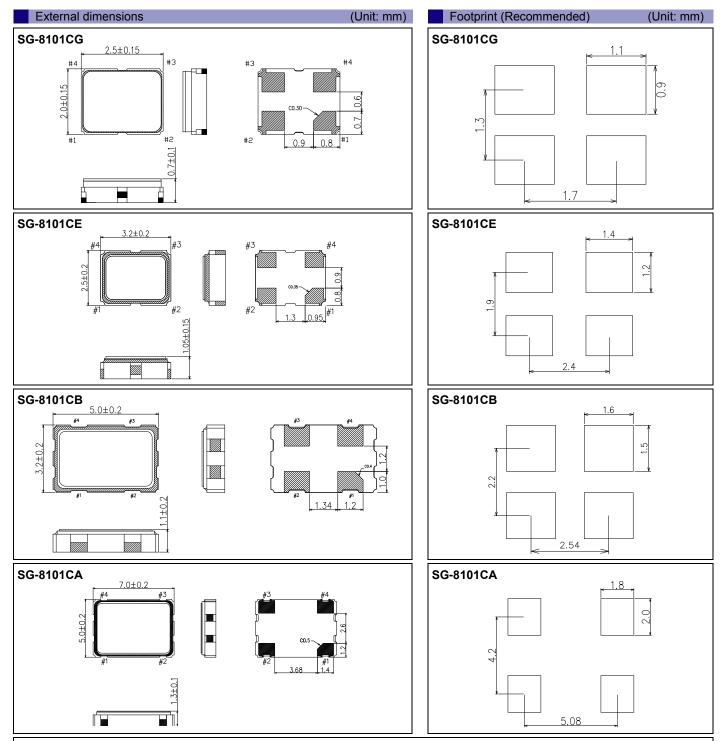
	Specification	ons (charac	teristics)							
Supply Voltage         Vcc         1.62 V to 1.98 V to 2.20 V to 2.20 V to 2.20 V to 2.80 V 2.70 V to 3.63 V         -           Output frequency range         fo         0.67 MHz to 170 MHz         -         -           Operating temperature         T_stg         -40 °C to +85 °C         -         -           Operating temperature         T_use         -40 °C to +85 °C         -         -           Frequency tolerance'1         f_tol         -         -         -         -           Current consumption         loc         3.2 mA Max         3.3 mA Max         3.5 mA Max         T_use = 40 °C to +105 °C         No load, fo = 20 MHz           Current consumption         loc         3.2 mA Max         3.3 mA Max         3.5 mA Max         T_use = +105 °C         No load, fo = 20 MHz           Output disable current         1_std         3.2 mA Max         3.3 mA Max         3.5 mA Max         7.0 wes +25 °C         No load, fo = 100 MHz           Standby current         1_std         0.9 µA Max         1.3 µA Max         3.3 mA Max         3.5 mA Max         2.5 µA Max         2.5 µA Max         2.5 µA Max         1.0 wA Maz         1.5 µA Max         1.0 wA Max         1.0 µA Ma	Item Symbol					cations		Co	nditions/Remarks	
1.62 V b 198 V 1.98 V 12,20 V 10,280 V [2,70 V to 3.63 V           Output frequency range         f         0.67 MHz to 170 MHz           Storage temperature         T_use	Supply voltage		Vcc				_			
Storage temperature         T_stg         40 °C to +125 °C         Storage as single product.           Operating temperature         T_use         -40 °C to +155 °C         -           Frequency tolerance'1         f_Lot         -         -           Storage temperature         f_Lot         -         -           Image: Storage temperature         f_Lot         -         -         -           Frequency tolerance'1         f_Lot         -         -         -         -           Current consumption         Icc         3.2 mA Max.         3.3 mA Max.         3.4 mA Max.         8.1 mA Max.         1.7 use = -105 °C           Standby current         Ldis         5.8 mA Max.         6.7 mA Max.         8.1 mA Max.         1.7 use = -105 °C         No load, fo = 170 MHz           Standby current         Ldis         3.2 mA Max.         3.2 mA Max.         3.3 mA Max.         2.5 µA Max.         1.5 µA Max.         1.5 µA Max.         0.5 µA Max	, 0			1.62 V to 1.98 V			2.70 V to 3.63 V			
Operating temperature         T_use         -40 °C to +85 °C         -           Frequency tolerance'1         f_old         B: ±15 × 10 °         T_use = -40 °C to +85 °C         -           Frequency tolerance'1         f_old         C: ±20 × 10 °         T_use = -40 °C to +105 °C         -           Current consumption         2.2 mA Max         3.3 mA Max         3.4 mA Max         3.5 mA Max         T_use = -40 °C to +105 °C           Current consumption         2.2 mA Max         3.3 mA Max         3.4 mA Max         3.5 mA Max         T_use = +105 °C           0 tiput disable current         L dis         3.2 mA Max         3.2 mA Max         3.5 mA Max         T_use = +25 °C           0 uput disable current         L dis         3.2 mA Max         3.2 mA Max         3.3 mA Max         3.5 mA Max         0.5 mA Typ.           Standby current         L std         0.9 µA Max         1.0 µA Max         1.5 µA Max         2.5 µA Max         T_use = +105 °C           Symmetry         SYM         0.4 µA Typ.         0.6 µA Max         1.5 µA Max         2.5 µA Max         T_use = +25 °C           Symmetry         SYM         0.9 µA Max         1.0 µA Max         1.5 µA Max         2.5 µA Max         T_use = +105 °C           Symmetry         SYM         0.4 µA Typ.										
Operating temperature         T_use         -40 °C to +105 °C         -           Frequency tolerance <sup>11</sup> f_tol         E ±15 × 10°         T_use = -40 °C to +105 °C           Frequency tolerance <sup>11</sup> f_tol         C: ±20 × 10°         T_use = -40 °C to +105 °C           Current consumption         2.7 mA Typ.         2.9 mA Max.         3.5 m Max.         T_use = -40 °C to +105 °C           Current consumption         Loc         2.7 mA Typ.         2.9 mA Max.         3.5 m Max.         T_use = -40 °C to +105 °C           Current consumption         Loc         5.5 mA Max.         6.7 mA Max.         3.5 m Max.         T_use = -40 °C to +105 °C           Output disable current         Lotis         5.8 mA Max.         5.7 mA Typ.         3.0 mA Typ.         T_use = +25 °C           Standby current         Lotis         3.2 mA Max.         3.2 mA Max.         3.5 m Max.         T_use = +25 °C           Symmetry         SYM         10 µA Max.         15 µA Max.         25 µA Max.         T_use = +25 °C           Symmetry         SYM         45 % to 55 %         50 % Voc Level         T_use = +25 °C         ST = GND           Output voltage         Vori         10 µA Max.         15 µA Max.         14 µA Typ.         1.1 µA Typ.         1.1 µA Typ.         1.1 µA Typ.     <	Storage temperature T_stg		T_stg					Storage as single p	product.	
Frequency tolerance <sup>-1</sup> f_tol         B: ±15 × 10 <sup>-5</sup> T_use = -40 °C to +85 °C           Frequency tolerance <sup>-1</sup> f_tol         C: ±20 × 10 <sup>4</sup> T_use = -40 °C to +105 °C         Image: -40 °C to +105 °C           Current consumption         2.2 mA Max.         3.3 mA Max.         3.4 mA Max.         3.5 mA Max.         Tuse = -40 °C to +105 °C           Current consumption         loc         2.2 mA Max.         3.3 mA Max.         3.4 mA Max.         Tuse = -40 °C to +105 °C           Output disable current         L dis         3.2 mA Max.         3.3 mA Max.         3.5 mA Max.         Tuse = +25 °C         No load, fo = 20 MHz           Standby current         L dis         3.2 mA Max.         3.2 mA Max.         3.3 mA Max.         3.5 mA Max.         Tuse = +26 °C         No load, fo = 170 MHz           Standby current         L dis         3.2 mA Max.         3.2 mA Max.         3.5 mA Max.         1.5 µA Max.         1.6 µA Max.         1.1 µA Max.	Operating temp	erature	T use						-	
Frequency tolerance <sup>11</sup> f_tot         C: ±20 × 10 <sup>4</sup> T_use = -40 °C to +105 °C           Current consumption         3.2 mA Max.         3.3 mA Max.         3.4 mA Max.         3.6 mA Max.         1.5 mA Max.         1.5 mA Max.         3.4 mA Max.         3.4 mA Max.         1.5 mA Max.         1	- p								-	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		*1						-		
Current consumption         3.2 mA Max.         3.3 mA Max.         3.4 mA Max.         3.4 mA Max.         3.5 mA Max.         Tuse = +105 °C         No load, fo = 20 MHz           Current consumption           5.8 mA Max.         6.7 mA Typ.         3.0 mA Typ.         1.0 mA Max.         Tuse = +105 °C         No load, fo = 170 MHz           Output disable current         1_dis         3.2 mA Max.         3.2 mA Max.         3.3 mA Max.         3.5 mA Max.         Tuse = +105 °C         No load, fo = 170 MHz           Standby current         1_std         0.9 µA Max.         1.0 µA Max.         1.5 µA Max.         2.5 µA Max.         7 use = +105 °C         No load, fo = 170 MHz           Symmetry         SYM         0.4 µA Typ.         0.5 µA Typ.         1.1 µA Typ.         Tuse = +105 °C         ST = GND           Symmetry         SYM         45 % to 55 %         50 % Vcc. Level         Tuse = +20 °C         ST = GND           Output voltage (DC characteristics)         Vort         90 % Vcc Min.         Fise/Fail time         Vcc< *A *8 * °C	Frequency tolerance <sup>1</sup>		f_tol					-		
Current consumption         Loc         2.7 mA Typ.         2.9 mA Typ.         3.0 mA Typ.         T_use = +25 °C         No load, fo = 20 MHz           Output disable current         L_dis         5.5 mA Max.         5.7 mA Typ.         6.7 mA Max.         8.1 mA Max.         7_use = +25 °C         No load, fo = 170 MHz           Output disable current         L_dis         3.2 mA Max.         3.2 mA Max.         3.2 mA Max.         3.2 mA Max.         2.5 mA Max.         7_use = +25 °C         No load, fo = 170 MHz           Standby current         L_dis         3.2 mA Max.         3.2 mA Max.         3.2 mA Max.         2.5 µA Max.         T_use = +105 °C         No load, fo = 170 MHz           Standby current         L_std         0.9 µA Max.         1.0 µA Max.         1.5 µA Max.         2.5 µA Max.         T_use = +25 °C         ST = GND           Symmetry         SYM         45 % to 55 %         50 % Vocc Level         St = -20 ~2.5         St = 0.0 ~2.5 ~3.5 ~4.0           Output voltage (DC characteristics)         Vort         90 % Vcc Max.         St = 6 MD         St = 0.0 ~2.5 ~3.5 ~4.0           Voutput load condition         L_cMOS         10 % Vcc Max.         St = 0.0 ~2.5 ~2.5 ~4.0         St = 0.0 ~2.5 ~2.5 ~4.0           Input voltage         Voutput load condition         L_cMOS         10 % Vcc Max.						-		-	+105 °C	
Current consumption         Icc         5.5 mA Max.         5.8 mA Max.         6.7 mA Max.         8.1 mA Max.         T_use = +105 °C         No load, fo = 170 MHz           Output disable current         I_dis         3.2 mA Max.         3.2 mA Max.         3.3 mA Max.         3.5 mA Max.         0.5 mA Max. </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>No load, fo = 20 MHz</td>								-	No load, fo = 20 MHz	
$ \begin{array}{ c c c c c c c c } \hline \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Current consum	ption	lcc				<i>,</i> ,	-		
Output disable current         I_dis         3.2 mA Max.         3.2 mA Max.         3.3 mA Max.         3.5 mA Max.         0.E = GND, fo = 170 MHz           Standby current         I_std         0.9 µA Max.         1.0 µA Max.         1.5 µA Max.         2.5 µA Max.         T_use = +105 °C         ST = GND           Symmetry         SYM         45 % to 55 %         50 % V_{Cc} Level         T_use = +25 °C         ST = GND           Output voltage (DC characteristics)         V <sub>OH</sub> 90 % V <sub>Cc</sub> Min.         10 µA Max.         1.1 µA Typ.         T_use = +105 °C         ST = GND           Output voltage (DC characteristics)         V <sub>OH</sub> 45 % to 55 %         50 % V <sub>Cc</sub> Level         10 % V <sub>Cc</sub> Max.         10 % V <sub>Cc</sub> Max.         No.         No.         No.         2.5 3.5 4.0         10 % V <sub>Cc</sub> Max.         10 % V <sub>Cc</sub> Max.         No.         1.5 2.0 2.5         3.5 4.0         10 % V <sub>Cc</sub> Max.         No.         1.5 2.0 2.5         10 % V <sub>Cc</sub> 10 % V <sub>Cc</sub> Max.         No.         1.5 2.0 2.5         10 % V <sub>Cc</sub> 1.5 2.0 V V_C.         1.5 2.0		•						-	No load, fo = 170 MHz	
Standby currentIUUMax.1.5 $\mu$ Max.IJu Max.Ju Max. </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>										
Standby current         I_std         0.3 µA Typ.         0.4 µA Typ.         1.1 µA Typ.         T_use = +25 °C         ST = GND           Symmetry         SYM         45 % to 55 %         50 % V <sub>cc</sub> Level         Ion/JoL Conditions         Rise/Fall time         Vcc         N         Participation         Participation         Ion/JoL Conditions         Rise/Fall time         Vcc         N         Participation         Participation         Participation         Ion/JoL Conditions         Rise/Fall time         Vcc         N         Participation         Ion/JoL Conditions         Rise/Fall time         Vcc         N         Participation         Ion/JoL Conditions         Rise/Fall time         Vcc         N         Participation         Ion/JoL Conditions         Ion/JoL 2.5         3.5         4.0           Output voltage         Volt         Volt         10 % Vcc Max.         Participation         Ion/JoL 1.5         2.0         2.5         Sow         Ion/JoL 1.5         2.0         Vcc         N         N         N         N         N         N	Output disable of	current	I_dis					,	0 MHz	
Symmetry         SYM         0.3 µA 1yp.         0.4 µA 1yp.         0.5 µA 1yp.         1.1 µA 1yp.         I_use = 425 °C           Symmetry         SYM         45 % to 55 %         50 % V <sub>Cc</sub> Level         Iou+los Conditions           Output voltage (DC characteristics)         V <sub>OH</sub> 90 % V <sub>Cc</sub> Min.         Iou+los Conditions         Iou+los Conditions           VoL         VoL         10 % V <sub>Cc</sub> Max.         Iou+los Conditions         Iou+los Conditions           VoL         10 % V <sub>Cc</sub> Max.         Iou+los Condition         1.5 2.0 2.5         Iou+los Condition           Input voltage         VoL         10 % V <sub>Cc</sub> Max.         Iou+los Condition         Iou+los Condition           Input voltage         ViH         70 % V <sub>Cc</sub> Min.         OE or ST           Input voltage         ViH         70 % V <sub>Cc</sub> Min.         OE or ST           Input voltage         ViH         30 % V <sub>Cc</sub> Min.         OE or ST           Issee and Fall         If Fast         3.0 ns Max.         fo > 40 MHz         20 % - 80 % V <sub>Cc</sub> Slow         ViH         3.0 ns Max.         fo = 0.67 MHz to 170 MHz         _CCMOS = 15 pF           Disable Time         Istp         1 µs Max.         Measured from the time OE or ST pin crosses         V <sub>Cc</sub>	Standby current	t	I std					-	ST = GND	
$ \begin{array}{c} \label{eq:horizon} \begin{tabular}{ c                                   $	-		_	0.3 µA Typ.	1 11		1.1 µA Typ.			
$ \begin{array}{c c c c c c } \label{eq:hardenergy} \begin{tabular}{ c c c c c c c } \hline V_{OH} & V_{OH} & 90 \% V_{CC} Min. \\ \hline W_{OH} & 90 \% V_{CC} Min. \\ \hline \end{tabular} \end{tabular} \end{tabular} \end{tabular} \begin{tabular}{ c c c c c c c } \hline Rise/Fall time & V_{CC} & *A & *B & *C \\ \hline Default (fo > 40 MHz), & U_{OH} & -2.5 & -3.5 & 4.0 \\ \hline Fast & U_{OL} & 2.5 & 3.5 & 4.0 \\ \hline Fast & U_{OL} & 2.5 & 3.5 & 4.0 \\ \hline Fast & U_{OL} & 2.5 & 3.5 & 4.0 \\ \hline Fast & U_{OL} & 1.5 & 2.0 & 2.5 \\ \hline \end{tabular} \end{tabular} \end{tabular} \begin{tabular}{ c c c c c c c } \hline Default (fo > 40 MHz) & U_{OH} & -1.5 & 2.0 & 2.5 \\ \hline \end{tabular} \end{tabular} \end{tabular} \end{tabular} \begin{tabular}{ c c c c c c c } \hline Default (fo > 40 MHz) & U_{OH} & -1.5 & 2.0 & 2.5 \\ \hline \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \end{tabular} \begin{tabular}{ c c c c c c c c } \hline Default (fo > 40 MHz) & U_{OH} & -1.0 & -1.5 & 2.0 \\ \hline \end{tabular} tabu$	Symmetry		SYM		45 % t	0 55 %				
$ \begin{array}{c c c c c c c } \mbox{V}_{OH} & \begin{tabular}{ c c c c c c c } \mbox{V}_{OH} & \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$								[mA]		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			Vou		90 % V	/cc Min				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			• OH		00 /0 0		Default (fo > 40 MHz) Fast			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Output voltage							lou -15 -20 -25 -30		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	(DC characteris	tics)						Default (f0 ≤ 40 MHz)	I <sub>OL</sub> 1.5 2.0 2.5 3.0	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			Vol				Slow			
$ \begin{array}{c c c c c c c c c } \hline & & & & & & & & & & & & & & & & & & $					10 % V	cc Max.				
							*C: 2.20 V to 2.80 V, *D: 2.70 V to 3.6			
$ \begin{array}{ c c c c c c } \hline Input voltage & V_{IL} & 30 \% V_{CC} Max. & OE or ST \\ \hline V_{IL} & 30 \% V_{CC} Max. & fo > 40 MHz \\ \hline Past & tr/tf & 6.0 ns Max. & fo > 40 MHz & 20 \% - 80 \% V_{CC} \\ \hline Fast & Slow & 10.0 ns Max. & fo = 0.67 MHz to 170 MHz & L_CMOS = 15 pF \\ \hline Disable Time & t_stp & 1 \mu s Max. & Measured from the time OE or ST pin crosses \\ \hline Fast & 1 \mu s Max. & Measured from the time OE pin crosses 70 \% \\ \hline \end{array} $	Output load con	dition	L_CMOS		15 p	F Max.		•		
Vil30 % Vcc Max.fo > 40 MHzRise and Fall timeDefault $I_{tr/tf}$ $3.0 \text{ ns Max.}$ fo > 40 MHzFast Slow $1/t$ $6.0 \text{ ns Max.}$ fo < 40 MHz			VIH		70 % V	cc Min.				
Rise and Fall timeDefault Fast Slowtr/tf $6.0 \text{ ns Max.}$ fo ≤ 40 MHz fo ≤ 40 MHz $20 \% - 80 \% V_{CC.}$ L_CMOS = 15 pFSlow $10.0 \text{ ns Max.}$ fo = 0.67 MHz to 170 MHz fo = 0.67 MHz to 20 MHz $L_{CMOS} = 15 \text{ pF}$ Disable Timet_stp1 µs Max.Measured from the time OE or ST pin crosses $V_{CC}$ Enable Timet_sta1 µs Max.Measured from the time OE pin crosses 70 %	Input voltage		VIL		30 % V	cc Max.	OE or ST			
Rise and Fall timeImage: Fast Slowtr/tf $6.0 \text{ ns Max.}$ fo ≤ 40 MHz20 % - 80 % V_{CC.} $10.0 \text{ ns Max.}$ fo = 0.67 MHz to 170 MHz $L_CMOS = 15 \text{ pF}$ Disable Timet_stp1 µs Max.fo = 0.67 MHz to 20 MHzEnable Timet_sta1 µs Max.Measured from the time OE or ST pin crosses		D ( "			3.0 r	ns Max.	fo > 40 MHz			
timeFast Slowtr/tt3.0 ns Max.fo = 0.67 MHz to 170 MHz fo = 0.67 MHz to 20 MHz $L_CMOS = 15 \text{ pF}$ Disable Timet_stp10.0 ns Max.fo = 0.67 MHz to 20 MHzMeasured from the time OE or ST pin crosses $V_{CC}$ Enable Timet_sta1 µs Max.Measured from the time OE pin crosses 70 %	Rise and Fall	Default			6.0 r	ns Max.		fo≤40 MHz	20 % - 80 % V <sub>CC</sub>	
Disable Time     t_stp     1 µs Max.     Measured from the time OE or ST pin crosse       Enable Time     t_sta     1 µs Max.     Measured from the time OE pin crosses 70 %		Fast	tr/tr		3.0 r	ns Max.		fo = 0.67 MHz to 1	70 MHz L_CMOS = 15 pF	
Disable finite     C_Stp     F µs Max.     V <sub>CC</sub> Enable Time     t_sta     1 µs Max.     Measured from the time OE pin crosses 70 %	Slow				10.0 r	ns Max.	fo = 0.67 MHz to 20 MHz			
	Disable Time		t_stp		1 μ	us Max.	Measured from the time OE or $\overline{ST}$ pin crosses 30 % $V_{CC}$			
	Enable Time		t_sta		1 μ	us Max.		Measured from the time OE pin crosses 70 % $V_{CC}$		
	Resume Time		t_res		3 n	ns Max.				
Start-up timet_str3 ms Max.Measured from the time V <sub>CC</sub> reaches its rated minimum value, 1.62 V	Start-up time		t_str		3 n	ns Max.		Measured from the time $V_{CC}$ reaches its rated minimum value, 1.62 V		
Frequency aging         f_aging         This is included in frequency tolerance specification.         +25 °C, first year           44 Frequency tolerance includes initial frequency tolerance specification.         +25 °C, first year		-				, ,				

\*1 Frequency tolerance includes initial frequency tolerance, temperature variation, supply voltage variation, reflow drift, load drift and aging (+25 °C, 1 year).

Pi	n description			
Pin	Name	I/O type		Function
	OE	Input Output enable		High: Specified frequency output from OUT pin
	UL	input		Low: Out pin is low (weak pull down), only output driver is disabled.
1				High: Specified frequency output from OUT pin
	ST	Input	Standby	Low: Out pin is low (weak pull down),
				Device goes to standby mode. Supply current reduces to the least as I_std.
2	GND	Power	Ground	
3	OUT	Output	Clock output	
4	V <sub>CC</sub>	Power	Power supply	

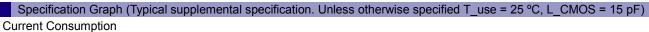
Crystal oscillator SEIKO EPSON CORPORATION Product Name SG-8101CG 170.00000MHz T C H P A ②Package type 6 Operating temperature ⑧ Rise/Fall time ④Supply voltage CA: 7.0 mm x 5.0 mm T: 1.8 V to 3.3 V Typ. G: -40 °C to +85 °C A: Default 2 3 45678 1 H: -40 °C to +105 °C B: Fast CB: 5.0 mm x 3.2 mm ①Model, ②Package type, C: Slow CE: 3.2 mm x 2.5 mm ⑤Frequency tolerance ③Frequency, ④Supply voltage, CG: 2.5 mm x 2.0 mm B: 15 x 10<sup>-6</sup> ⑦Function ⑤Frequency tolerance, ⑥Operating temperature, C: 20 x 10<sup>-6</sup> P: Output Enable ⑦Function, ⑧Rise/Fall time J: 50 x 10<sup>-6</sup> S: Standby

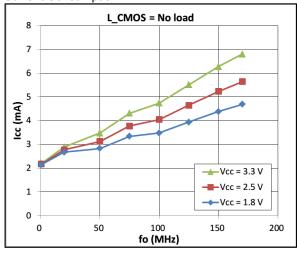
Available combination		CA: 7.0 mm x 5.0 mm			CB: 5.0 mm x 3.2 mm			CE: 3.2 mm x 2.5 mm			CG: 2.5 mm x 2.0 mm		
Frequency tolerance		B: 15 x 10 <sup>-6</sup>	C: 20 x 10 <sup>-6</sup>	J: 50 x 10 <sup>-6</sup>	B: 15 x 10 <sup>-6</sup>	C: 20 x 10 <sup>-6</sup>	J: 50 x 10⁻ <sup>6</sup>	B: 15 x 10⁻ <sup>6</sup>	C: 20 x 10 <sup>-6</sup>	J: 50 x 10⁻ <sup>6</sup>	B: 15 x 10 <sup>-6</sup>	C: 20 x 10 <sup>-6</sup>	J: 50 x 10 <sup>-6</sup>
Operating	G: -40 °C to +85 °C	✓			~			~			~		
temperature	H: -40 °C to +105 °C		✓	✓		~	~		~	~		✓	~

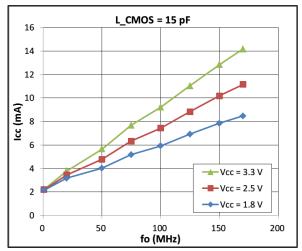


#### ■Notes:

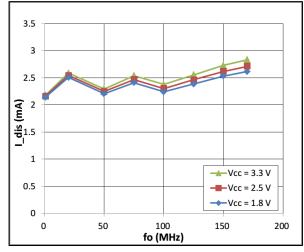
In order to achieve optimum jitter performance, the 0.1  $\mu$ F capacitor between V<sub>CC</sub> and GND should be placed. It is also recommended that the capacitors are placed on the device side of the PCB, as close to the device as possible and connected together with short wiring pattern.



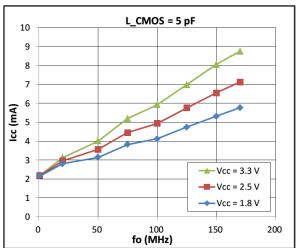


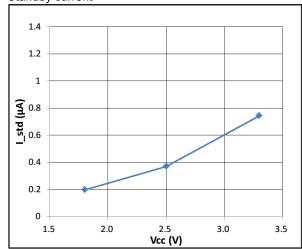


#### Output disable current



#### Notes:

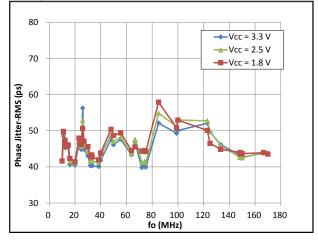


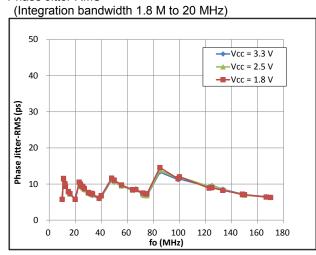


### Standby current

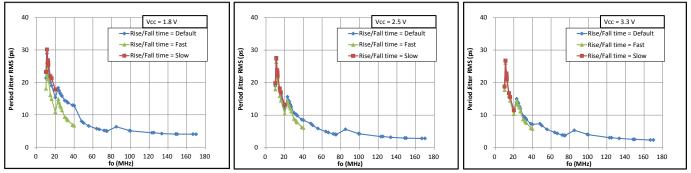
Specification Graph (Typical supplemental specification. Unless otherwise specified T\_use = 25 °C, L\_CMOS = 15 pF)Phase Jitter RMSPhase Jitter RMS

(Integration bandwidth 12 k to 20 MHz)

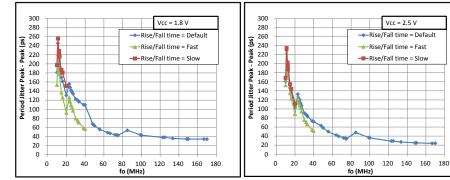


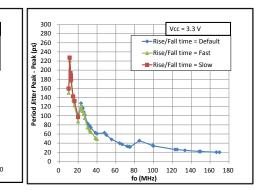


#### Period Jitter RMS



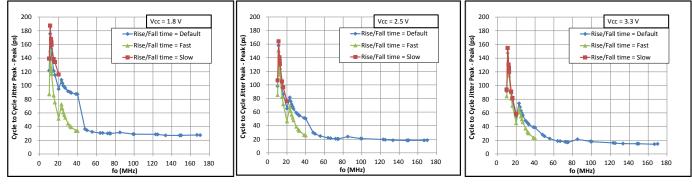
#### Period Jitter Peak-Peak





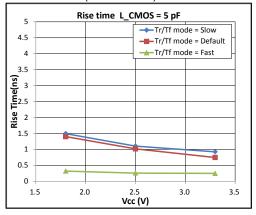
#### Cycle-to-Cycle Jitter Peak-Peak

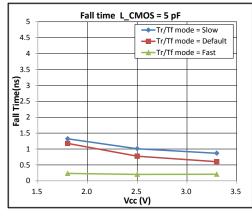
Notes:

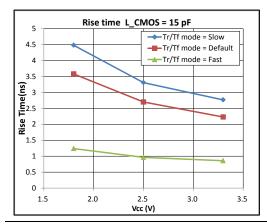


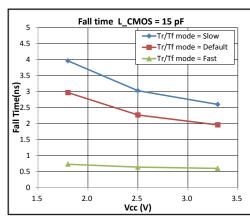
#### Specification Graph

(Typical supplemental specification. Unless otherwise specified T\_use = 25 °C, L\_CMOS = 15 pF, V<sub>CC</sub> = 3.3 V) Rise/Fall Time (fo = 20 MHz)

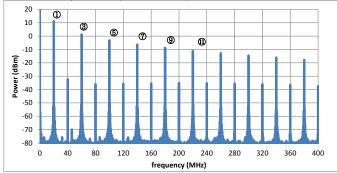




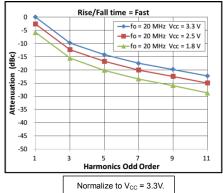


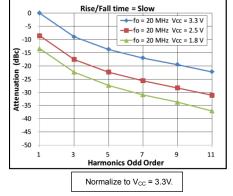


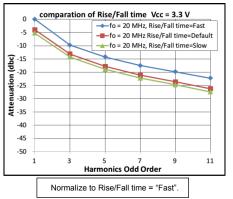
Harmonics spectrum (fo = 20 MHz)



#### Harmonics comparison







#### ■Notes:

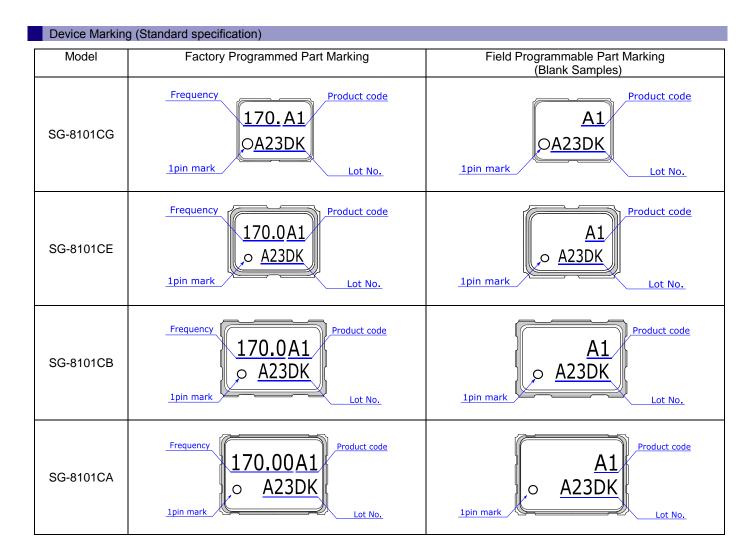
frequency	slow	default	fast
0.67 M – 20 MHz	See Slow	See Default	See Fast
20 M – 40 MHz	-	See Default	See Fast
40 M – 170 MHz	-	See Fast	See Fast

Crystal oscillator

COD Datin

#### SEIKO EPSON CORPORATION

ESD Ralling	
Test items	Breakdown voltage
Human Body Model (HBM)	2000 V
Machine Model (MM)	250 V
Charged Device Model (CDM)	750 V



#### Simulation Model

IBIS Model is available upon request. Please contact us. Information Required: Oscillator operating condition (i.e. Power Supply, Rise/Fall Time, Temperature) Crystal oscillator

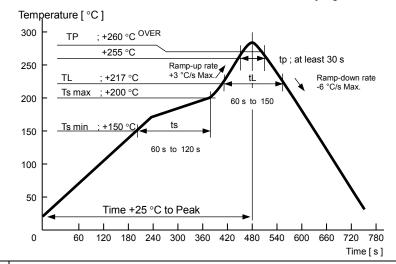
#### SEIKO EPSON CORPORATION

#### Device Material & Environmental Information

Model	Package Dimensions	# of Pins	Reference Weight	Terminal Material	Terminal Plating	Complies With EU	Pb Free	MSL Rating	Peak Temp. (Max)
			(Typ.)			RoHS			
SG-8101CG	2.5 x 2.0 x 0.7 mm	4	13 mg	W	Au	Yes	Yes	1	260 °C
SG-8101CE	3.2 x 2.5 x 1.0 mm	4	25 mg	W	Au	Yes	Yes	1	260 °C
SG-8101CB	5.0 x 3.2 x 1.1 mm	4	51 mg	W	Au	Yes	Yes	1	260 °C
SG-8101CA	7.0 x 5.0 x 1.3 mm	4	143 mg	W	Au	Yes	Yes	1	260 °C

#### SMD products Reflow profile(example)

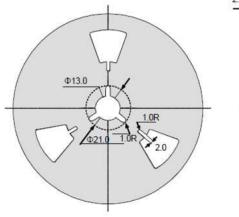
The availability of the heat resistance for reflow conditions of JEDEC-STD-020D.01 is judged individually. Please inquire.

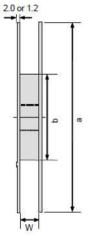


Pb Free	• Pb free.
RoHS	<ul> <li>Complies with EU RoHS directive.</li> <li>About the products without the Pb-free mark. Contains Pb in products exempted by EU RoHS directive. (Contains Pb in sealing glass, high melting temperature type solder or other.)</li> </ul>

#### Standard Packing Specification

SMD products are packed in the shipping carton as below table in accordance with taping standards EIA-481 and IEC-60286





Direction of feed  $\phi_{1.5}$ Q Carrier 0 0 0 0 0 B ▼ Таре Marking IVIAL K 0 Top tape D A 4

Standard Page	Standard Packing Quantity & Dimension(Unit mm)								
Model	Quantity	Re	eel Dimensi	on	(	Career Tape	Direction of Feed		
Model	(pcs/Reel)	а	b	W	A	В	С	D	(L= Left Direction)
SG-8101CG	3000	Φ180	Ф60	9	4	5.25	8	1.15	L
SG-8101CE	2000	Φ180	Ф60	9	4	5.25	8	1.4	L
SG-8101CB	1000	Φ180	Ф60	13	8	7.25	12	1.4	L
SG-8101CA	1000	Φ254	Φ100	17.5	8	9.25	16	2.3	L

# PROMOTION OF ENVIRONMENTAL MANAGEMENT SYSTEM CONFORMING TO INTERNATIONAL STANDARDS

At Seiko Epson, 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.

WORKING FOR HIGH QUALITY

In order provide high quality and reliable products and services than meet customer needs,

Seiko Epson made early efforts towards obtaining ISO9000 series certification and has acquired ISO9001 for all business establishments in Japan and abroad. We have also acquired ISO/TS 16949 certification that is requested strongly by major automotive manufacturers as standard.

Explanation of the mark that are using it for the catalog

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.

ISO/TS16949 is the international standard that added the sector-specific supplemental requirements for automotive industry based on ISO9001.

Pb Free	► Pb free.
RoHS	<ul> <li>Complies with EU RoHS directive.</li> <li>*About the products without the Pb-free mark.</li> <li>Contains Pb in products exempted by EU RoHS directive.</li> <li>(Contains Pb in sealing glass, high melting temperature type solder or other.)</li> </ul>
For Automotive	► Designed for automotive applications such as Car Multimedia, Body Electronics, Remote Keyless Entry etc.
Automotive Safety	► Designed for automotive applications related to driving safety (Engine Control Unit, Air Bag, ESC etc ).

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