

ISO7820 ISO7820F 高性能 8000 V_{PK} 增强型双通道数字隔离器

1 特性

- 信号传输速率：高达 100Mbps
- 宽电源范围：2.25V 至 5.5V
- 2.25V 至 5.5V 电平转换
- 宽温度范围：-55°C 至 125°C
- 低功耗，每通道电流典型值为 1.7mA（1Mbps 时）
- 低传播延迟：典型值 11ns（5V 电源供电时）
- 行业领先的 CMTI：±100kV/μs
- 优异的电磁兼容性 (EMC)
- 系统级静电放电 (ESD)、瞬态放电 (EFT) 以及抗浪涌保护
- 低辐射
- 隔离栅寿命：> 25 年
- 宽体 (DW) 小外形尺寸集成电路 (SOIC)-16 封装
- 安全及管理批准：中的安全及管理批准列表
 - 8000 V_{PK} V_{IOTM} 和 2121 V_{PK} V_{IORM} 增强型隔离，符合 DIN V VDE V 0884-10 (VDE V 0884-10):2006-12 标准
 - 符合 UL 1577 标准且长达 1 分钟的 5.7kV_{RMS} 隔离
 - CSA 组件接受通知 5A, IEC 60950-1、IEC 60601-1 和 IEC 61010-1 终端设备标准
 - 符合 GB4943.1-2011 的 CQC 认证

2 应用范围

- 工业自动化
- 电机控制
- 电源
- 太阳能逆变器
- 医疗设备
- 混合动力电动汽车

3 说明

ISO7820 是一款高性能双通道数字隔离器，隔离电压高达 8000 V_{PK}。该器件已通过符合 VDE、CSA 和 CQC 标准的增强型隔离认证。在隔离 CMOS 或者 LVCMOS 数字 I/O 时，该隔离器可提供高电磁抗扰度和低辐射，且具有低功耗特性。每个隔离通道的逻辑输入和输出缓冲器均由二氧化硅 (SiO₂) 绝缘栅栅分离开来。ISO7820 具有两个正向通道，但没有反向通道。如果出现输入功率或信号丢失，ISO7820 器件默认输出“高”电平，ISO7820F 器件默认输出“低”电平。更多详细信息与隔离式电源一起使用时，此器件可防止数据总线或者其它电路上的噪音电流进入本地接地，以及干扰或损坏敏感电路。凭借创新的芯片设计和布线技术，ISO7820 的电磁兼容性得到了显著增强，从而可确保提供系统级 ESD、EFT 和浪涌保护并符合辐射标准。ISO7820 采用 16 引脚 SOIC 宽体 (DW) 封装。

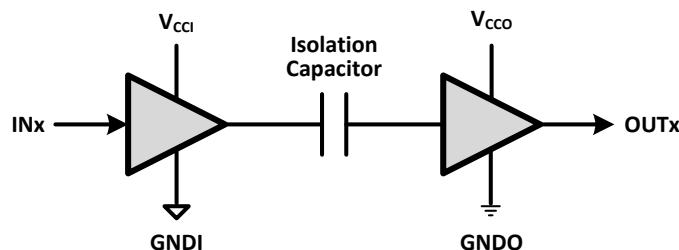
器件信息⁽¹⁾

器件型号	封装	封装尺寸 (标称值)
ISO7820/ ISO7820F	SOIC, DW (16)	10.30mm x 7.50mm

(1) 如需了解所有可用封装，请见数据表末尾的可订购产品附录。

中添加了注释 1 和 2

简化电路原理图



(1) V_{CCI} 和 GNDI 分别是输入通道的电源和接地连接。

(2) V_{CCO} 和 GNDO 分别是输出通道的电源和接地连接。



目录

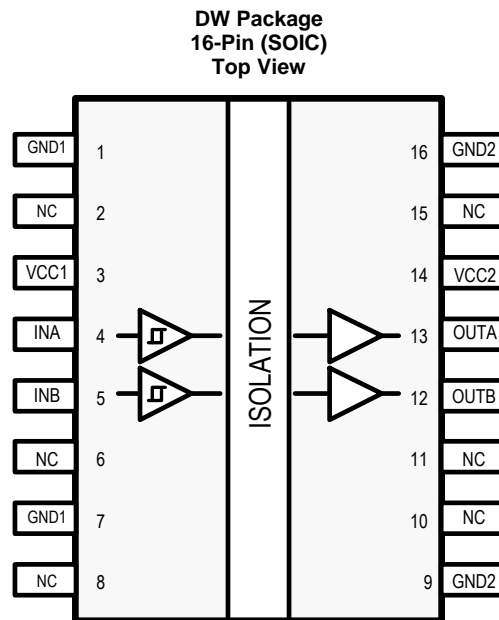
1	特性	1	8.1	Overview	10
2	应用范围	1	8.2	Functional Block Diagram	10
3	说明	1	8.3	Feature Description	11
4	修订历史记录	2	8.4	Device Functional Modes	15
5	Pin Configuration and Functions	3	9	Applications and Implementation	16
6	Specifications	4	9.1	Application Information	16
6.1	Absolute Maximum Ratings	4	9.2	Typical Application	16
6.2	ESD Ratings	4	10	Power Supply Recommendations	18
6.3	Recommended Operating Conditions	4	11	Layout	19
6.4	Thermal Information	5	11.1	PCB Material	19
6.5	Power Rating	5	11.2	Layout Guidelines	19
6.6	Electrical Characteristics, 5 V	5	11.3	Layout Example	19
6.7	Electrical Characteristics, 3.3 V	6	12	器件和文档支持	20
6.8	Electrical Characteristics, 2.5 V	6	12.1	文档支持	20
6.9	Switching Characteristics, 5 V	7	12.2	相关链接	20
6.10	Switching Characteristics, 3.3 V	7	12.3	社区资源	20
6.11	Switching Characteristics, 2.5 V	7	12.4	商标	20
6.12	Typical Characteristics	8	12.5	静电放电警告	20
7	Parameter Measurement Information	9	12.6	Glossary	20
8	Detailed Description	10	13	机械、封装和可订购信息	20

4 修订历史记录

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

日期	修订版本	注释
2015 年 7 月	*	最初发布版本。

5 Pin Configuration and Functions



Pin Functions

PIN		I/O	DESCRIPTION
NAME	NO. DW		
GND1	1, 7	–	Ground connection for V_{CC1}
GND2	9, 16	–	Ground connection for V_{CC2}
INA	4	I	Input, channel A
INB	5	I	Input, channel B
NC	2, 6, 8, 10, 11, 15	–	Not connected
OUTA	13	O	Output, channel A
OUTB	12	O	Output, channel B
VCC1	3	–	Power supply, V_{CC1}
VCC2	14	–	Power supply, V_{CC2}

6 Specifications

6.1 Absolute Maximum Ratings⁽¹⁾

		MIN	MAX	UNIT
Supply voltage ⁽²⁾	V_{CC1}, V_{CC2}	-0.5	6	V
Voltage	INx, OUTx	-0.5	$V_{CC} + 0.5^{(3)}$	V
Output Current	I_O	-15	15	mA
Surge Immunity			12.8	kV
Maximum junction temperature, T_J			150	°C
Storage temperature, T_{stg}		-65	150	°C

- (1) Stresses beyond those listed under *absolute maximum ratings* may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) All voltage values except differential I/O bus voltages are with respect to the local ground terminal (GND1 or GND2) and are peak voltage values.
- (3) Maximum voltage must not exceed 6 V.

6.2 ESD Ratings

		VALUE	UNIT	
V_{ESD}	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins ⁽¹⁾	±6000	V
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins ⁽²⁾	±1500	V

- (1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
- (2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

6.3 Recommended Operating Conditions

		MIN	TYP	MAX	UNIT
V_{CC1}, V_{CC2}	Supply voltage	2.25		5.5	V
I_{OH}	High-level output current	$V_{CCO}^{(1)} = 5\text{ V}$		-4	mA
		$V_{CCO} = 3.3\text{ V}$		-2	
		$V_{CCO} = 2.5\text{ V}$		-1	
I_{OL}	Low-level output current	$V_{CCO} = 5\text{ V}$		4	mA
		$V_{CCO} = 3.3\text{ V}$		2	
		$V_{CCO} = 2.5\text{ V}$		1	
V_{IH}	High-level input voltage	$0.7 \times V_{CCI}^{(1)}$		V_{CCI}	V
V_{IL}	Low-level input voltage	0		$0.3 \times V_{CCI}$	V
DR	Signaling rate	0		100	Mbps
T_J	Junction temperature ⁽²⁾	-55		150	°C
T_A	Ambient temperature	-55	25	125	°C

- (1) V_{CCI} = Input-side V_{CC} ; V_{CCO} = Output-side V_{CC} .
- (2) To maintain the recommended operating conditions for T_J , see the [Thermal Information](#) table.

6.4 Thermal Information

THERMAL METRIC		DW (16 Pins)	UNIT
$R_{\theta JA}$	Junction-to-ambient thermal resistance	84.7	°C/W
$R_{\theta JC(top)}$	Junction-to-case(top) thermal resistance	47.3	
$R_{\theta JB}$	Junction-to-board thermal resistance	49.4	
Ψ_{JT}	Junction-to-top characterization parameter	19.1	
Ψ_{JB}	Junction-to-board characterization parameter	48.8	
$R_{\theta JC(bottom)}$	Junction-to-case(bottom) thermal resistance	n/a	

6.5 Power Rating

		VALUE	UNIT
P_D	Maximum power dissipation by ISO7820	100	mW
P_{D1}	Maximum power dissipation by side-1 of ISO7820	20	
P_{D2}	Maximum power dissipation by side-2 of ISO7820	80	

$V_{CC1} = V_{CC2} = 5.5\text{ V}$, $T_J = 150^\circ\text{C}$,
 $C_L = 15\text{ pF}$, input a 50 MHz 50% duty cycle square wave

6.6 Electrical Characteristics, 5 V

 $V_{CC1} = V_{CC2} = 5\text{ V} \pm 10\%$ (over recommended operating conditions unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT	
V_{OH}	High-level output voltage	$I_{OH} = -4\text{ mA}$; see Figure 7	$V_{CCx}^{(1)} - 0.4$	$V_{CCx} - 0.2$		V	
V_{OL}	Low-level output voltage	$I_{OL} = 4\text{ mA}$; see Figure 7		0.2	0.4	V	
$V_{I(HYS)}$	Input threshold voltage hysteresis		$0.1 \times V_{CCx}^{(1)}$			V	
I_{IH}	High-level input current	$V_{IH} = V_{CCx}^{(1)}$ at INx			10	μA	
I_{IL}	Low-level input current	$V_{IL} = 0\text{ V}$ at INx	-10				
CMTI	Common-mode transient immunity	$V_I = V_{CCx}^{(1)}$ or 0 V; see Figure 9	70	100		kV/ μs	
I_{CC1}	Supply current, DC Signal	DC signal: $V_I = 0\text{ V}$ (Devices with suffix F), $V_I = V_{CCi}$ (Devices without suffix F)		0.9	1.3	mA	
I_{CC2}				1.2	1.8		
I_{CC1}	Supply current, DC Signal	DC signal: $V_I = V_{CCi}$ (Devices with suffix F), $V_I = 0\text{ V}$ (Devices without suffix F)		3.2	4.6		
I_{CC2}				1.3	2		
I_{CC1}	Supply current	1 Mbps	AC Signal: All channels switching with square wave clock input; $C_L = 15\text{ pF}$		2.1		3
I_{CC2}					1.3		2
I_{CC1}	Supply current	10 Mbps			2.1		3
I_{CC2}					2.3		3.8
I_{CC1}	Supply current	100 Mbps			2.7		3.3
I_{CC2}					11.9		15.3

(1) V_{CC1} = Input-side V_{CC} ; V_{CC0} = Output-side V_{CC} .

6.7 Electrical Characteristics, 3.3 V

 $V_{CC1} = V_{CC2} = 3.3 \text{ V} \pm 10\%$ (over recommended operating conditions unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT	
V_{OH}	High-level output voltage	$I_{OH} = -2 \text{ mA}$; see Figure 7	$V_{CCx}^{(1)} - 0.4$	$V_{CCx} - 0.2$		V	
V_{OL}	Low-level output voltage	$I_{OL} = 2 \text{ mA}$; see Figure 7		0.2	0.4	V	
$V_{I(HYS)}$	Input threshold voltage hysteresis		$0.1 \times V_{CCx}^{(1)}$			V	
I_{IH}	High-level input current	$V_{IH} = V_{CCx}^{(1)}$ at INx			10	μA	
I_{IL}	Low-level input current	$V_{IL} = 0 \text{ V}$ at INx	-10				
CMTI	Common-mode transient immunity	$V_1 = V_{CCx}^{(1)}$ or 0 V; see Figure 9	70	100		kV/μs	
I_{CC1}	Supply current, DC Signal	DC signal: $V_1 = 0 \text{ V}$ (Devices with suffix F) , $V_1 = V_{CC1}$ (Devices without suffix F)		0.9	1.3	mA	
I_{CC2}				1.2	1.8		
I_{CC1}	Supply current, DC Signal	DC signal: $V_1 = V_{CC1}$ (Devices with suffix F) , $V_1 = 0 \text{ V}$ (Devices without suffix F)		3.2	4.6		
I_{CC2}				1.3	2		
I_{CC1}	Supply current	1 Mbps	AC Signal: All channels switching with square wave clock input; $C_L = 15 \text{ pF}$		2.1		3
I_{CC2}					1.3		2
I_{CC1}	Supply current	10 Mbps			2.1		3
I_{CC2}					2.3		3.8
I_{CC1}	Supply current	100 Mbps			2.5		3.2
I_{CC2}					8.9		11.5

 (1) V_{CC1} = Input-side V_{CC} ; V_{CC0} = Output-side V_{CC} .

6.8 Electrical Characteristics, 2.5 V

 $V_{CC1} = V_{CC2} = 2.5 \text{ V} \pm 10\%$ (over recommended operating conditions unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT	
V_{OH}	High-level output voltage	$I_{OH} = -1 \text{ mA}$; see Figure 7	$V_{CCx}^{(1)} - 0.4$	$V_{CCx} - 0.2$		V	
V_{OL}	Low-level output voltage	$I_{OL} = 1 \text{ mA}$; see Figure 7		0.2	0.4	V	
$V_{I(HYS)}$	Input threshold voltage hysteresis		$0.1 \times V_{CCx}^{(1)}$			V	
I_{IH}	High-level input current	$V_{IH} = V_{CCx}^{(1)}$ at INx			10	μA	
I_{IL}	Low-level input current	$V_{IL} = 0 \text{ V}$ at INx	-10				
CMTI	Common-mode transient immunity	$V_1 = V_{CCx}^{(1)}$ or 0 V; see Figure 9	70	100		kV/μs	
I_{CC1}	Supply current, DC Signal	DC signal: $V_1 = 0 \text{ V}$ (Devices with suffix F) , $V_1 = V_{CC1}$ (Devices without suffix F)		0.9	1.3	mA	
I_{CC2}				1.2	1.8		
I_{CC1}	Supply current, DC Signal	DC signal: $V_1 = V_{CC1}$ (Devices with suffix F) , $V_1 = 0 \text{ V}$ (Devices without suffix F)		3.2	4.6		
I_{CC2}				1.3	2		
I_{CC1}	Supply current	1 Mbps	AC Signal: All channels switching with square wave clock input; $C_L = 15 \text{ pF}$		2.1		3
I_{CC2}					1.3		2
I_{CC1}	Supply current	10 Mbps			2.1		3
I_{CC2}					1.8		2.7
I_{CC1}	Supply current	100 Mbps			2.4		3.2
I_{CC2}					7		9.1

 (1) V_{CC1} = Input-side V_{CC} ; V_{CC0} = Output-side V_{CC} .

6.9 Switching Characteristics, 5 V

 $V_{CC1} = V_{CC2} = 5\text{ V} \pm 10\%$ (over recommended operating conditions unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH} , t_{PHL} Propagation delay time	See Figure 7	6	10.7	16	ns
PWD ⁽¹⁾ Pulse width distortion $ t_{PHL} - t_{PLH} $			0.6	4.6	
$t_{sk(pp)}$ ⁽²⁾ Part-to-part skew time				4.5	ns
t_r Output signal rise time	See Figure 7		2.4	3.9	ns
t_f Output signal fall time				2.4	
t_{fs} Default output delay time from input power loss	Measured from the time V_{CC} goes below 1.7 V. See Figure 8		0.2	9	μs
t_{ie} Time interval error	2^{16} - 1 PRBS data at 100 Mbps		1		ns

- (1) Also known as Pulse Skew.
(2) $t_{sk(pp)}$ is the magnitude of the difference in propagation delay times between any terminals of different devices switching in the same direction while operating at identical supply voltages, temperature, input signals and loads.

6.10 Switching Characteristics, 3.3 V

 $V_{CC1} = V_{CC2} = 3.3\text{ V} \pm 10\%$ (over recommended operating conditions unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH} , t_{PHL} Propagation delay time	See Figure 7	6	10.8	16	ns
PWD ⁽¹⁾ Pulse width distortion $ t_{PHL} - t_{PLH} $				0.7	
$t_{sk(pp)}$ ⁽²⁾ Part-to-part skew time				4.5	ns
t_r Output signal rise time	See Figure 7		1.3	3	
t_f Output signal fall time				1.3	3
t_{fs} Default output delay time from input power loss	Measured from the time V_{CC} goes below 1.7 V. See Figure 8		0.2	9	μs
t_{ie} Time interval error	2^{16} - 1 PRBS data at 100 Mbps		1		ns

- (1) Also known as Pulse Skew.
(2) $t_{sk(pp)}$ is the magnitude of the difference in propagation delay times between any terminals of different devices switching in the same direction while operating at identical supply voltages, temperature, input signals and loads.

6.11 Switching Characteristics, 2.5 V

 $V_{CC1} = V_{CC2} = 2.5\text{ V} \pm 10\%$ (over recommended operating conditions unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PLH} , t_{PHL} Propagation delay time	See Figure 7	7.5	11.7	17.5	ns
PWD ⁽¹⁾ Pulse width distortion $ t_{PHL} - t_{PLH} $				0.7	
$t_{sk(pp)}$ ⁽²⁾ Part-to-part skew time				4.5	ns
t_r Output signal rise time	See Figure 7		1.8	3.5	
t_f Output signal fall time				1.8	3.5
t_{fs} Default output delay time from input power loss	Measured from the time V_{CC} goes below 1.7 V. See Figure 8		0.2	9	μs
t_{ie} Time interval error	2^{16} - 1 PRBS data at 100 Mbps		1		ns

- (1) Also known as Pulse Skew.
(2) $t_{sk(pp)}$ is the magnitude of the difference in propagation delay times between any terminals of different devices switching in the same direction while operating at identical supply voltages, temperature, input signals and loads.

6.12 Typical Characteristics

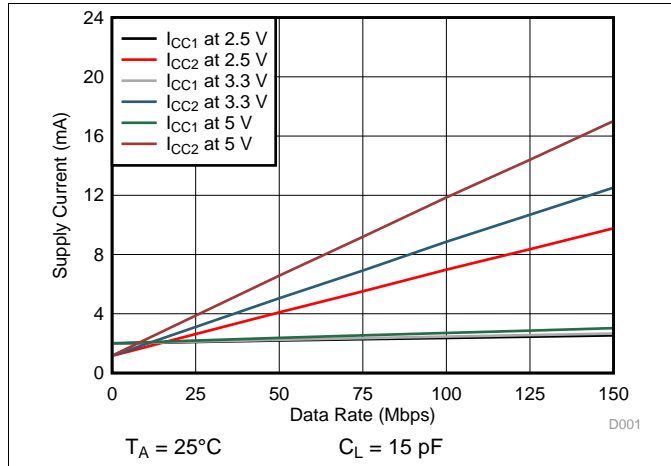


Figure 1. Supply Current vs Data Rate (with 15 pF Load)

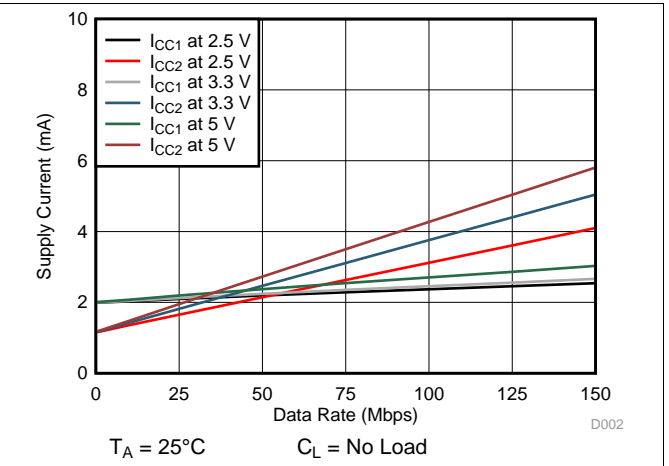


Figure 2. Supply Current vs Data Rate (with No Load)

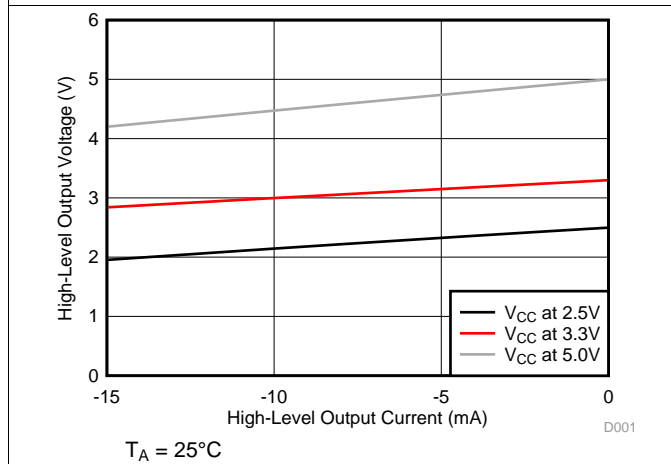


Figure 3. High-Level Output Voltage vs High-level Output Current

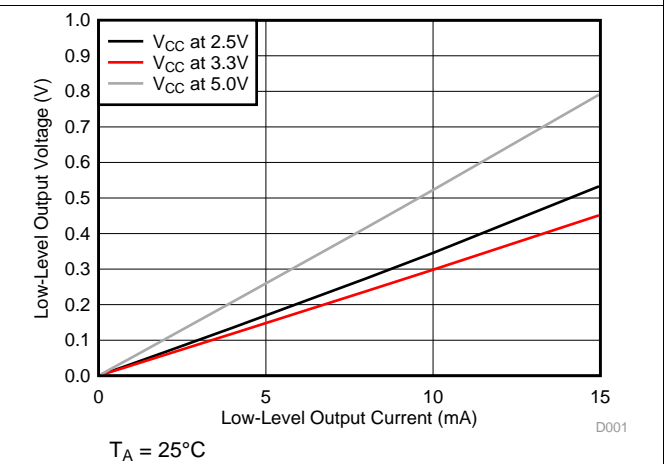


Figure 4. Low-Level Output Voltage vs Low-Level Output Current

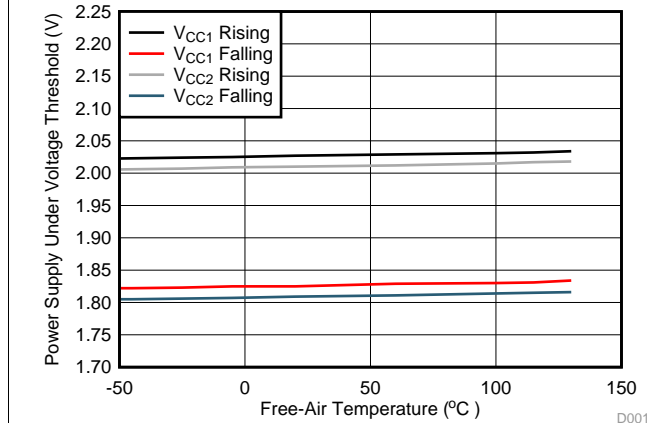


Figure 5. Power Supply Undervoltage Threshold vs Free-Air Temperature

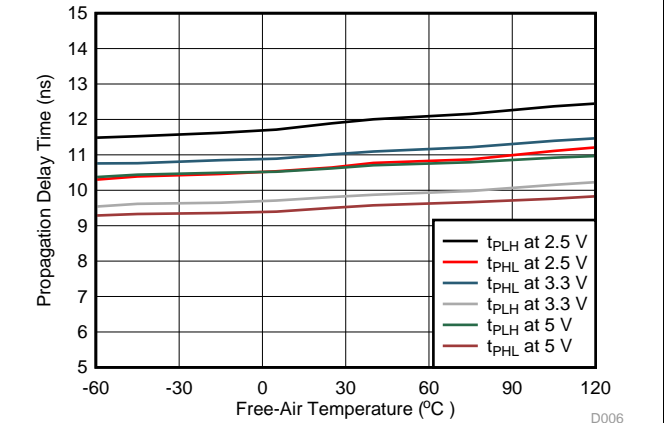
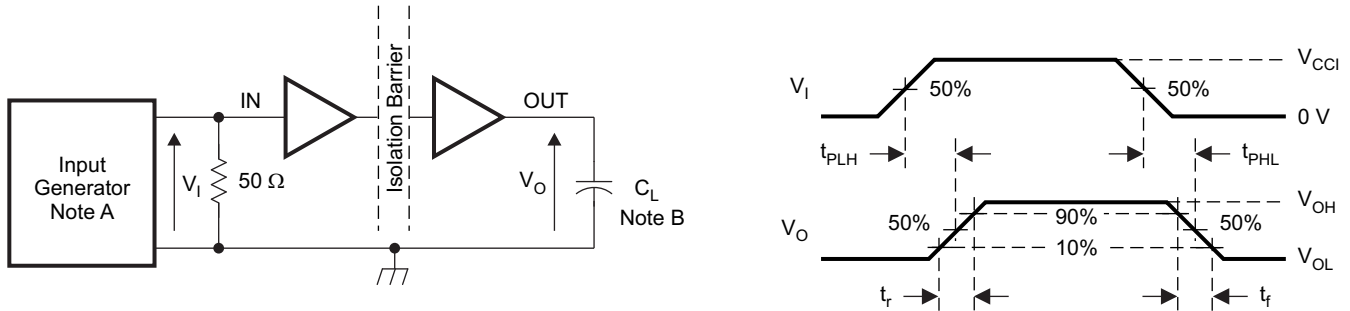


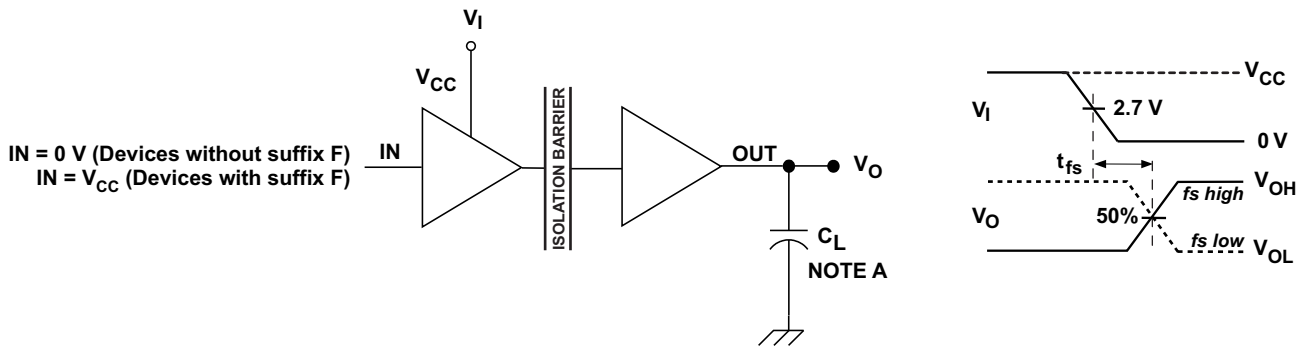
Figure 6. Propagation Delay Time vs Free-Air Temperature

7 Parameter Measurement Information



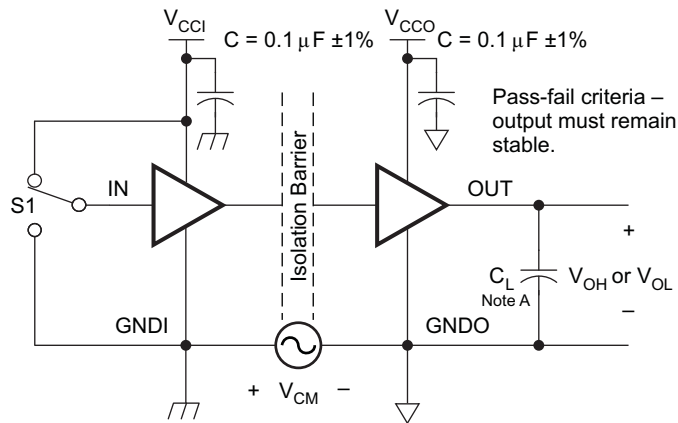
- A. The input pulse is supplied by a generator having the following characteristics: PRR \leq 50 kHz, 50% duty cycle, $t_r \leq$ 3 ns, $t_f \leq$ 3ns, $Z_O = 50 \Omega$. At the input, 50Ω resistor is required to terminate Input Generator signal. It is not needed in actual application.
- B. $C_L = 15$ pF and includes instrumentation and fixture capacitance within $\pm 20\%$.

Figure 7. Switching Characteristics Test Circuit and Voltage Waveforms



- A. $C_L = 15$ pF and includes instrumentation and fixture capacitance within $\pm 20\%$.

Figure 8. Default Output Delay Time Test Circuit and Voltage Waveforms



- A. $C_L = 15$ pF and includes instrumentation and fixture capacitance within $\pm 20\%$.

Figure 9. Common-Mode Transient Immunity Test Circuit

8 Detailed Description

8.1 Overview

ISO7820 employs an ON-OFF Keying (OOK) modulation scheme to transmit the digital data across a silicon dioxide based isolation barrier. The transmitter sends a high frequency carrier across the barrier to represent one digital state and sends no signal to represent the other digital state. The receiver demodulates the signal after advanced signal conditioning and produces the output through a buffer stage. These devices also incorporate advanced circuit techniques to maximize the CMTI performance and minimize the radiated emissions due to the high frequency carrier and IO buffer switching. The conceptual block diagram of a digital capacitive isolator, [Figure 10](#), shows a functional block diagram of a typical channel.

8.2 Functional Block Diagram

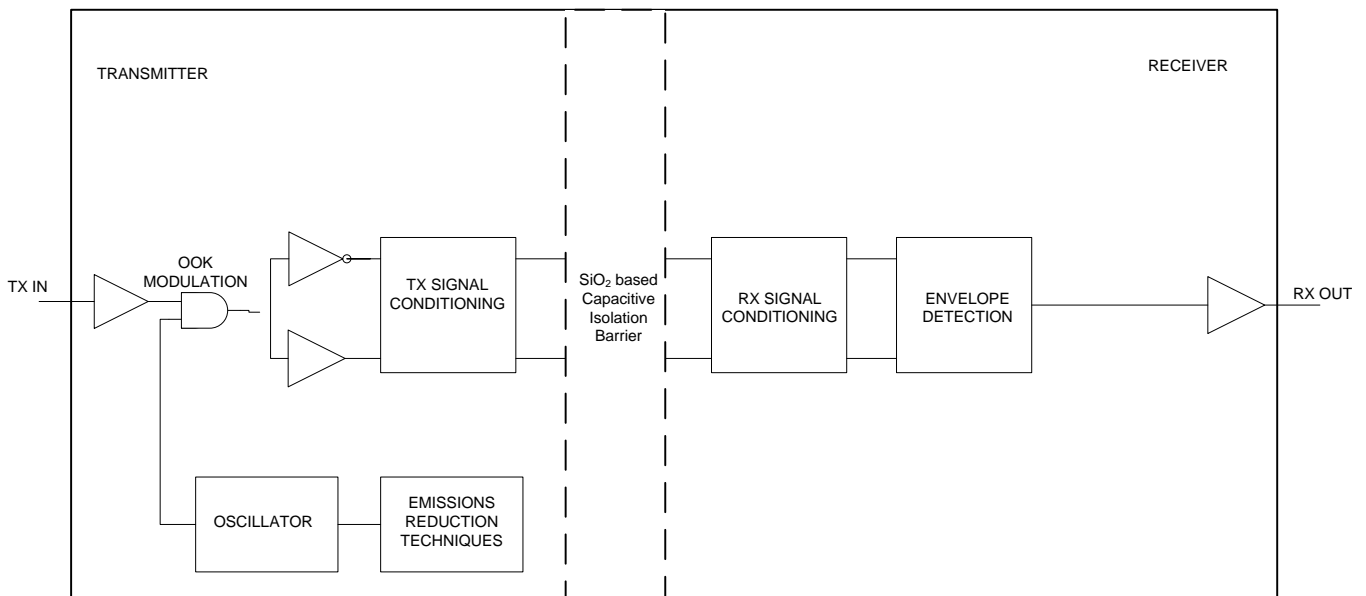


Figure 10. Conceptual Block Diagram of a Digital Capacitive Isolator

Also a conceptual detail of how the ON/OFF Keying scheme works is shown in [Figure 11](#).

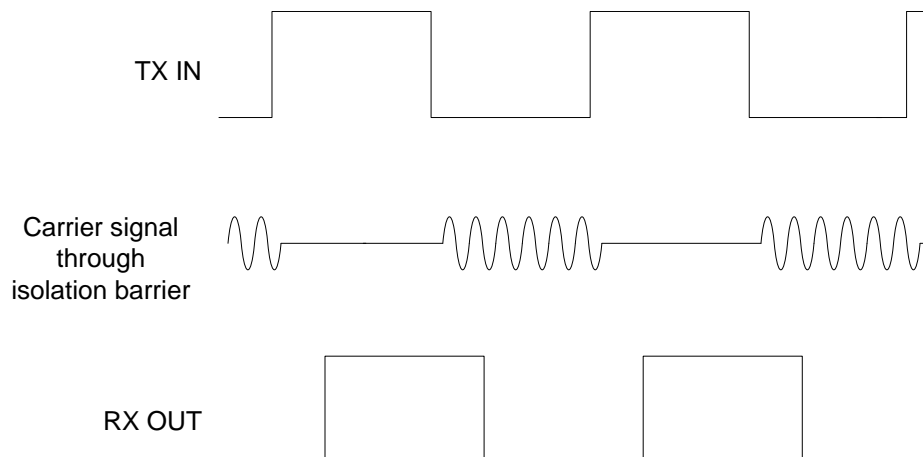


Figure 11. On-Off Keying (OOK) Based Modulation Scheme

8.3 Feature Description

ISO7820 is available in two channel configurations and default output state options to enable a variety of application uses.

PRODUCT	CHANNEL DIRECTION	RATED ISOLATION	MAX DATA RATE	DEFAULT OUTPUT
ISO7820	2 Forward, 0 Reverse	5700 V _{RMS} / 8000 V _{PK} ⁽¹⁾	100 Mbps	High
ISO7820F	2 Forward, 0 Reverse	5700 V _{RMS} / 8000 V _{PK} ⁽¹⁾	100 Mbps	Low

(1) See the [Regulatory Information](#) section for detailed isolation ratings.

8.3.1 High Voltage Feature Description

8.3.1.1 Package Insulation and Safety-Related Specifications

over recommended operating conditions (unless otherwise noted)

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
L(I01)	Minimum air gap (clearance)	Shortest terminal-to-terminal distance through air	DW-16	8		mm
L(I02) ⁽¹⁾	Minimum external tracking (creepage)	Shortest terminal-to-terminal distance across the package surface	DW-16	8		mm
CTI	Tracking resistance (comparative tracking index)	DIN EN 60112 (VDE 0303-11); IEC 60112; UL 746A		600		V
R _{IO}	Isolation resistance, input to output ⁽²⁾	V _{IO} = 500 V, T _A = 25°C		10 ¹²		Ω
		V _{IO} = 500 V, 100°C ≤ T _A ≤ max		10 ¹¹		Ω
C _{IO}	Barrier capacitance, input to output ⁽²⁾	V _{IO} = 0.4 x sin (2πft), f = 1 MHz		2		pF
C _I	Input capacitance ⁽³⁾	V _I = V _{CC} /2 + 0.4 x sin (2πft), f = 1 MHz, V _{CC} = 5 V		2		pF

(1) Per JEDEC package dimensions.

(2) All pins on each side of the barrier tied together creating a two-terminal device.

(3) Measured from input pin to ground.

NOTE

Creepage and clearance requirements should be applied according to the specific equipment isolation standards of an application. Care should be taken to maintain the creepage and clearance distance of a board design to ensure that the mounting pads of the isolator on the printed-circuit board do not reduce this distance.

Creepage and clearance on a printed-circuit board become equal in certain cases. Techniques such as inserting grooves and/or ribs on a printed circuit board are used to help increase these specifications.

8.3.1.2 Insulation Characteristics

PARAMETER ⁽¹⁾		TEST CONDITIONS	SPECIFICATION	UNIT
DTI	Distance through the insulation	Minimum internal gap (internal clearance)	21	μm
V _{IOWM}	Maximum isolation working voltage	Time dependent dielectric breakdown (TDDB) test	1500	V _{RMS}
			2121	V _{DC}
DIN V VDE V 0884-10 (VDE V 0884-10):2006-12				
V _{IOTM}	Maximum transient isolation voltage	V _{TEST} = V _{IOTM} t = 60 sec (qualification) t = 1 sec (100% production)	8000	V _{PK}
V _{IOSM}	Maximum surge isolation voltage	Test method per IEC 60065, 1.2/50 μs waveform, V _{TEST} = 1.6 x V _{IOSM} = 12800 V _{PK} (qualification)	8000	V _{PK}
V _{IORM}	Maximum repetitive peak isolation voltage		2121	V _{PK}
V _{PR}	Input-to-output test voltage	Method a, After Input/Output safety test subgroup 2/3, V _{PR} = V _{IORM} x 1.2, t = 10 s, Partial discharge < 5 pC	2545	V _{PK}
		Method a, After environmental tests subgroup 1, V _{PR} = V _{IORM} x 1.6, t = 10 s, Partial Discharge < 5 pC	3394	
		Method b1, After environmental tests subgroup 1, V _{PR} = V _{IORM} x 1.875, t = 1 s (100% Production test) Partial discharge < 5 pC	3977	
R _S	Isolation resistance	V _{IO} = 500 V at T _S	>10 ⁹	Ω
	Pollution degree		2	
UL 1577				
V _{ISO}	Withstanding isolation voltage	V _{TEST} = V _{ISO} = 5700 V _{RMS} , t = 60 sec (qualification); V _{TEST} = 1.2 x V _{ISO} = 6840 V _{RMS} , t = 1 sec (100% production)	5700	V _{RMS}

(1) Climatic Classification 55/125/21

8.3.1.3 IEC 60664-1 Ratings Table

PARAMETER		TEST CONDITIONS	SPECIFICATION
Basic isolation group		Material group	I
Installation classification	DW package	Rated mains voltage ≤ 600 V _{RMS}	I–IV
		Rated mains voltage ≤ 1000 V _{RMS}	I–III

8.3.1.4 Regulatory Information

DW package certifications are complete.

VDE	CSA	UL	CQC
Certified according to DIN V VDE V 0884-10 (VDE V 0884-10):2006-12 and DIN EN 60950-1 (VDE 0805 Teil 1):2011-01	Approved under CSA Component Acceptance Notice 5A, IEC 60950-1, IEC 61010-1, and IEC 60601-1	Recognized under UL 1577 Component Recognition Program	Certified according to GB 4943.1-2011
Reinforced insulation Maximum transient isolation voltage, 8000 V _{PK} ; Maximum repetitive peak isolation voltage, 2121 V _{PK} ; Maximum surge isolation voltage, 8000 V _{PK}	Reinforced insulation per CSA 61010-1-12 and IEC 61010-1 3rd Ed., 300 V _{RMS} max working voltage; Reinforced insulation per CSA 60950-1-07+A1+A2 and IEC 60950-1 2nd Ed., 800 V _{RMS} max working voltage (pollution degree 2, material group I); 2 MOPP (Means of Patient Protection) per CSA 60601-1:14 and IEC 60601-1 Ed. 3.1, 250 V _{RMS} (354 V _{PK}) max working voltage	Single protection, 5700 V _{RMS} ⁽¹⁾	Reinforced Insulation, Altitude ≤ 5000 m, Tropical Climate, 250 V _{RMS} maximum working voltage
Certificate number: 40040142	Master contract number: 220991	File number: E181974	Certificate number: CQC15001121716

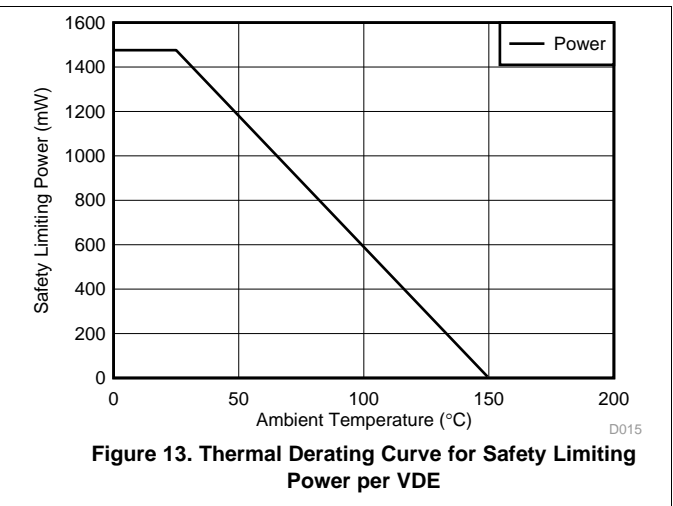
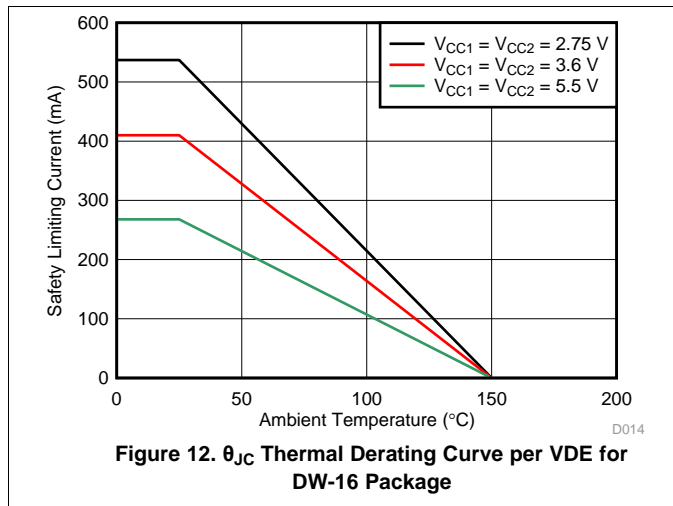
(1) Production tested ≥ 6840 V_{RMS} for 1 second in accordance with UL 1577.

8.3.1.5 Safety Limiting Values

Safety limiting intends to prevent potential damage to the isolation barrier upon failure of input or output circuitry. A failure of the I/O can allow low resistance to ground or the supply and, without current limiting, dissipate sufficient power to overheat the die and damage the isolation barrier potentially leading to secondary system failures.

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
I _S (DW-16)	Safety input, output, or supply current for DW-16 package	R _{θJA} = 84.7°C/W, V _I = 5.5 V, T _J = 150°C, T _A = 25°C			268	mA
		R _{θJA} = 84.7°C/W, V _I = 3.6 V, T _J = 150°C, T _A = 25°C			410	
		R _{θJA} = 84.7°C/W, V _I = 2.75 V, T _J = 150°C, T _A = 25°C			537	
P _S	Safety input, output, or total power	R _{θJA} = 84.7°C/W, T _J = 150°C, T _A = 25°C			1476	mW
T _S	Maximum case temperature				150	°C

The maximum safety temperature is the maximum junction temperature specified for the device. The power dissipation and junction-to-air thermal impedance of the device installed in the application hardware determines the junction temperature. The assumed junction-to-air thermal resistance in the [Thermal Information](#) is that of a device installed on a High-K test board for Leaded Surface Mount Packages. The power is the recommended maximum input voltage times the current. The junction temperature is then the ambient temperature plus the power times the junction-to-air thermal resistance.



8.4 Device Functional Modes

ISO7820DW functional modes are shown in Table 1.

Table 1. ISO7820DW Function Table⁽¹⁾

V _{CCI}	V _{CCO}	INPUT (IN _x) ⁽²⁾	OUTPUT (OUT _x)	COMMENTS
PU	PU	H	H	Normal Operation: A channel output assumes the logic state of its input.
		L	L	
		Open	Default	Default mode: When IN _x is open, the corresponding channel output goes to its default high logic state. Default= High for ISO7820 and Low for ISO7820F.
PD	PU	X	Default	Default mode: When V _{CCI} is unpowered, a channel output assumes the logic state based on the selected default option. Default= High for ISO7820 and Low for ISO7820F. When V _{CCI} transitions from unpowered to powered-up, a channel output assumes the logic state of its input. When V _{CCI} transitions from powered-up to unpowered, channel output assumes the selected default state.
X	PD	X	Undetermined	When V _{CCO} is unpowered, a channel output is undetermined ⁽³⁾ . When V _{CCO} transitions from unpowered to powered-up, a channel output assumes the logic state of its input

- (1) V_{CCI} = Input-side V_{CC}; V_{CCO} = Output-side V_{CC}; PU = Powered up (V_{CC} ≥ 2.25 V); PD = Powered down (V_{CC} ≤ 1.7 V); X = Irrelevant; H = High level; L = Low level
- (2) A strongly driven input signal can weakly power the floating V_{CC} via an internal protection diode and cause undetermined output.
- (3) The outputs are in undetermined state when 1.7 V < V_{CCI}, V_{CCO} < 2.25 V.

8.4.1 Device I/O Schematics

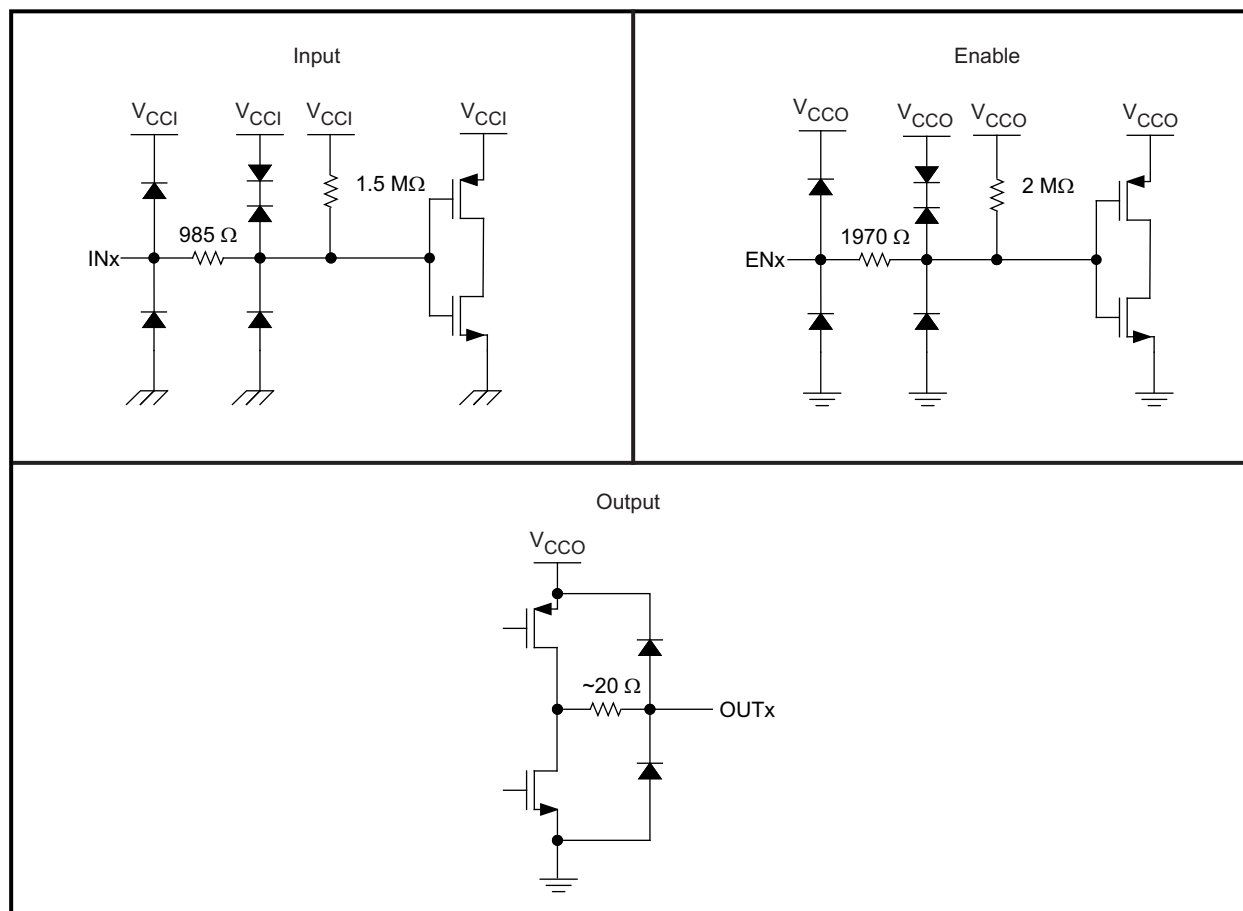


Figure 14. Device I/O Schematics

9 Applications and Implementation

NOTE

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes. Customers should validate and test their design implementation to confirm system functionality.

9.1 Application Information

The ISO7821 is a high-performance, dual-channel digital isolator with 5.7 kV_{RMS} isolation voltage. It utilizes single-ended CMOS-logic switching technology. Its supply voltage range is from 2.25 V to 5.5 V for both supplies, V_{CC1} and V_{CC2}. When designing with digital isolators, it is important to keep in mind that due to the single-ended design structure, digital isolators do not conform to any specific interface standard and are only intended for isolating single-ended CMOS or TTL digital signal lines. The isolator is typically placed between the data controller (that is, μ C or UART), and a data converter or a line transceiver, regardless of the interface type or standard.

9.2 Typical Application

ISO7820DW can be used with Texas Instruments' mixed signal micro-controller, digital-to-analog converter, transformer driver, and voltage regulator to create an isolated 4-20 mA current loop.

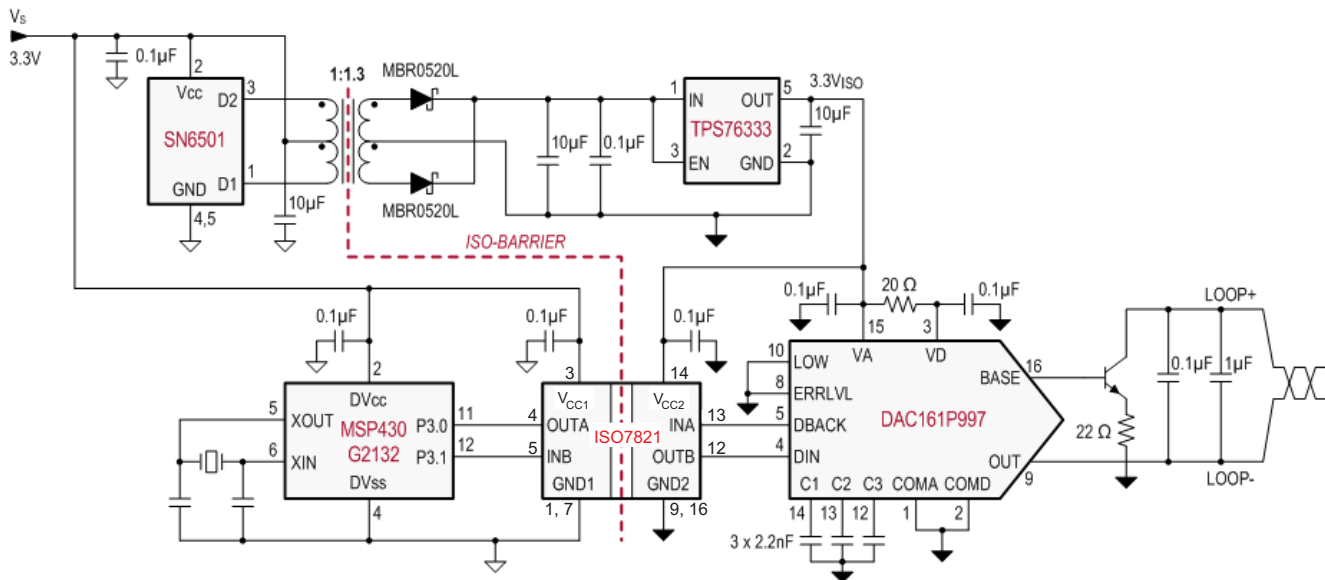


Figure 15. Isolated 4-20 mA Current Loop

9.2.1 Design Requirements

For the ISO7820, use the parameters shown in [Table 2](#).

Table 2. Design Parameters

PARAMETER	VALUE
Supply voltage	2.25 V to 5.5 V
Decoupling capacitor between V _{CC1} and GND1	0.1 μ F
Decoupling capacitor from V _{CC2} and GND2	0.1 μ F

9.2.2 Detailed Design Procedure

Unlike optocouplers, which need external components to improve performance, provide bias, or limit current, ISO7820 only needs two external bypass capacitors to operate.

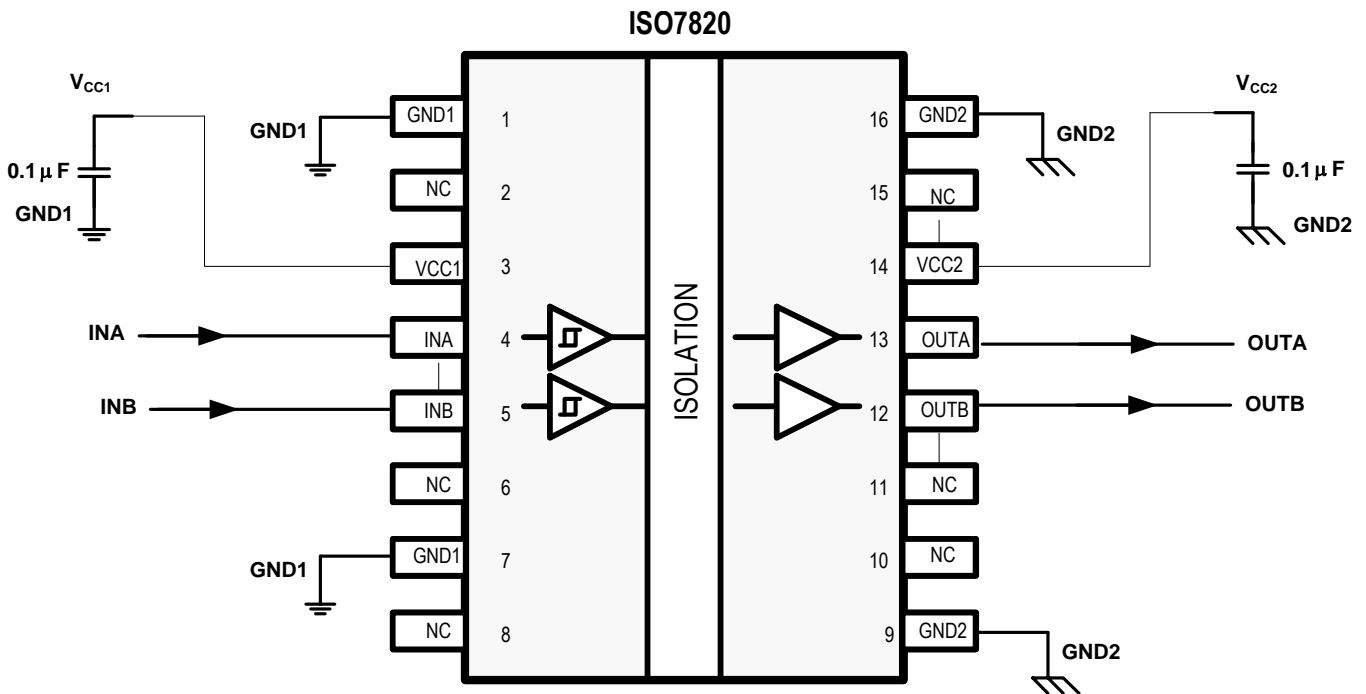


Figure 16. Typical ISO7820DW Circuit Hook-up

9.2.2.1 Electromagnetic Compatibility (EMC) Considerations

Many applications in harsh industrial environment are sensitive to disturbances such as electrostatic discharge (ESD), electrical fast transient (EFT), surge and electromagnetic emissions. These electromagnetic disturbances are regulated by international standards such as IEC 61000-4-x and CISPR 22. Although system-level performance and reliability depends, to a large extent, on the application board design and layout, the ISO7820 incorporate many chip-level design improvements for overall system robustness. Some of these improvements include:

- Robust ESD protection for input and output signal pins and inter-chip bond pads.
- Low-resistance connectivity of ESD cells to supply and ground pins.
- Enhanced performance of high voltage isolation capacitor for better tolerance of ESD, EFT and surge events.
- Bigger on-chip decoupling capacitors to bypass undesirable high energy signals through a low impedance path.
- PMOS and NMOS devices isolated from each other by using guard rings to avoid triggering of parasitic SCRs.
- Reduced common mode currents across the isolation barrier by ensuring purely differential internal operation.

9.2.3 Application Performance Curve

Typical eye diagram of ISO7820 indicate low jitter and wide open eye at the maximum data rate of 100 Mbps.

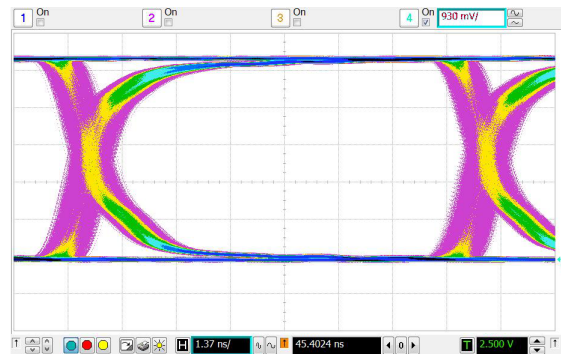


Figure 17. Eye Diagram at 100 Mbps PRBS, 5 V and 25°C

10 Power Supply Recommendations

To ensure reliable operation at all data rates and supply voltages, a 0.1 μF bypass capacitor is recommended at input and output supply pins (V_{CC1} and V_{CC2}). The capacitors should be placed as close to the supply pins as possible. If only a single primary-side power supply is available in an application, isolated power can be generated for the secondary-side with the help of a transformer driver such as Texas Instruments' [SN6501](#). For such applications, detailed power supply design and transformer selection recommendations are available in [SN6501](#) datasheet ([SLLSEA0](#)) .

11 Layout

11.1 PCB Material

For digital circuit boards operating below 150 Mbps, (or rise and fall times higher than 1 ns), and trace lengths of up to 10 inches, use standard FR-4 epoxy-glass as PCB material. FR-4 (Flame Retardant 4) meets the requirements of Underwriters Laboratories UL94-V0, and is preferred over cheaper alternatives due to its lower dielectric losses at high frequencies, less moisture absorption, greater strength and stiffness, and its self-extinguishing flammability-characteristics.

11.2 Layout Guidelines

A minimum of four layers is required to accomplish a low EMI PCB design (see [Figure 18](#)). Layer stacking should be in the following order (top-to-bottom): high-speed signal layer, ground plane, power plane and low-frequency signal layer.

- Routing the high-speed traces on the top layer avoids the use of vias (and the introduction of their inductances) and allows for clean interconnects between the isolator and the transmitter and receiver circuits of the data link.
- Placing a solid ground plane next to the high-speed signal layer establishes controlled impedance for transmission line interconnects and provides an excellent low-inductance path for the return current flow.
- Placing the power plane next to the ground plane creates additional high-frequency bypass capacitance of approximately 100 pF/in².
- Routing the slower speed control signals on the bottom layer allows for greater flexibility as these signal links usually have margin to tolerate discontinuities such as vias.

If an additional supply voltage plane or signal layer is needed, add a second power / ground plane system to the stack to keep it symmetrical. This makes the stack mechanically stable and prevents it from warping. Also the power and ground plane of each power system can be placed closer together, thus increasing the high-frequency bypass capacitance significantly.

For detailed layout recommendations, see Application Note [SLLA284](#), *Digital Isolator Design Guide*.

11.3 Layout Example

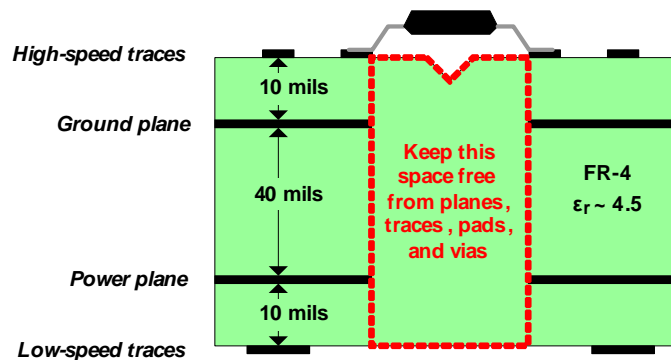


Figure 18. Layout Example

12 器件和文档支持

12.1 文档支持

12.1.1 相关文档

请参见 [隔离术语表 \(SLLA353\)](#)

12.2 相关链接

以下表格列出了快速访问链接。范围包括技术文档、支持与社区资源、工具和软件，并且可以快速访问样片或购买链接。

表 3. 相关链接

器件	产品文件夹	样片与购买	技术文档	工具与软件	支持与社区
ISO7820	请单击此处	请单击此处	请单击此处	请单击此处	请单击此处
ISO7820F	请单击此处	请单击此处	请单击此处	请单击此处	请单击此处

12.3 社区资源

The following links connect to TI community resources. Linked contents are provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

TI E2E™ Online Community *TI's Engineer-to-Engineer (E2E) Community*. Created to foster collaboration among engineers. At e2e.ti.com, you can ask questions, share knowledge, explore ideas and help solve problems with fellow engineers.

Design Support *TI's Design Support* Quickly find helpful E2E forums along with design support tools and contact information for technical support.

12.4 商标

E2E is a trademark of Texas Instruments.

12.5 静电放电警告



这些装置包含有限的内置 ESD 保护。存储或装卸时，应将导线一起截短或将装置放置于导电泡棉中，以防止 MOS 门极遭受静电损伤。

12.6 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

13 机械、封装和可订购信息

以下页中包括机械、封装和可订购信息。这些信息是针对指定器件可提供的最新数据。这些数据会在无通知且不对本文档进行修订的情况下发生改变。欲获得该数据表的浏览器版本，请查阅左侧的导航栏。

重要声明

德州仪器(TI)及其下属子公司有权根据 JESD46 最新标准,对所提供的产品和服务进行更正、修改、增强、改进或其它更改,并有权根据 JESD48 最新标准中止提供任何产品和服务。客户在下订单前应获取最新的相关信息,并验证这些信息是否完整且是最新的。所有产品的销售都遵循在订单确认时所提供的TI 销售条款与条件。

TI 保证其所销售的组件的性能符合产品销售时 TI 半导体产品销售条件与条款的适用规范。仅在 TI 保证的范围内,且 TI 认为有必要时才会使用测试或其它质量控制技术。除非适用法律做出了硬性规定,否则没有必要对每种组件的所有参数进行测试。

TI 对应用帮助或客户产品设计不承担任何义务。客户应对其使用 TI 组件的产品和应用自行负责。为尽量减小与客户产品和应用相关的风险,客户应提供充分的设计与操作安全措施。

TI 不对任何 TI 专利权、版权、屏蔽作品权或其它与使用了 TI 组件或服务的组合设备、机器或流程相关的 TI 知识产权中授予的直接或隐含权限作出任何保证或解释。TI 所发布的与第三方产品或服务有关的信息,不能构成从 TI 获得使用这些产品或服务的许可、授权、或认可。使用此类信息可能需要获得第三方的专利权或其它知识产权方面的许可,或是 TI 的专利权或其它知识产权方面的许可。

对于 TI 的产品手册或数据表中 TI 信息的重要部分,仅在没有对内容进行任何篡改且带有相关授权、条件、限制和声明的情况下才允许进行复制。TI 对此类篡改过的文件不承担任何责任或义务。复制第三方的信息可能需要服从额外的限制条件。

在转售 TI 组件或服务时,如果对该组件或服务参数的陈述与 TI 标明的参数相比存在差异或虚假成分,则会失去相关 TI 组件或服务的所有明示或暗示授权,且这是不正当的、欺诈性商业行为。TI 对任何此类虚假陈述均不承担任何责任或义务。

客户认可并同意,尽管任何应用相关信息或支持仍可能由 TI 提供,但他们将独立负责满足与其产品及其在应用中使用的 TI 产品相关的所有法律、法规和安全相关要求。客户声明并同意,他们具备制定与实施安全措施所需的全部专业技术和知识,可预见故障的危险后果、监测故障及其后果、降低有可能造成人身伤害的故障的发生机率并采取适当的补救措施。客户将全额赔偿因在此类安全关键应用中使用任何 TI 组件而对 TI 及其代理造成的任何损失。

在某些场合中,为了推进安全相关应用有可能对 TI 组件进行特别的促销。TI 的目标是利用此类组件帮助客户设计和创立其特有的可满足适用的功能安全性标准和要求的终端产品解决方案。尽管如此,此类组件仍然服从这些条款。

TI 组件未获得用于 FDA Class III (或类似的生命攸关医疗设备)的授权许可,除非各方授权官员已经达成了专门管控此类使用的特别协议。

只有那些 TI 特别注明属于军用等级或“增强型塑料”的 TI 组件才是设计或专门用于军事/航空应用或环境的。购买者认可并同意,对并非指定面向军事或航空航天用途的 TI 组件进行军事或航空航天方面的应用,其风险由客户单独承担,并且由客户独立负责满足与此类使用相关的所有法律和法规要求。

TI 已明确指定符合 ISO/TS16949 要求的产品,这些产品主要用于汽车。在任何情况下,因使用非指定产品而无法达到 ISO/TS16949 要求, TI 不承担任何责任。

	产品		应用
数字音频	www.ti.com.cn/audio	通信与电信	www.ti.com.cn/telecom
放大器和线性器件	www.ti.com.cn/amplifiers	计算机及周边	www.ti.com.cn/computer
数据转换器	www.ti.com.cn/dataconverters	消费电子	www.ti.com.cn/consumer-apps
DLP® 产品	www.dlp.com	能源	www.ti.com.cn/energy
DSP - 数字信号处理器	www.ti.com.cn/dsp	工业应用	www.ti.com.cn/industrial
时钟和计时器	www.ti.com.cn/clockandtimers	医疗电子	www.ti.com.cn/medical
接口	www.ti.com.cn/interface	安防应用	www.ti.com.cn/security
逻辑	www.ti.com.cn/logic	汽车电子	www.ti.com.cn/automotive
电源管理	www.ti.com.cn/power	视频和影像	www.ti.com.cn/video
微控制器 (MCU)	www.ti.com.cn/microcontrollers		
RFID 系统	www.ti.com.cn/rfidsys		
OMAP应用处理器	www.ti.com/omap		
无线连通性	www.ti.com.cn/wirelessconnectivity	德州仪器在线技术支持社区	www.deyisupport.com

邮寄地址: 上海市浦东新区世纪大道1568号, 中建大厦32楼邮政编码: 200122
Copyright © 2015, 德州仪器半导体技术(上海)有限公司

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
ISO7820DW	ACTIVE	SOIC	DW	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-55 to 125	ISO7820	Samples
ISO7820DWR	ACTIVE	SOIC	DW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-55 to 125	ISO7820	Samples
ISO7820DWW	ACTIVE	SOIC	DWW	16	45	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-3-260C-168 HR	-55 to 125	ISO7820	Samples
ISO7820DWWR	ACTIVE	SOIC	DWW	16	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-3-260C-168 HR	-55 to 125	ISO7820	Samples
ISO7820FDW	ACTIVE	SOIC	DW	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-55 to 125	ISO7820F	Samples
ISO7820FDWR	ACTIVE	SOIC	DW	16	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR	-55 to 125	ISO7820F	Samples
ISO7820FDWW	ACTIVE	SOIC	DWW	16	45	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-3-260C-168 HR	-55 to 125	ISO7820F	Samples
ISO7820FDWWR	ACTIVE	SOIC	DWW	16	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-3-260C-168 HR	-55 to 125	ISO7820F	Samples

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

Important Information and Disclaimer:The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

重要声明

德州仪器(TI) 及其下属子公司有权根据 JESD46 最新标准, 对所提供的产品和服务进行更正、修改、增强、改进或其它更改, 并有权根据 JESD48 最新标准中止提供任何产品和服务。客户在下订单前应获取最新的相关信息, 并验证这些信息是否完整且是最新的。所有产品的销售都遵循在订单确认时所提供的TI 销售条款与条件。

TI 保证其所销售的组件的性能符合产品销售时 TI 半导体产品销售条件与条款的适用规范。仅在 TI 保证的范围内, 且 TI 认为有必要时才会使用测试或其它质量控制技术。除非适用法律做出了硬性规定, 否则没有必要对每种组件的所有参数进行测试。

TI 对应用帮助或客户产品设计不承担任何义务。客户应对其使用 TI 组件的产品和应用自行负责。为尽量减小与客户产品和应用相关的风险, 客户应提供充分的设计与操作安全措施。

TI 不对任何 TI 专利权、版权、屏蔽作品权或其它与使用了 TI 组件或服务的组合设备、机器或流程相关的 TI 知识产权中授予的直接或间接权限制作出任何保证或解释。TI 所发布的与第三方产品或服务有关的信息, 不能构成从 TI 获得使用这些产品或服务的许可、授权、或认可。使用此类信息可能需要获得第三方的专利权或其它知识产权方面的许可, 或是 TI 的专利权或其它知识产权方面的许可。

对于 TI 的产品手册或数据表中 TI 信息的重要部分, 仅在没有对内容进行任何篡改且带有相关授权、条件、限制和声明的情况下才允许进行复制。TI 对此类篡改过的文件不承担任何责任或义务。复制第三方的信息可能需要服从额外的限制条件。

在转售 TI 组件或服务时, 如果对该组件或服务参数的陈述与 TI 标明的参数相比存在差异或虚假成分, 则会失去相关 TI 组件或服务的所有明示或暗示授权, 且这是不正当的、欺诈性商业行为。TI 对任何此类虚假陈述均不承担任何责任或义务。

客户认可并同意, 尽管任何应用相关信息或支持仍可能由 TI 提供, 但他们将独自负责满足与其产品及其应用中使用 TI 产品相关的所有法律、法规和安全相关要求。客户声明并同意, 他们具备制定与实施安全措施所需的全部专业技术和知识, 可预见故障的危险后果、监测故障及其后果、降低有可能造成人身伤害的故障的发生机率并采取适当的补救措施。客户将全额赔偿因在此类安全关键应用中使用任何 TI 组件而对 TI 及其代理造成的任何损失。

在某些场合中, 为了推进安全相关应用有可能对 TI 组件进行特别的促销。TI 的目标是利用此类组件帮助客户设计和创立其特有的可满足适用的功能安全性标准和要求的终端产品解决方案。尽管如此, 此类组件仍然服从这些条款。

TI 组件未获得用于 FDA Class III (或类似的生命攸关医疗设备) 的授权许可, 除非各方授权官员已经达成了专门管控此类使用的特别协议。

只有那些 TI 特别注明属于军用等级或“增强型塑料”的 TI 组件才是设计或专门用于军事/航空应用或环境的。购买者认可并同意, 对并非指定面向军事或航空航天用途的 TI 组件进行军事或航空航天方面的应用, 其风险由客户单独承担, 并且由客户独自负责满足与此类使用相关的所有法律和法规要求。

TI 已明确指定符合 ISO/TS16949 要求的产品, 这些产品主要用于汽车。在任何情况下, 因使用非指定产品而无法达到 ISO/TS16949 要求, TI 不承担任何责任。

	产品		应用
数字音频	www.ti.com.cn/audio	通信与电信	www.ti.com.cn/telecom
放大器和线性器件	www.ti.com.cn/amplifiers	计算机及周边	www.ti.com.cn/computer
数据转换器	www.ti.com.cn/dataconverters	消费电子	www.ti.com.cn/consumer-apps
DLP® 产品	www.dlp.com	能源	www.ti.com.cn/energy
DSP - 数字信号处理器	www.ti.com.cn/dsp	工业应用	www.ti.com.cn/industrial
时钟和计时器	www.ti.com.cn/clockandtimers	医疗电子	www.ti.com.cn/medical
接口	www.ti.com.cn/interface	安防应用	www.ti.com.cn/security
逻辑	www.ti.com.cn/logic	汽车电子	www.ti.com.cn/automotive
电源管理	www.ti.com.cn/power	视频和影像	www.ti.com.cn/video
微控制器 (MCU)	www.ti.com.cn/microcontrollers		
RFID 系统	www.ti.com.cn/rfidsys		
OMAP应用处理器	www.ti.com.cn/omap		
无线连通性	www.ti.com.cn/wirelessconnectivity	德州仪器在线技术支持社区	www.deyisupport.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2016, Texas Instruments Incorporated