DATASHEET

16SOP Quad-Channel Digital Isolators High Speed CEN834XXX-G Series

Preliminary

Features:

- Compliance Halogens Free
  (Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm)
- Data rate: 10M、200Mbps
- High robustness to radiated and conducted noise
- Isolation voltages 3000Vrms
- Human body model (HBM) ±8kV
- Wide temperature range: -40°C to 110°C

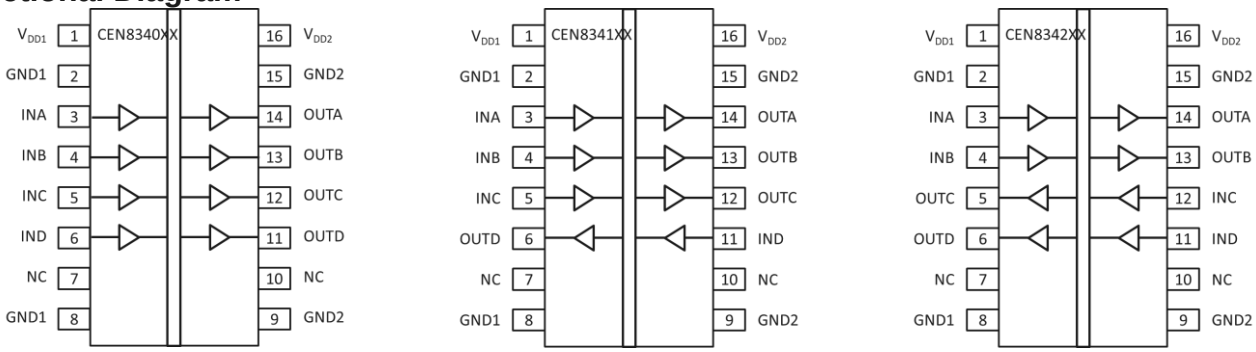
Description

The CEN834XXX-G are quad-channel digital isolators.
The CEN834XXX-G provides digital channel direction configuration and the default output level configuration when the input power is lost. Wide supply voltage of the CEN834XXX-G device supports to connect with most digital interface directly, easy to do the level shift.

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
	CEN8340XX	CEN8341XX	CEN8342XX	
V_{DD1}	1	1	1	Power supply, side 1
V_{DD2}	16	16	16	Power supply, side 2
GND1	2, 8	2, 8	2, 8	Ground , side 1
GND2	9,15	9,15	9,15	Ground , side 2
INA	3	3	3	Input, channel A
INB	4	4	4	Input, channel B
INC	5	5	12	Input, channel C
IND	6	11	11	Input, channel D
OUTA	14	14	14	Output, channel A
OUTB	13	13	13	Output, channel B
OUTC	12	12	5	Output, channel C
OUTD	11	6	6	Output, channel D
NC	7, 10	9,15	9,15	Not connected

Truth Table

V_{IX} Input	V_{DDI} State	V_{DDO} State	Default Low V_{OX} Output	Default High V_{OX} Output	Test Conditions /Comments
H	P	P	H	H	Normal operation
L	P	P	L	L	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_{DDO} 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}	6.5	V
Maximum Input Voltage	V_{IN}	V_{DDX}+0.5	V
Maximum Output Voltage	V_{OUT}	V_{DDX}+0.5	V
Output Current	I_O	10	mA
Isolation Voltage *1	V_{ISO}	3000	V rms
Operating Temperature	T_{OPR}	-40 ~ +110	°C
Storage Temperature	T_{STG}	-55 ~ +125	°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°C, unless otherwise noted.

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
High Level Input Voltage	V_{IH}		0.6*V_{DDX}	0.7*V_{DDX}	V	
Low Level Input Voltage	V_{IL}	0.3* V_{DDX}	0.4* V_{DDX}		V	
High Level Output Voltage	V_{OH}	V_{DDX}−0.1	V_{DDX}		V	I_O =-20uA
		V_{DDX}−0.2	V_{DDX}−0.1			I_O =-2mA
Low Level Output Voltage	V_{OL}		0	0.1	V	I_O =20uA
			0.1	0.2		I_O =2mA
Input Current per Signal Channel	I_{IN}	−10	0.5	10	μA	0 V ≤ Signal voltage ≤ 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} = 1000 V

Switching Characteristics - 5V Supply

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Minimum Pulse Width	PW			5	ns	for CEN834xEx
				100	nS	for CEN834xMx
Propagation Delay	t_{PLH}、t_{PLH}			16.5	nS	
Pulse Width Distortion	PWD			5	nS	
Part to Part Propagation Delay Skew	t_{PSK}			3	nS	
Channel-to-Channel Delay Skew	t_{CSK}			3	nS	
Rising Time	T_r		1.5		nS	
Falling Time	T_f		1.5		nS	

Switching Characteristics – 3.3V Supply

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Minimum Pulse Width	PW			5	ns	for CEN834xEx
				100	nS	for CEN834xMx
Propagation Delay	t_{PLH}、t_{PLH}			19	nS	
Pulse Width Distortion	PWD			5	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

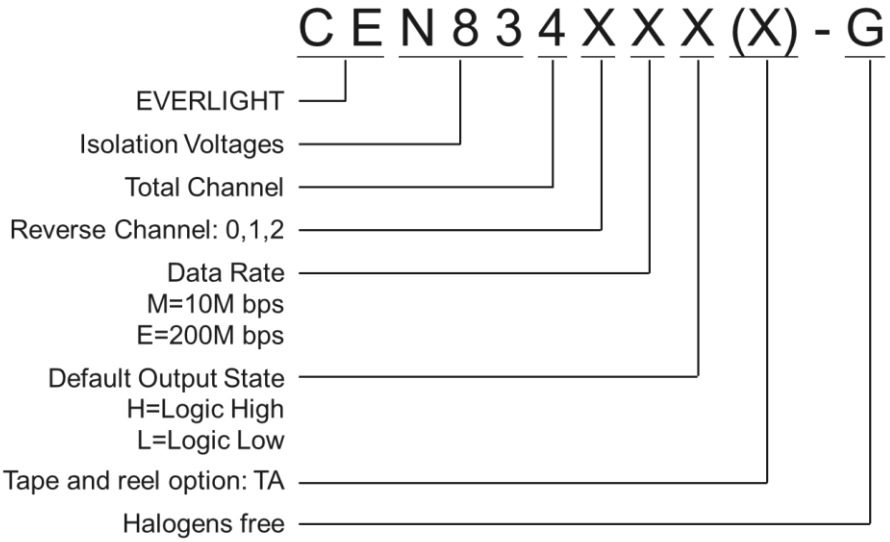
Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
CEN8340xx	I_{DD1}	0.11	0.13	0.21	mA	V_{DD}= 5V VI=0V for CEN8340xL VI=5V for CEN8340xH
	I_{DD2}	1.56	1.95	2.54	mA	
	I_{DD1}	0.32	0.39	0.51	mA	V_{DD}= 5V VI=5V for CEN8340xL VI=0V for CEN8340xH
	I_{DD2}	1.48	1.85	2.40	mA	
	I_{DD1}	0.10	0.16	0.21	mA	V_{DD}= 3.3V VI=0V for CEN8340xL VI=3.3V for CEN8340xH
	I_{DD2}	1.54	1.93	2.51	mA	
	I_{DD1}	0.23	0.29	0.38	mA	V_{DD}= 3.3V VI=3.3V for CEN8340xL VI=0V for CEN8340xH
	I_{DD2}	1.42	1.77	2.30	mA	
CEN8341xx	I_{DD1}	0.48	0.60	0.80	mA	V_{DD}= 5V VI=0V for CEN8341xL VI=5V for CEN8341xH
	I_{DD2}	1.20	1.50	1.95	mA	
	I_{DD1}	0.59	0.74	0.97	mA	V_{DD}= 5V VI=5V for CEN8341xL VI=0V for CEN8341xH
	I_{DD2}	1.17	1.47	1.91	mA	
	I_{DD1}	0.48	0.60	0.78	mA	V_{DD}= 3.3V VI=0V for CEN8341xL VI=3.3V for CEN8341xH
	I_{DD2}	1.19	1.48	1.93	mA	
	I_{DD1}	0.52	0.66	0.85	mA	V_{DD}= 3.3V VI=3.3V for CEN8341xL VI=0V for CEN8341xH
	I_{DD2}	1.12	1.40	1.82	mA	
CEN8342xx	I_{DD1}	0.84	1.05	1.36	mA	V_{DD}= 5V VI=0V for CEN8342xL VI=5V for CEN8342xH
	I_{DD2}	0.84	1.05	1.36	mA	
	I_{DD1}	0.87	1.09	1.42	mA	V_{DD}= 5V VI=5V for CEN8342xL VI=0V for CEN8342xH
	I_{DD2}	0.87	1.09	1.42	mA	
	I_{DD1}	0.83	1.04	1.35	mA	V_{DD}= 3.3V VI=0V for CEN8342xL VI=3.3V for CEN8342xH
	I_{DD2}	0.83	1.04	1.35	mA	
	I_{DD1}	0.82	1.02	1.33	mA	V_{DD}= 3.3V VI=3.3V for CEN8342xL VI=0V for CEN8342xH
	I_{DD2}	0.82	1.02	1.33	mA	

Supply Current- AC signal

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
CEN8340Mx	I_{DD1}(10M)		0.48	0.72	mA	V_{DD}= 5V
	I_{DD2}(10M)		3.52	5.28	mA	
	I_{DD1}(10M)		0.36	0.54	mA	V_{DD}= 3.3V
	I_{DD2}(10M)		2.86	4.29	mA	
CEN8341Mx	I_{DD1}(10M)		1.21	1.82	mA	V_{DD}= 5V
	I_{DD2}(10M)		2.73	4.10	mA	
	I_{DD1}(10M)		0.95	1.43	mA	V_{DD}= 3.3V
	I_{DD2}(10M)		2.20	3.30	mA	
CEN8342Mx	I_{DD1}(10M)		1.94	2.91	mA	V_{DD}= 5V
	I_{DD2}(10M)		1.94	2.91	mA	
	I_{DD1}(10M)		1.54	2.31	mA	V_{DD}= 3.3V
	I_{DD2}(10M)		1.54	2.31	mA	
CEN8340Ex	I_{DD1}(200M)		7.44	11.90	mA	V_{DD}= 5V
	I_{DD2}(200M)		34.40	55.04	mA	
	I_{DD1}(200M)		4.32	6.91	mA	V_{DD}= 3.3V
	I_{DD2}(200M)		22.28	35.65	mA	
CEN8341Ex	I_{DD1}(200M)		14.12	22.59	mA	V_{DD}= 5V
	I_{DD2}(200M)		27.60	44.16	mA	
	I_{DD1}(200M)		8.74	13.98	mA	V_{DD}= 3.3V
	I_{DD2}(200M)		12.72	28.35	mA	
CEN8342Ex	I_{DD1}(200M)		20.80	33.28	mA	V_{DD}= 5V
	I_{DD2}(200M)		20.80	33.28	mA	
	I_{DD1}(200M)		13.16	21.10	mA	V_{DD}= 3.3V
	I_{DD2}(200M)		13.16	21.10	mA	

Order Information

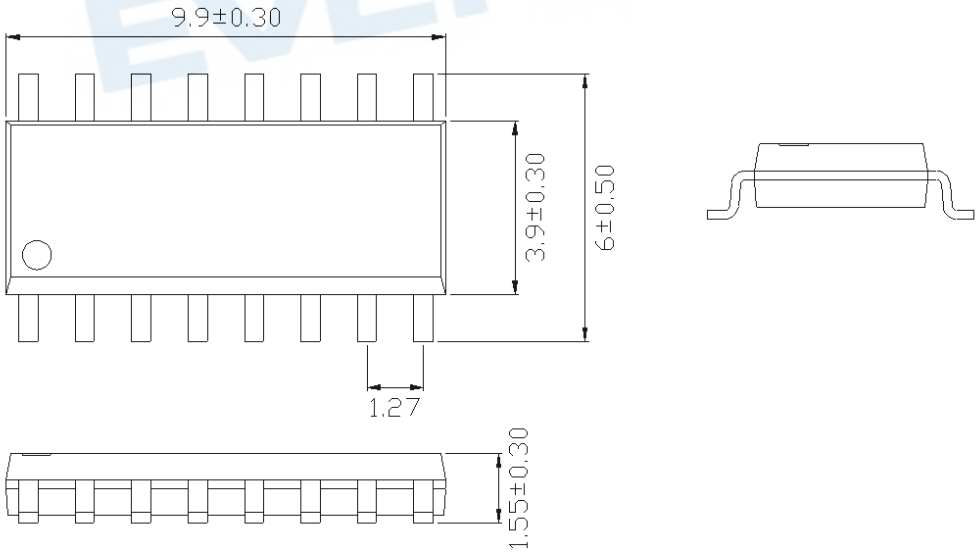
Part Number



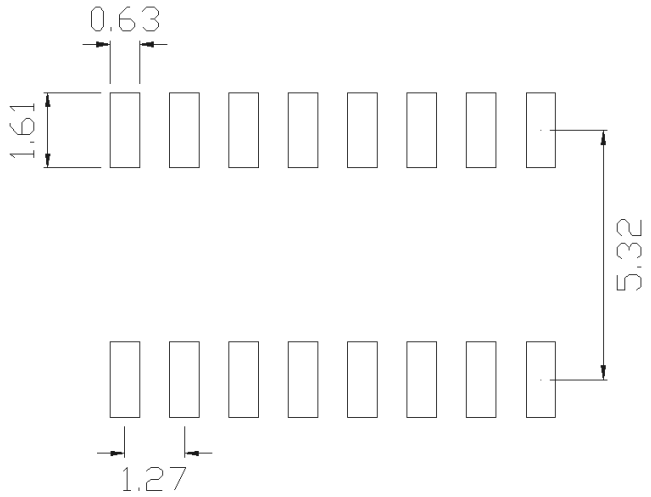
Option	Description	Packing quantity
(TA)	Surface mount lead form + TA tape & reel option	2500 units per reel

Package Dimension

(Dimensions in mm)

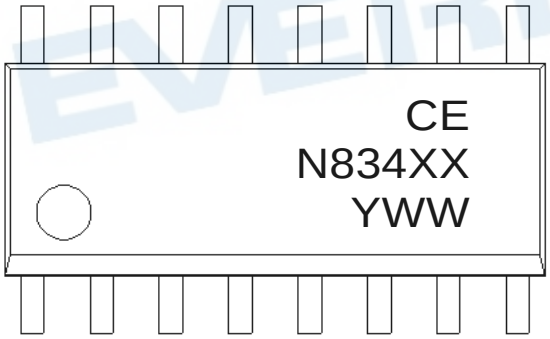


Recommended pad layout for surface mount leadform



Notes.
Suggested pad dimension is just for reference only.
Please modify the pad dimension based on individual need.

Device Marking



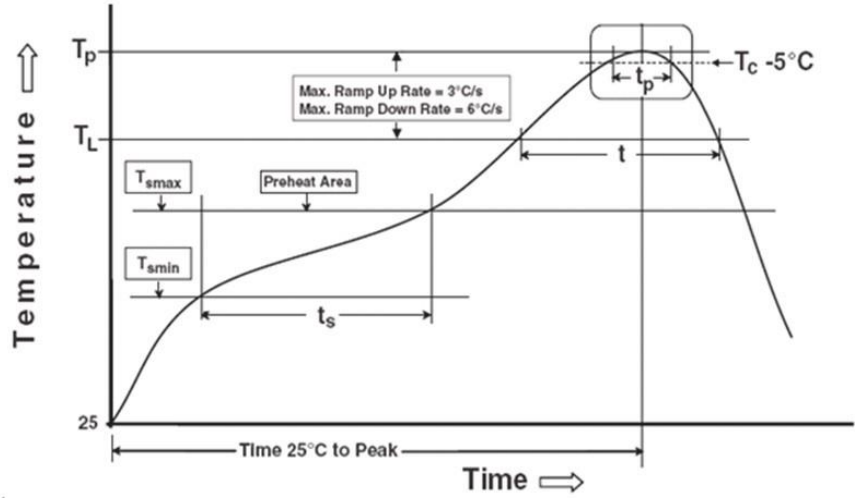
Notes

CE	denotes EVERLIGHT
N834XX	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°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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