

QSOP Dual-Channel Digital Isolators High Speed CE0832XX-XG Series

Features:

- Compliance Halogens Free
(Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm)
- Data rate: 10M ~ 200Mbps
- Low propagation delay: 9ns typical
- Isolation voltages 3000Vrms
- Human body model (HBM) $\pm 8\text{kV}$
- Wide temperature range: -40°C to 125°C

Description

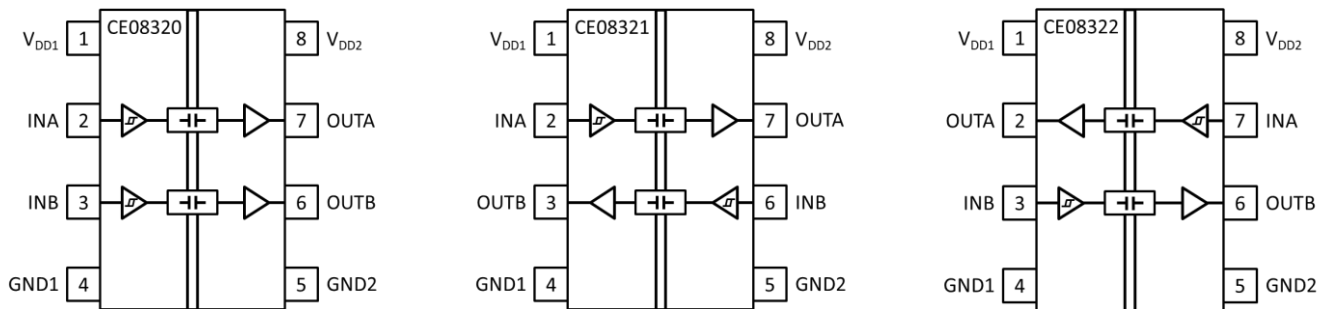
The CE0832XX-XG isolator data channels are independent.

The devices operate with the supply voltage on either side ranging from 3.0 V to 5.5 V, providing compatibility with lower voltage systems as well as enabling voltage translation functionality across the isolation barrier. The fail-safe state is available in which the outputs transition to a preset state when the input power supply is not applied.

Applications

- General-purpose multichannel isolation
- Industrial field bus isolation
- Isolation Industrial automation systems
- Isolated switch mode supplies
- Isolated ADC, DAC
- Motor control

Functional Diagram



Pin Description

NAME	PIN			DESCRIPTION
	CE08320	CEQ8321	CEQ8622	
V _{DD1}	1	1	1	Power supply, side 1
V _{DD2}	8	8	8	Power supply, side 2
GND1	4	4	4	Ground , side 1
GND2	5	5	5	Ground , side 2
INA	2	2	7	Input, channel A
INB	3	6	3	Input, channel B
OUTA	7	7	2	Output, channel A
OUTB	6	3	6	Output, channel B

Truth Table

V _{IX} Input	V _{DDI} State	V _{DD2} State	Default Low V _{OX} Output	Default High V _{OX} Output	Test Conditions /Comments
L	P	P	L	L	Normal operation
H	P	P	H	H	Normal operation
NC	P	P	L	H	Default output
X ^{*2}	UP	P	L	H	Default output ^{*3}
X ^{*2}	P	UP	Z	Z	

Notes:

1. V_{IX}/V_{OX} are the input/output signals of a given channel. V_{DDI}/V_{DD2} are the supply voltages on the input/output signal sides of this given channel.
2. Input signal (V_{IX}) must be in a low state to avoid powering the given V_{DDI} through its ESD protection circuitry.
3. If the V_{DDI} goes into unpowered status, the channel outputs the default logic signal after around 1us. If the V_{DDI} goes into powered status, the channel outputs the input status logic signal after around 5us.

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{DDX}	7	V
Maximum Input Voltage	V _{IN}	V _{DD} +0.5	V
Maximum Output Voltage	V _{OUT}	V _{DD} +0.5	V
Output Current	I _O	10	mA
Isolation Voltage *1	V _{ISO}	3000	V rms
Operating Temperature	T _{OPR}	-40 ~ +125	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C
Soldering Temperature *2	T _{SOL}	260	°C

Notes:

*1 AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1 to 8 are shorted together, and pins 9 to 16 are shorted together.

*2 For 10 seconds.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V _{DDX}	3	5.5	V
High Level Input Voltage	V _{IH}	V _{DDX} *0.7	V _{DDX}	V
Low Level Input Voltage	V _{IL}	0	V _{DDX} *0.3	V

Electro-Optical Characteristics $V_{DD1} - V_{GND1} = V_{DD2} - V_{GND2} = 3.3V$ or $5V$, $T_A = 25^\circ C$, unless otherwise noted.

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
High Level Input Voltage	V_{IH}		$0.6 \cdot V_{DDX}$	$0.7 \cdot V_{DDX}$	V	
Low Level Input Voltage	V_{IL}	$0.3 \cdot V_{DDX}$	$0.4 \cdot V_{DDX}$		V	
High Level Output Voltage	V_{OH}	$V_{DDX} - 0.1$	V_{DDX}		V	$I_O = -20\mu A$
		$V_{DDX} - 0.2$	$V_{DDX} - 0.1$			$I_O = -2mA$
Low Level Output Voltage	V_{OL}		0	0.1	V	$I_O = 20\mu A$
			0.1	0.2		$I_O = 2mA$
Input Current per Signal Channel	I_{IN}	-10	0.5	10	μA	$0V \leq \text{Signal voltage} \leq V_{DD}$
V_{DDX} Undervoltage Rising Threshold	V_{DDXUV+}	2.45	2.75	2.95	V	
V_{DDX} Undervoltage Falling Threshold	V_{DDXUV-}	2.30	2.60	2.75	V	
V_{DDX} Hysteresis	V_{DDXUVH}		0.15		V	
Common Mode Transient Immunity	CMTI		75	-	kV/ μS	$V_{CM} = 1000V$

Switching Characteristics $V_{DD1} - V_{GND1} = V_{DD2} - V_{GND2} = 3.3V$ or $5V$, $T_A = 25^\circ C$, unless otherwise noted.

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Minimum Pulse Width	PW			100	nS	
Propagation Delay	t_{PLH} 、 t_{PLH}	5.5		13.5	nS	
Pulse Width Distortion	PWD			3	nS	
Part to Part Propagation Delay Skew	t_{PSK}			2	nS	
Channel-to-Channel Delay Skew	t_{CSK}			2	nS	
Rising Time	T_r		1.5		nS	
Falling Time	T_f		1.5		nS	

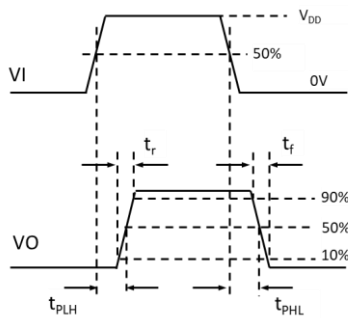
Supply Current

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
CE08320X	I _{DD1}	0.06	0.08	0.1	mA	V _{DD} = 5V VI=0V for CE08320X-L VI=5V for CE08320X-H
	I _{DD2}	0.78	0.98	1.27	mA	
	I _{DD1}	0.16	0.20	0.26	mA	V _{DD} = 5V VI=5V for CE08320X-L VI=0V for CE08320X-H
	I _{DD2}	0.74	0.92	1.2	mA	
	I _{DD1}	0.06	0.08	0.10	mA	V _{DD} = 3.3V VI=0V for CE08320X-L VI=3.3V for CE08320X-H
	I _{DD2}	0.77	0.97	1.26	mA	
	I _{DD1}	0.12	0.15	0.19	mA	V _{DD} = 3.3V VI=3.3V for CE08320X-L VI=0V for CE08320X-H
	I _{DD2}	0.71	0.89	1.15	mA	
CE08321X	I _{DD1}	0.42	0.52	0.68	mA	V _{DD} = 5V VI=0V for CE08321X-L VI=5V for CE08321X-H
	I _{DD2}	0.42	0.52	0.68	mA	
	I _{DD1}	0.44	0.55	0.71	mA	V _{DD} = 5V VI=5V for CE08321X-L VI=0V for CE08321X-H
	I _{DD2}	0.44	0.55	0.71	mA	
	I _{DD1}	0.41	0.52	0.67	mA	V _{DD} = 3.3V VI=0V for CE08321X-L VI=3.3V for CE08321X-H
	I _{DD2}	0.41	0.52	0.67	mA	
	I _{DD1}	0.41	0.52	0.66	mA	V _{DD} = 3.3V VI=3.3V for CE08321X-L VI=0V for CE08321X-H
	I _{DD2}	0.41	0.52	0.66	mA	
CE08322X	I _{DD1}	0.42	0.52	0.68	mA	V _{DD} = 5V VI=0V for CE08322X-L VI=5V for CE08322X-H
	I _{DD2}	0.42	0.52	0.68	mA	
	I _{DD1}	0.44	0.55	0.71	mA	V _{DD} = 5V VI=5V for CE08322X-L VI=0V for CE08322X-H
	I _{DD2}	0.44	0.55	0.71	mA	
	I _{DD1}	0.41	0.52	0.67	mA	V _{DD} = 3.3V VI=0V for CE08322X-L VI=3.3V for CE08322X-H
	I _{DD2}	0.41	0.52	0.67	mA	
	I _{DD1}	0.41	0.51	0.66	mA	V _{DD} = 3.3V VI=3.3V for CE08322X-L VI=0V for CE08322X-H
	I _{DD2}	0.41	0.51	0.66	mA	

Supply Current- AC signal

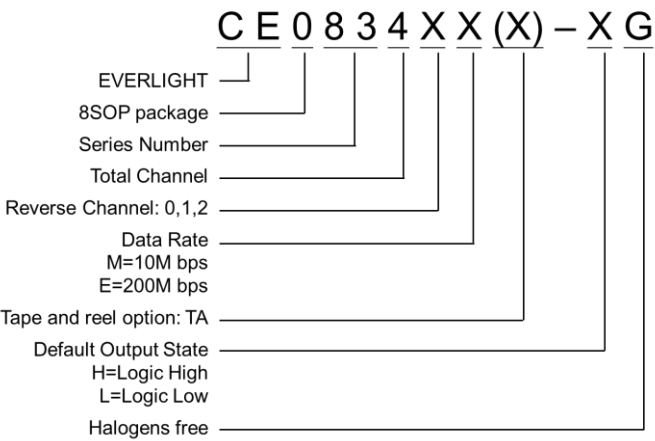
Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
CE08340E	I _{DD1} (10M)		0.24	0.36	mA	V _{DD} = 5V
	I _{DD2} (10M)		1.76	2.63	mA	
	I _{DD1} (10M)		0.18	0.27	mA	V _{DD} = 3.3V
	I _{DD2} (10M)		1.43	2.14	mA	
CE08341E	I _{DD1} (10M)		0.97	1.46	mA	V _{DD} = 5V
	I _{DD2} (10M)		0.97	1.46	mA	
	I _{DD1} (10M)		0.77	1.16	mA	V _{DD} = 3.3V
	I _{DD2} (10M)		0.77	1.16	mA	
CE08342E	I _{DD1} (10M)		0.97	1.60	mA	V _{DD} = 5V
	I _{DD2} (10M)		0.97	1.60	mA	
	I _{DD1} (10M)		0.77	1.20	mA	V _{DD} = 3.3V
	I _{DD2} (10M)		0.77	1.20	mA	
CE08340E	I _{DD1} (200M)		3.72	5.95	mA	V _{DD} = 5V
	I _{DD2} (200M)		17.20	27.52	mA	
	I _{DD1} (200M)		2.16	3.46	mA	V _{DD} = 3.3V
	I _{DD2} (200M)		11.14	17.82	mA	
CE08341E	I _{DD1} (200M)		10.40	16.64	mA	V _{DD} = 5V
	I _{DD2} (200M)		10.40	16.64	mA	
	I _{DD1} (200M)		6.58	10.53	mA	V _{DD} = 3.3V
	I _{DD2} (200M)		6.58	10.53	mA	
CE08342E	I _{DD1} (200M)		10.40	16.64	mA	V _{DD} = 5V
	I _{DD2} (200M)		10.40	16.64	mA	
	I _{DD1} (200M)		6.58	10.53	mA	V _{DD} = 3.3V
	I _{DD2} (200M)		6.58	10.53	mA	

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
CE08340M	$I_{DD1}(10M)$		0.24	0.36	mA	$V_{DD}=5V$
	$I_{DD2}(10M)$		1.76	2.63	mA	
	$I_{DD1}(10M)$		0.18	0.27	mA	$V_{DD}=3.3V$
	$I_{DD2}(10M)$		1.43	2.14	mA	
CE08341M	$I_{DD1}(10M)$		0.97	1.46	mA	$V_{DD}=5V$
	$I_{DD2}(10M)$		0.97	1.46	mA	
	$I_{DD1}(10M)$		0.77	1.16	mA	$V_{DD}=3.3V$
	$I_{DD2}(10M)$		0.77	1.16	mA	
CE08342M	$I_{DD1}(10M)$		0.97	1.60	mA	$V_{DD}=5V$
	$I_{DD2}(10M)$		0.97	1.60	mA	
	$I_{DD1}(10M)$		0.77	1.20	mA	$V_{DD}=3.3V$
	$I_{DD2}(10M)$		0.77	1.20	mA	

Fig. 1 Switching Time waveform measurement

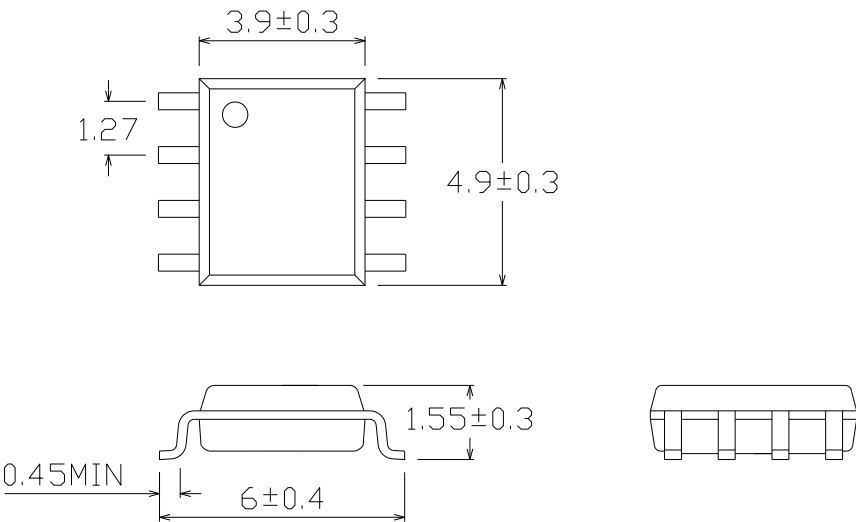
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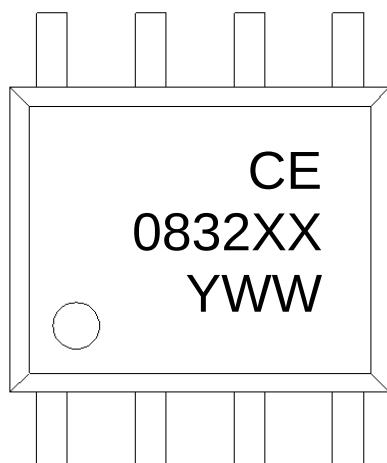
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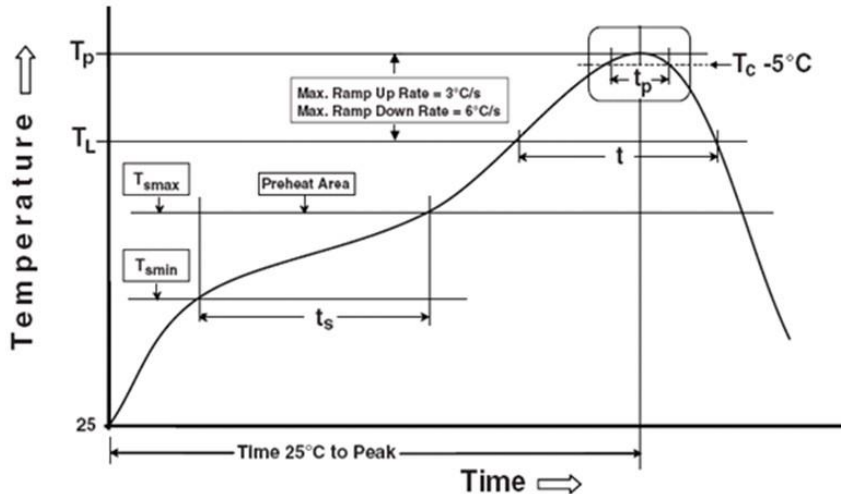
Option	Description	Packing quantity
(TA)	Surface mount lead form + TA tape & reel option	4000 units per reel

Package Dimension
(Dimensions in mm)



Device Marking**Notes**

CE	denotes EVERLIGHT
032XX	denotes Device Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code

Precautions for Use**1. Soldering Condition****1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile**

Note:

Reference: IPC/JEDEC J-STD-020D

Preheat

Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max

Other

Liquidus Temperature (T_L)	217 °C
Time above Liquidus Temperature (t_L)	60-100 sec
Peak Temperature (T_p)	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	3 times

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