

#100ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C #sppm/year Maximum Operating Temperature Range 20°C to +70°C Supply Voltage 5.0/dc ±10% Maximum (Unloaded) Voltage Logic High (Voh) Vdd-0.4Vdc Minimum (IOL = +16mA) Dutput Voltage Logic High (Voh) Vdd-0.4Vdc Maximum (Unloaded) Voltage Logic Low (Vol) 0.4Vdc Maximum (IOL = +16mA) Rise/Fall Time 4n Sec Maximum (Measured at 20% to 80% of waveform) Dutput Voltage Logic High (Voh) Vdvd-0.4Vdc Minimum (IOL = +16mA) Rise/Fall Time 4nSec Maximum (Measured at 20% to 80% of waveform) Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (IOL = +16mA) Rise/Fall Time 4nSec Maximum (Measured at 20% to 80% of waveform) Dutput Logic Type CMOS Fin 1 Connection Tri-State (Disabled Output: High Impedance) Pin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current 30mA Maximum (Pin 1 = Ground) Break to Peak Jitter (tRMS)	ELECTRICAL SPECIFICATIONS		
Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration) Aging at 25°C ±5ppm/year Maximum Operating Temperature Range 20°C to +70°C Supply Voltage 5.0Vdc ±10% Aging at 25°C #5pm/year Maximum Operating Temperature Range 20°C to +70°C Supply Voltage 5.0Vdc ±10% Agent Current 45mA Maximum (Unloaded) Dutput Voltage Logic High (Voh) Vdd-0.4Vdc Minimum (ICH = -16mA) Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (Measured at 20% to 80% of waveform) Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (ICL = +16mA) Dutput Voltage Cagic Low (Vol) 0.4Vdc Maximum (ICL = +16mA) Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (ICL = +16mA) Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (ICL = +16mA) Dutput Cole 50 ±10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) Doutput Logic Type CMOS Dutput Logic Type CMOS Din 1 Connection Tri-State (Disabled Output: High Impedance) In 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to en	Nominal Frequency	14.400MHz	
Operating Temperature Range -20°C to +70°C Supply Voltage 5.0Vdc ±10% nput Current 45mA Maximum (Unloaded) Vutput Voltage Logic High (Voh) Vdd-0.4Vdc Minimum (IOH = -16mA) Supply Zoltage 0.4Vdc Maximum (IOL = +16mA) Ritse/Fall Time 4nSec Maximum (IOL = +16mA) Sties/Fall Time 4nSec Maximum (Measured at 20% to 80% of waveform) Duty Cycle 50 ±10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) .coad Drive Capability 50pF HCMOS Load Maximum Dutput Logic Type CMOS Vin 1 Connection Tri-State (Disabled Output: High Impedance) +1.0Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Vin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum (Din 1 = Ground) Visable Current 30mA Maximum (Pin 1 = Ground) Visable Current 30mA Maximum, 8pSec Typical NtN Period Jitter (tFK) 100pSec Maximum, 8pSec Typical NtN Period Jitter (tRMS) 13pSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Wile STD-883, Method 1014, Condition A Storage Tempera	Frequency Tolerance/Stability	Operating Temperature Range, Supply Voltage Change, Output Load Change,	
Supply Voltage 5.0Vdc ±10% nput Current 45mA Maximum (Unloaded) Dutput Voltage Logic High (Voh) Vdd-0.4Vdc Minimum (IOH = -16mA) Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (IDL = +16mA) Nitse/Fall Time 4nSec Maximum (Measured at 20% to 80% of waveform) Duty Cycle 50 ±10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) .coad Drive Capability 50pF HCMOS Load Maximum Dutput Logic Type CMOS Nin 1 Connection Tri-State (Disabled Output: High Impedance) Nin 1 Connection Tri-State (Disable Current 30mA Maximum (Pin 1 = Ground) 204pA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum, SopSec Typical NIMS Period Jitter (tPK) 100pSec Maximum, SopSec Typical NIMS Period Jitter (tRMS) 13pSec Maximum Storage Temperature Range -55°C to +125°C	Aging at 25°C	±5ppm/year Maximum	
http://time 45mA Maximum (Unloaded) Dutput Voltage Logic High (Voh) Vdd-0.4Vdc Minimum (IOH = -16mA) Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (IOL = +16mA) Rise/Fall Time 4nSec Maximum (Measured at 20% to 80% of waveform) Duty Cycle 50 ±10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) Joad Drive Capability 50pF HCMOS Load Maximum Dutput Logic Type CMOS Vin 1 Connection Tri-State (Disabled Output: High Impedance) Vin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current 50µA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum, 50pSec Typical RMS Period Jitter (tPK) 100pSec Maximum, 8pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fin Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 2004	Operating Temperature Range	-20°C to +70°C	
Dutput Voltage Logic High (Voh) Vdd-0.4Vdc Minimum (IOH = -16mA) Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (IOL = +16mA) Rise/Fall Time 4nSec Maximum (Measured at 20% to 80% of waveform) Dutput Voltage Logic Low (Vol) 50 ± 10(%) (Measured at 20% to 80% of waveform) Duty Cycle 50 ± 10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) Load Drive Capability 50pF HCMOS Load Maximum Dutput Logic Type CMOS Pin 1 Connection Tri-State (Disabled Output: High Impedance) Pin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current 50µA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum, SpSec Typical RMS Period Jitter (tPK) 100pSec Maximum, 8pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fin Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 2004	Supply Voltage	5.0Vdc ±10%	
Dutput Voltage Logic Low (Vol) 0.4Vdc Maximum (IOL = +16mA) Rise/Fall Time 4nSec Maximum (Measured at 20% to 80% of waveform) Duty Cycle 50 ±10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) Soad Drive Capability SopF HCMOS Load Maximum Dutput Logic Type CMOS Pin 1 Connection Tri-State (Disabled Output: High Impedance) Pin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current S0µA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum, 50pSec Typical RMS Period Jitter (tPK) 100pSec Maximum NS Period Jitter (tRMS) 13pSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Rine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 2004	Input Current	45mA Maximum (Unloaded)	
AnSec Maximum (Measured at 20% to 80% of waveform) buty Cycle 50 ±10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) coad Drive Capability 50pF HCMOS Load Maximum butput Logic Type CMOS Pin 1 Connection Tri-State (Disabled Output: High Impedance) Pin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current 50µA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum, SopSec Typical RMS Period Jitter (tPK) 100pSec Maximum, 8pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 2004	Output Voltage Logic High (Voh)	Vdd-0.4Vdc Minimum (IOH = -16mA)	
Addition Additional and a constraint of a difference o	Output Voltage Logic Low (Vol)	0.4Vdc Maximum (IOL = +16mA)	
SopF HCMOS Load Maximum Dutput Logic Type CMOS Tri-State (Disabled Output: High Impedance) Pin 1 Connection Tri-State (Disabled Output; High Impedance) Pin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current SomA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum, Pin 1 = Ground) Peak to Peak Jitter (tPK) 100pSec Maximum, 50pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Storss Leak Test MIL-STD-883, Method 2004	Rise/Fall Time	4nSec Maximum (Measured at 20% to 80% of waveform)	
Dutput Logic Type CMOS Pin 1 Connection Tri-State (Disabled Output: High Impedance) Pin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current 50µA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum (Pin 1 = Ground) Peak to Peak Jitter (tPK) 100pSec Maximum, 50pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum, 8pSec Typical Start Up Time 10mSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Storage Temp MIL-STD-883, Method 2004	Duty Cycle	50 \pm 10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load)	
Pin 1 Connection Tri-State (Disabled Output: High Impedance) Pin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current 50µA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum (Pin 1 = Ground) Peak to Peak Jitter (tPK) 100pSec Maximum, 50pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum, 8pSec Typical Start Up Time 10mSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Stross Leak Test MIL-STD-883, Method 2004	Load Drive Capability	50pF HCMOS Load Maximum	
Pin 1 Input Voltage (Vih and Vil) +2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output. Standby Current 50µA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum (Pin 1 = Ground) Peak to Peak Jitter (tPK) 100pSec Maximum, 50pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum, 8pSec Typical Start Up Time 10mSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 2004	Output Logic Type	CMOS	
Standby Current 50µA Maximum (Pin 1 = Ground) Disable Current 30mA Maximum (Pin 1 = Ground) Peak to Peak Jitter (tPK) 100pSec Maximum, 50pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum, 8pSec Typical Start Up Time 10mSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 2004	Pin 1 Connection	Tri-State (Disabled Output: High Impedance)	
Disable Current 30mA Maximum (Pin 1 = Ground) Peak to Peak Jitter (tPK) 100pSec Maximum, 50pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum, 8pSec Typical Start Up Time 10mSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 2004	Pin 1 Input Voltage (Vih and Vil)	+2.0Vdc Minimum to enable output, +0.8Vdc to disable output, No Connect to enable output.	
Peak to Peak Jitter (tPK) 100pSec Maximum, 50pSec Typical RMS Period Jitter (tRMS) 13pSec Maximum, 8pSec Typical Start Up Time 10mSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 1014, Condition C Lead Integrity MIL-STD-883, Method 2004	Standby Current	50µA Maximum (Pin 1 = Ground)	
RMS Period Jitter (tRMS) 13pSec Maximum, 8pSec Typical Start Up Time 10mSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 1014, Condition C Lead Integrity MIL-STD-883, Method 2004	Disable Current	30mA Maximum (Pin 1 = Ground)	
Start Up Time 10mSec Maximum Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Storass Leak Test MIL-STD-883, Method 1014, Condition C Lead Integrity MIL-STD-883, Method 2004	Peak to Peak Jitter (tPK)	100pSec Maximum, 50pSec Typical	
Storage Temperature Range -55°C to +125°C ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 1014, Condition C Lead Integrity MIL-STD-883, Method 2004	RMS Period Jitter (tRMS)	13pSec Maximum, 8pSec Typical	
ENVIRONMENTAL & MECHANICAL SPECIFICATIONS Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 1014, Condition C Lead Integrity MIL-STD-883, Method 2004	Start Up Time	10mSec Maximum	
Fine Leak Test MIL-STD-883, Method 1014, Condition A Gross Leak Test MIL-STD-883, Method 1014, Condition C Lead Integrity MIL-STD-883, Method 2004	Storage Temperature Range	-55°C to +125°C	
Gross Leak Test MIL-STD-883, Method 1014, Condition C Method 2004	ENVIRONMENTAL & MECHANICAL SPECIFICATIONS		
And Integrity MIL-STD-883, Method 2004	Fine Leak Test	MIL-STD-883, Method 1014, Condition A	
	Gross Leak Test	MIL-STD-883, Method 1014, Condition C	
Aechanical Shock MII -STD-202 Method 213 Condition C	Lead Integrity	MIL-STD-883, Method 2004	
	Mechanical Shock	MIL-STD-202, Method 213, Condition C	

MIL-STD-202, Method 210

MIL-STD-202, Method 215

MIL-STD-883, Method 2003

MIL-STD-883, Method 1010

MIL-STD-883, Method 2007, Condition A

Resistance to Soldering Heat

Resistance to Solvents

Temperature Cycling

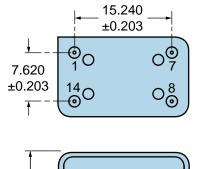
Solderability

Vibration

EP1100TSC-14.400M

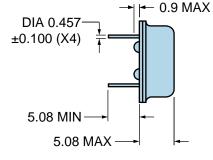


MECHANICAL DIMENSIONS (all dimensions in millimeters)



13.2

MAX



PIN	CONNECTION
1	Tri-State (High Impedance)
7	Ground/Case Ground
8	Output
14	Supply Voltage
LINE	MARKING
1	ECLIPTEK
2	EP11TS EP11=Product Series
3	14.400M
4	XXYZZ XX=Ecliptek Manufacturing Code

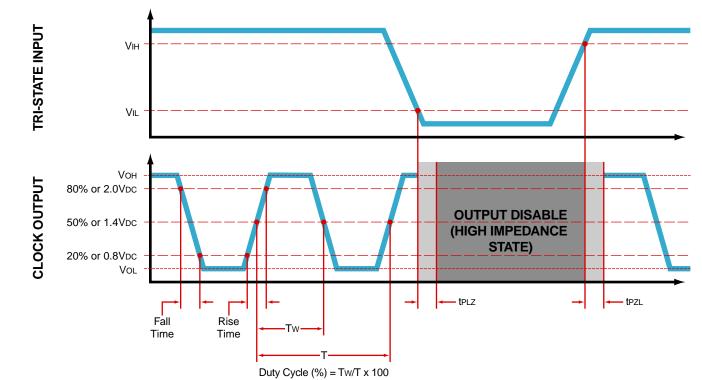
OUTPUT WAVEFORM & TIMING DIAGRAM

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MARKING

ORIENTATION

20.8 MAX

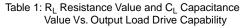


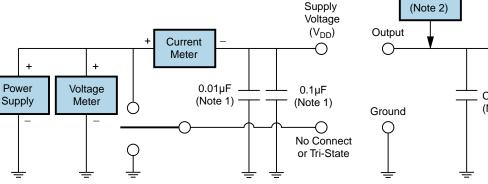
EP1100TSC-14.400M



Test Circuit for TTL Output

Output Load Drive Capability	R _L Value (Ohms)	C _L Value (pF)
10TTL	390	15
5TTL	780	15
2TTL	1100	6
10LSTTL	2000	15
1TTL	2200	3





Probe (Note 2) Dutput CL (Note 3) CL (Note 3)

Frequency

Counter

Oscilloscope

Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass capacitor close to the package ground and V_{DD} pin is required.

Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value C_L includes sum of all probe and fixture capacitance.

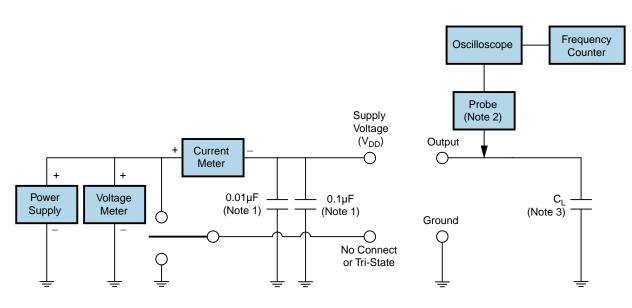
Note 4: Resistance value RL is shown in Table 1. See applicable specification sheet for 'Load Drive Capability'.

Note 5: All diodes are MMBD7000, MMBD914, or equivalent.

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Test Circuit for CMOS Output



Note 1: An external 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF high frequency ceramic bypass capacitor close to the package ground and V_{DD} pin is required.

Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value \dot{C}_{L} includes sum of all probe and fixture capacitance.



Recommended Solder Reflow Methods

EP1100TSC-14.400M



High Temperature Solder Bath (Wave Solder)

T_s MAX to T_L (Ramp-up Rate)	3°C/second Maximum
Preheat	
- Temperature Minimum (T _s MIN)	150°C
- Temperature Typical (T _s TYP)	175°C
- Temperature Maximum (T _s MAX)	200°C
- Time (t _s MIN)	60 - 180 Seconds
Ramp-up Rate (T _L to T _P)	3°C/second Maximum
Time Maintained Above:	
- Temperature (T∟)	217°C
- Time (t∟)	60 - 150 Seconds
Peak Temperature (T _P)	260°C Maximum for 10 Seconds Maximum
Target Peak Temperature (T _P Target)	250°C +0/-5°C
Time within 5°C of actual peak (t _p)	20 - 40 seconds
Ramp-down Rate	6°C/second Maximum
Time 25°C to Peak Temperature (t)	8 minutes Maximum
Moisture Sensitivity Level	Level 1
Additional Notes	Temperatures shown are applied to back of PCB board and device leads only. Do not use this method for product with the Gull Wing option.



Recommended Solder Reflow Methods

EP1100TSC-14.400M



Low Temperature Infrared/Convection 185°C

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T_s MAX to T_L (Ramp-up Rate)	5°C/second Maximum
Preheat	
- Temperature Minimum (T _s MIN)	N/A
 Temperature Typical (T_s TYP) 	150°C
- Temperature Maximum (T _s MAX)	N/A
- Time (t _s MIN)	60 - 120 Seconds
Ramp-up Rate (T⊾ to T _P)	5°C/second Maximum
Time Maintained Above:	
- Temperature (T∟)	150°C
- Time (t∟)	200 Seconds Maximum
Peak Temperature (T _P)	185°C Maximum
Target Peak Temperature (T _P Target)	185°C Maximum 2 Times
Time within 5°C of actual peak (t_p)	10 seconds Maximum 2 Times
Ramp-down Rate	5°C/second Maximum
Time 25°C to Peak Temperature (t)	N/A
Moisture Sensitivity Level	Level 1
Additional Notes	Temperatures shown are applied to body of device. Use this method only for product with the Gull Wing option.



Recommended Solder Reflow Methods

EP1100TSC-14.400M



Low Temperature Solder Bath (Wave Solder)

T_s MAX to T_L (Ramp-up Rate)	5°C/second Maximum
Preheat	
- Temperature Minimum (Ts MIN)	N/A
- Temperature Typical (T _s TYP)	150°C
- Temperature Maximum (T _s MAX)	N/A
- Time (t _s MIN)	30 - 60 Seconds
Ramp-up Rate (T _L to T _P)	5°C/second Maximum
Time Maintained Above:	
- Temperature (T∟)	150°C
- Time (t∟)	200 Seconds Maximum
Peak Temperature (T _P)	245°C Maximum
Target Peak Temperature (T _P Target)	245°C Maximum 1 Time / 235°C Maximum 2 Times
Time within 5°C of actual peak (t _p)	5 seconds Maximum 1 Time / 15 seconds Maximum 2 Times
Ramp-down Rate	5°C/second Maximum
Time 25°C to Peak Temperature (t)	N/A
Moisture Sensitivity Level	Level 1
Additional Notes	Temperatures shown are applied to back of PCB board and device leads only. Do not use this method for product with the Gull Wing option.

Low Temperature Manual Soldering

185°C Maximum for 10 seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)

High Temperature Manual Soldering

260°C Maximum for 5 seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)