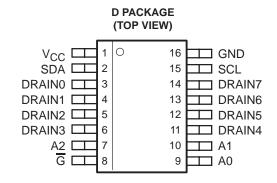
## TPIC2810 8-BIT LED DRIVER WITH I<sup>2</sup>C INTERFACE

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- Low r<sub>DS(on)</sub> . . . 5 Ω Typical
- Eight Power DMOS Transistor Outputs of 100-mA Continuous Current
- 210-mA Current Limit Capability
- Drain Output ESD Protection . . . 3000 V
- Output Clamp Voltage . . . 40 V

#### description

The TPIC2810 device is a monolithic, mediumvoltage, low-current, 8-bit shift register design to drive low-side switched resistive loads such as LEDs. The device is not recommended for switching inductive loads.



This device contains an 8-bit, serial-in, parallel-out shift register that feeds an 8-bit D-type storage register. Data transfers through the shift register via an  $I^2C$  bus interface. Data is transferred into the data shift register only after the group ID and device address have been verified. The subaddress directs the  $I^2C$  bus interface to read or write data to the device or transfer data to the output. When output enable  $(\overline{G})$  is held high, all drain outputs are off. When  $\overline{G}$  is held low, data from the output storage register is transparent to the output buffers. When data in the output buffers is low, the DMOS transistor outputs are off. When data is high, the DMOS transistor outputs have sink-current capability.

The TPIC2810 device has an internal power-up clear to initialize all registers to an off state when power is applied to the device. It also has a thermal sensor to monitor the die temperature and shut the drain outputs off, if an over current condition occurs.

Outputs are low-side, open-drain DMOS transistors with output ratings of 40 V and 100 mA continuous sink-current capability. Each output provides a 210-mA maximum current limit at  $T_C = 25^{\circ}C$ . The current limit decreases as the junction temperature increases for additional device protection. The device also provides up to 3000 V of ESD protection on output terminals and 2000 V of ESD protection on input terminals when tested using the human-body model.

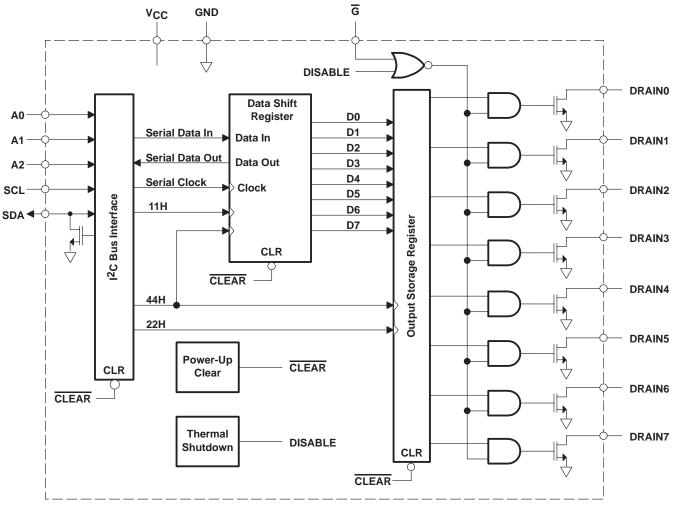
The TPIC2810 device is characterized for operation over the operating case temperature range of –40°C to 125°C.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.



## functional block diagram



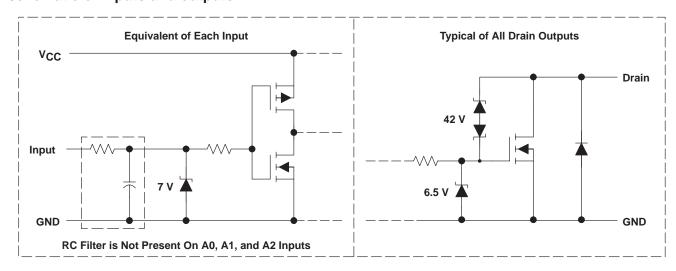
See the *TPIC2810* subaddress and *I*<sup>2</sup>C protocol definition section of this data sheet for definition of the 11H, 22H, and 44H control signals.



## **Terminal Functions**

TERMI	NAL		DECORPTION								
NAME	NO.	1/0	DESCRIPTION								
A0	9	I	Address input 0								
A1	10	Ι	Address input 1								
A2	7	-1	Address input 2								
DRAIN0	3										
DRAIN1	4										
DRAIN2	5										
DRAIN3	6	] _	ain outputs. The DRAIN terminals are low-side switches for resistive loads								
DRAIN4	11	0	drain outputs. The DRAIN terminals are low-side switches for resistive loads.								
DRAIN5	12										
DRAIN6	13										
DRAIN7	14										
G	8	- 1	Output enable. Active low input enables output FETs when low and disables output FETs when high.								
GND	16	0	Ground								
SCL	15	Ī	Serial clock								
SDA	2	I/O	Open drain, bidirectional serial data terminal								
VCC	1	Ι	Supply voltage input								

# schematic of inputs and outputs



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# absolute maximum ratings over the recommended operating case temperature range (unless otherwise noted)†

Logic supply voltage range, V <sub>CC</sub> (see Note 1)	7 V
Logic input voltage range, V <sub>I</sub>	0.3 V to 7 V
Power DMOS drain-to-source voltage, V <sub>DS</sub> (see Note 2)	40 V
Continuous source-to-drain diode anode current	210 mA
Pulsed source-to-drain diode anode current (see Note 3)	420 mA
Pulsed drain current, each output, all outputs on, I <sub>D</sub> , T <sub>C</sub> = 25°C (see Note 3)	210 mA
Peak drain current, single output, I <sub>DM</sub> , T <sub>C</sub> = 25°C (see Note 3)	
Continuous total dissipation	See Dissipation Rating Table
Operating virtual junction temperature range, T <sub>J</sub>	–40°C to 150°C
Operating case temperature range, T <sub>C</sub>	–40°C to 125°C
Storage temperature range, T <sub>stq</sub>	–65°C to 150°C

<sup>†</sup> 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.

NOTES: 1. All voltage values are with respect to GND.

- 2. Each power DMOS source is internally connected to GND.
- 3. Pulse duration  $\leq$  100  $\mu$ s and duty cycle  $\leq$  2%.

#### **DISSIPATION RATING TABLE**

PACKAGE	T <sub>C</sub> = 25°C	DERATING FACTOR	T <sub>C</sub> = 125°C
	POWER RATING	ABOVE T <sub>C</sub> = 25°C	POWER RATING
D	1087 mW	8.7 mW/°C	217 mW

## recommended operating conditions

	MIN	MAX	UNIT
Logic supply voltage, V <sub>CC</sub>	3.0	5.5	V
High-level input voltage, V <sub>IH</sub>	0.7V <sub>CC</sub>		V
Low-level input voltage, V <sub>IL</sub>		0.3 V <sub>CC</sub>	V
Pulse drain output current, T <sub>C</sub> = 25°C, V <sub>CC</sub> = 5 V, all outputs on (see Notes 3 and 4 and Figure 8)		210	mA
Operating case temperature, T <sub>C</sub>	-40	125	°C

- NOTES: 3. Pulse duration  $\leq$  100  $\mu$ s and duty cycle  $\leq$  2%.
  - 4. Technique must limit  $T_J T_C$  to  $10^{\circ} C$  maximum.



# TPIC2810 8-BIT LED DRIVER WITH I<sup>2</sup>C INTERFACE

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# electrical characteristics, $V_{CC}$ = 5 V, $T_{C}$ = 25°C (unless otherwise noted)

	PARAMETER	TEST COND	ITIONS	MIN	TYP	MAX	UNIT
Vcc	Logic supply voltage			3		5.5	V
V(BR)DSX	Drain-to-source breakdown voltage	$I_D = 1 \text{ mA}$		40			V
V <sub>SD</sub>	Source-to-drain diode forward voltage	IF = 100 mA			0.85	1.2	V
V <sub>PUC</sub>	Power-up clear voltage	V <sub>CC</sub> rising no load,	See Note 5			2.84	V
lіН	High-level input current	V <sub>CC</sub> = 5.5 V,	VI = VCC			1	μΑ
I <sub>I</sub> L	Low-level input current	$V_{CC} = 5.5 \text{ V},$	V <sub>I</sub> = 0			-1	μΑ
VHYS	Digital input hysteresis				1.1		V
	Lasia aumah, aumaat	V 55V	All outputs off		0.62	1	A
Icc	Logic supply current	V <sub>CC</sub> = 5.5 V	All outputs on		0.7	1	mA
I <sub>CC(FRQ)</sub>	Logic supply current at frequency	f <sub>SCL</sub> = 100 kHz, All outputs off,	C <sub>L</sub> = 30 pF, See Figure 3		0.74	1	mA
loL	Low level output current; SDA	V <sub>OL</sub> = 0.4 V			13		mA
IL	Leakage current; SDA	VI = VCC		-1		1	μΑ
IN	Nominal current	$V_{DS(on)} = 0.5 \text{ V},$ $T_{C} = 85^{\circ}C,$	I <sub>N</sub> = I <sub>D</sub> , See Notes 4, 6, 7		75		mA
	Off state desire summer.	V <sub>DS</sub> = 30 V	V 55V		0.3	0.6	
IDSX	Off-state drain current	$V_{DS} = 30 \text{ V}, T_{C} = 125^{\circ}\text{C}$	V <sub>CC</sub> = 5.5 V		0.3	0.6	μΑ
T <sub>TSD</sub>	Thermal shutdown set points			160			°C
THYS	Thermal shutdown hysteresis			10	20	30	°C
		$I_D = 100 \text{ mA}, V_{CC} = 3 \text{ V}$			8.0	10.8	
		$I_D = 100 \text{ mA}, V_{CC} = 4.5 \text{ V}$			5.1	6.9	
rDS(on)	Static drain-source on-state resistance	$I_D = 100 \text{ mA}, V_{CC} = 3.0 \text{ V},$ $T_C = 125^{\circ}\text{C}$	See Notes 4 and 6 and Figures 4 and 5		13.0	18.2	Ω
		$I_D$ = 100 mA, $V_{CC}$ = 4.5 V, $T_C$ = 125°C		_	8.0	11.2	

NOTES: 4. Technique must limit  $T_J - T_C$  to 10°C maximum

- 5. The power-up clear resets the I<sup>2</sup>C interface and clears all outputs.
- 6. These parameters are measured with voltage-sensing contacts separate from the current-carrying contacts.
- 7. Nominal current is defined for a consistent comparison between devices from different sources. It is the current that produces a voltage of 0.5 V at T<sub>C</sub> = 85°C.

# TPIC2810 8-BIT LED DRIVER WITH I<sup>2</sup>C INTERFACE

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# switching characteristics, $V_{CC}$ = 5 V, $T_{C}$ = 25°C, $C_{L}$ = 100 pF (unless otherwise noted)

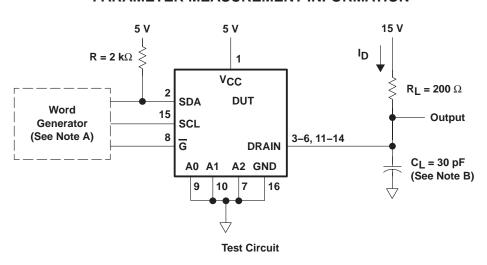
	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<sup>t</sup> PLH	Propagation delay time, low-to-high-level output from G	C <sub>L</sub> = 30 pF,		1.15		
tPHL	Propagation delay time, high-to-low-level output from G	$I_D = 75 \text{ mA},$		0.64		μs
tr(OUT)	Rise time, drain output	See Figures 1, 2, and 6		1.05		
t <sub>f</sub> (OUT)	Fall time, drain output	7		0.89		μs
,					100	
f(SCL)	Serial clock frequency				400	kHz
(002)					2	MHz
	B ( )	SCL = 100 kHz	4.7			
t(BUF)	Bus free time between stop and start condition	SCL = 400 kHz	1.3			μs
t(SP)	Tolerable spike width on bus				50	ns
tpd(ACK)	SCL low to data out valid (acknowledge)			120		ns
,		SCL = 100 kHz	4.7			
tLOW	SCL low time	SCL = 400 kHz	1.3			μs
		SCL = 2 MHz	250			ns
		SCL = 100 kHz	4.0			μs
tHIGH	SCL high time	SCL = 400 kHz	600			
	-	SCL = 2 MHz	200			ns
		SCL = 100 kHz	250			
tsu(DAT)	$SDA \rightarrow SCL$ setup time	SCL = 400 kHz	100			ns
04(2711)	·	SCL = 2 MHz	10			
		SCL = 100 kHz	4.7			μs
tsu(STA)	Start condition setup time	SCL = 400 kHz	600			-
04(01)1)	·	SCL = 2 MHz	300			ns
		SCL = 100 kHz	4			μs
tsu(STO)	Stop condition setup time	SCL = 400 kHz	600			
00(0.0)		SCL = 2 MHz	140			ns
th(DAT)	$SDA \rightarrow SCL$ hold time		50			ns
7		SCL = 100 kHz	4			μs
th(STA)	Start condition hold time	SCL = 400 kHz	600			ns
(- )		SCL = 2 MHz	160			ns
		SCL = 100 kHz			1000	
tr(SCL)	Rise time of SCL signal	SCL = 400 kHz	1		300	ns
.(002)	Ç	SCL = 2 MHz			70	
		SCL = 100 kHz			300	
t <sub>f</sub> (SCL)	Fall time of SCL signal	SCL = 400 kHz			300	ns
.(001)	-	SCL = 2 MHz			70	
		SCL = 100 kHz			1000	
tr(SDA)	Rise time of SDA signal	SCL = 400 kHz			300	ns
	- -	SCL = 2 MHz	1		70	
		SCL = 100 kHz			300	
tf(SDA)	Fall time of SDA signal	SCL = 400 kHz			300	ns
.(02/1)	•	SCL = 2 MHz			140	

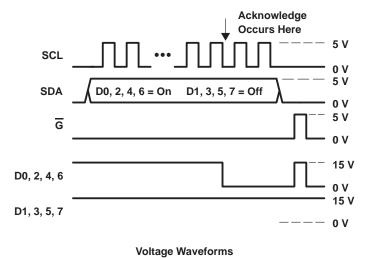


## thermal resistance

	PARAMETER	TEST CONDITIONS	MIN M	٨X	UNIT
$R_{\theta JA}$	Junction-to-ambient thermal resistance	All 8 outputs with equal power	1	15	°C/W

## PARAMETER MEASUREMENT INFORMATION



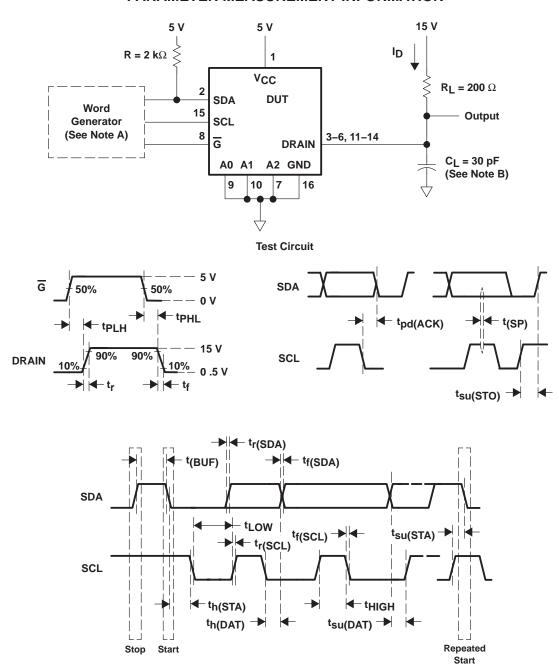


NOTES: A. The word generator has the following characteristics:  $t_{\Gamma} \le 30$  ns,  $t_{f} \le 30$  ns, pulsed repetition rate (PRR) = 400 kHz,  $Z_{O}$  = 50  $\Omega$ .

B. C<sub>L</sub> includes probe and jig capacitance.

Figure 1. Resistive-Load Test Circuit and Voltage Waveforms

## PARAMETER MEASUREMENT INFORMATION



NOTES: A. The word generator has the following characteristics:  $t_{\Gamma} \le 30$  ns,  $t_{f} \le 30$  ns, pulsed repetition rate (PRR) = 400 kHz,  $Z_{O} = 50 \ \Omega$ . B.  $C_{L}$  includes probe and jig capacitance.

Figure 2. Test Circuit, Switching Times and Voltage Waveforms



## **TYPICAL CHARACTERISTICS**

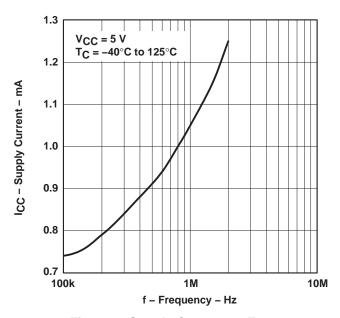


Figure 3. Supply Current vs Frequency

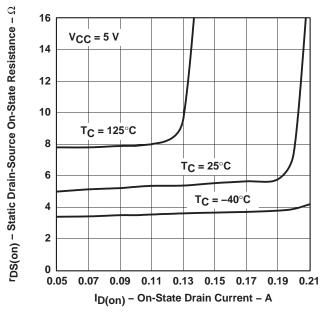


Figure 4. Static Drain-Source On-State Resistance vs On-State Drain Current

## TYPICAL CHARACTERISTICS

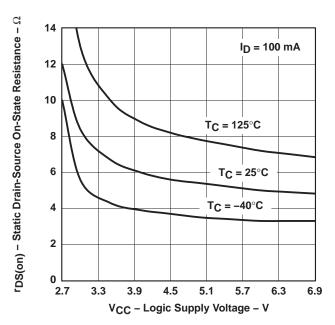


Figure 5. Static Drain-Source On-State Resistance vs Logic Supply Voltage

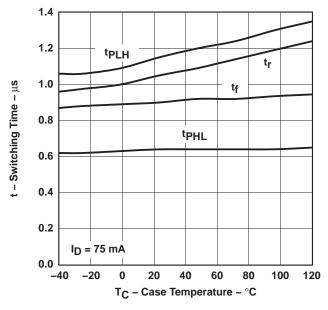


Figure 6. Switching Time vs Case Temperature



## **TYPICAL CHARACTERISTICS**

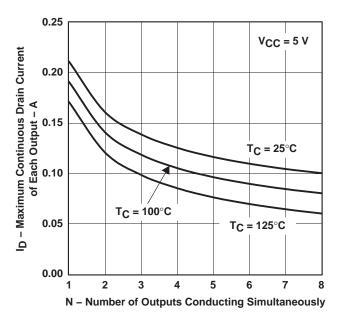


Figure 7. Maximum Continuous Drain Current Of Each Output vs Number Of Outputs Conducting Simultaneously

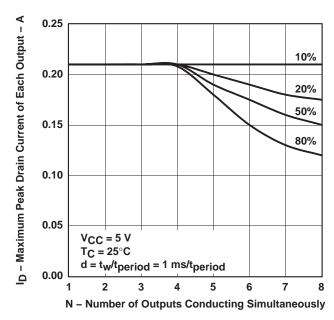
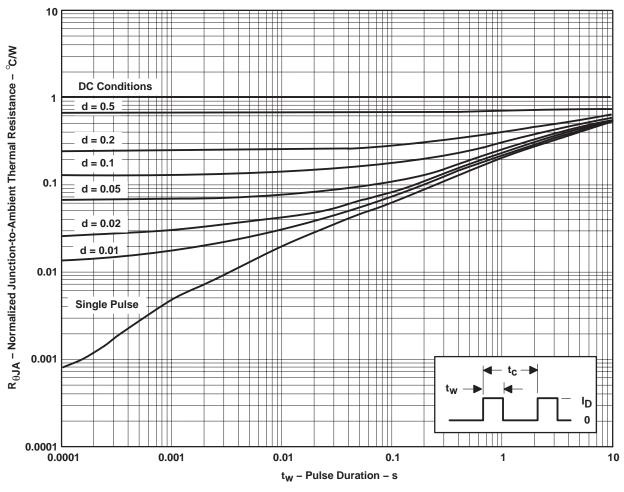


Figure 8. Maximum Peak Drain Current Of Each Output vs Number Of Outputs Conducting Simultaneously

#### THERMAL INFORMATION

## D PACKAGE†



† Device mounted on FR4 printed-circuit board with no heat sink

 $\begin{aligned} \text{NOTES:} \quad Z_{\theta A}(t) &= r(t) \; R_{\theta JA} \\ \quad t_W &= \text{pulse duration} \\ \quad t_C &= \text{cycle time} \\ \quad d &= \text{duty cycle} = t_W/t_C \end{aligned}$ 

Figure 9. Normalized Junction-to-Ambient Thermal Resistance vs Pulse Duration



## TPIC2810 subaddress and I<sup>2</sup>C protocol definition

## subaddress definition:

#### **Summary:**

HEX	R/W	
Value	Bit	Function
11H	1	Read data from the input register
11H	0	Write data to the data shift register, do not transfer to output register
22H	0	Command to transfer data from the data shift register to the output storage register
44H	0	Write data to the data shift register and transfer it to the output storage register immediately (extra load 22H command not needed)
Other	Х	No action on undefined subaddresses

All other undefined subaddress values are not acknowledged.

#### register definition:

- The data shift register receives serial data from the I<sup>2</sup>C interface.
- The data shift register receives data from the input interface and holds it until it is transferred to the output storage register.
- The output storage register controls whether the FET is on or off.

## TPIC2810 I<sup>2</sup>C input interface protocol definition

	 	;	Slave	e Ado	dress	s and	d R/V	V		 			Sub	addı	ress				 				Data	l				l I			
S	G3	G2	G1	G0	A2	A1	A0	RW	Α	S7 S6 S5 S4 S3 S2 S1 S0 A E									D7	D6	D5	D4	D3	D3 D2 D1 D0 A							

S Start Condition
G Group ID: Defined as 1100
A(0:2) Device Address Selectable Via Input Terminals
RW Read/Write Select Bit
A Acknowledge
Subaddress Defined Per Subaddress Table
Data Data to Be Loaded Into the Shift and Output Registers

P Stop Condition



## Case 1: Read/Write serial data, but do not load output register

This case loads the data shift register with data via the I<sup>2</sup>C interface. Data is not transferred to the output storage register.

#### write operation:

		SI	ave /	Addr	ess a	and I	R/W	= 0		 		S	ubac	dres	ss 11	Н			 			Data	to S	lave	!							
s	G3	G2	G1	G0	A2	A1	A0	RW	Α	S7 S6 S5 S4 S3 S2 S1 S0 A D									D7	D6	D5	D4	D3	D2	D2 D1 D0 A I							
	1																															

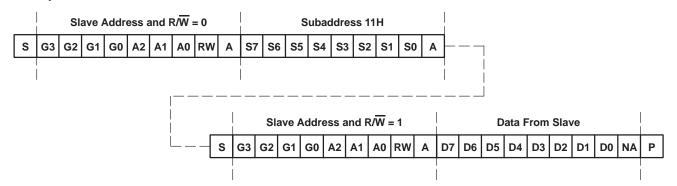
G[3:0]: Fixed at 1100

A[2:0]: Selectable Via Input Terminals RW: 0 = Write Shift Register Subaddress: 11H (0001 0001)

Data: Output Data to the TPIC2810 Device

Acknowledge: Occurs After Valid Address Byte, After the Subaddress Byte, and After the Data Byte

## read operation:



G[3:0]: Fixed at 1100

A[2:0]: Selectable Via Input Terminals

RW: 1 = Read Shift Register (Note the Slave Address RW Bit = 0)

Subaddress: 11H (0001 0001)

Data: Input Data From the TPIC2810 Device

Acknowledge: Occurs After Valid Address Byte and After the Subaddress Byte



#### Case 2: Transfer serial data to output storage register

This case transfers data from the data shift register to the output storage register. The transfer must occur during the subaddress acknowledge bit and the data byte is ignored.

		SI	ave /	Addr	ess a	and F	R/₩ :	= 0		 		S	ubac	ldres	s 22	Н			l I
S	G G3 G2 G1 G0 A2 A1 A0 RW									/ A S7 S6 S5 S4 S3 S2 S1 S0 A									Р
																			i

G[3:0]: Fixed at 1100

A[2:0]: Selectable Via Input Terminals RW: 0 = Write Shift Register Subaddress: 22H (0010 0010)

Data: Output Data to the TPIC2810 Device

Acknowledge: Occurs After Valid Address Byte and After the Subaddress Byte

#### Case 3: Read serial data and load output storage register

This case loads the data shift register with data via the  $I^2C$  interface and transfers the data to output storage register, if  $R/\overline{W} = 0$ . The transfer occurs during the acknowledge bit following the data byte. Data byte and transfer to the output register is ignored if  $R/\overline{W} = 1$ .

	 	SI	ave /	Addr	ess a	and I	R/W	= 0		Subaddress 44H												Data	to S	Slave				 
s	G3	G2	G1	G0	A2	A1	A0	RW	Α	S7 S6 S5 S4 S3 S2 S1 S0 A									D7	D6	D5	D4	D3	D2	D1	D0	Α	Р

G[3:0]: Fixed at 1100

A[2:0]: Selectable Via Input Terminals RW: 0 = Write Shift Register Subaddress: 44H (0100 0100)

Data: Output Data to the TPIC2810 Device

Acknowledge: Occurs After Valid Address Byte, After the Subaddress Byte and After the Data Byte

#### Case 4: Undefined subaddress values

	Slave Address and $R/\overline{W} = x$					Subaddress Undefined						fined	ı		Don't Care	 					
s	G3	G2	G1	G0	A2	A1	A0	RW	Α	<b>S7</b>	S6	S5	S4	S3	S2	S1	SO	NA		Р	

G[3:0]: Fixed at 1100

A[2:0]: Selectable Via Input Terminals

RW: Don't Care

Subaddress: All Bit Combinations Except 11H, 22H, and 44H

Data: Don't Care; Data Is Ignored

Acknowledge: Occurs After Valid Address Byte, But Is Not Issued After an Undefined Subaddress Byte or After the Data Byte

Following an Undefined Subaddress Byte



## I<sup>2</sup>C bus operation

The I<sup>2</sup>C bus is a communications link between a controller and a series of slave terminals. The link is established using a two-wire bus consisting of a serial clock signal (SCL) and a serial data signal (SDA). The serial clock is sourced from the controller in all cases where the serial data signal is bidirectional for data communication between the controller and the slave terminals. Each device has an open drain output to transmit data on the serial data line. An external pullup resistor must be placed on the serial data signal to provide the high level portion of the data transmission.

Data transmission is initiated with a start bit from the controller as shown in Figure 10. Both the SCL and SDA signals must remain in a logic high state when the controller is not communicating with the slave devices. A start condition is recognized by the slave devices when the SDA line transitions from high to low during the high portion of the SCL signal. Upon reception of a start bit, the TPIC2810 device receives serial data on the SDA input and check for valid address and control information. If the appropriate group and address bits are set for the device, then the device issues an acknowledge pulse and prepares the receive subaddress data. The group ID for the TPIC2810 device is hard coded to be 1100. The slave address bits are set to correspond to the A(0:2) inputs for the device. Up to eight TPIC2810 devices can be placed on the bus. Subaddress data is decoded and responded to as per the *TPIC2810 subaddress and I<sup>2</sup>C protocol definition* section of this data sheet. Data transmission is complete by either the reception of a stop condition or the reception of the data word sent to the device. A stop condition is recognized as a low-to-high transition of the SDA input during the high portion of the SCL signal. All other transitions of the SDA line must occur during the low portion of the SCL signal.

An acknowledge is issued by the TPIC2810 device after the reception of valid address, subaddress and data words as per the *TPIC2810B subaddress and I<sup>2</sup>C protocol definition* section of this document. Reference Figure 10. The device acknowledges each byte of data that it receives from the controller.

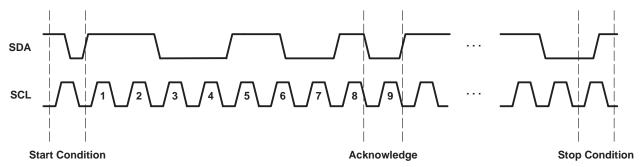


Figure 10. Start/Stop/Acknowledge Protocol



#### PACKAGE OPTION ADDENDUM

www.ti.com 30-Jan-2010

#### **PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
TPIC2810D	ACTIVE	SOIC	D	16	40	TBD	CU NIPDAU	Level-1-220C-UNLIM
TPIC2810DG4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TPIC2810DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
TPIC2810DRG4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

<sup>(1)</sup> 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.

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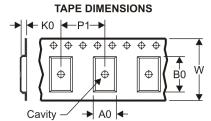
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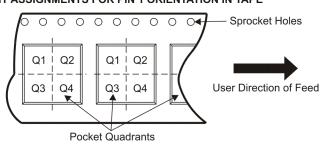
## TAPE AND REEL INFORMATION





	40	Dimension designed to accommodate the component width
		Dimension designed to accommodate the component length
П	K0	Dimension designed to accommodate the component thickness
	W	Overall width of the carrier tape
П	P1	Pitch between successive cavity centers

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



#### \*All dimensions are nominal

Device	Package Type	Package Drawing			Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TPIC2810DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1

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#### \*All dimensions are nominal

ĺ	Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
I	TPIC2810DR	SOIC	D	16	2500	346.0	346.0	33.0

# D (R-PDS0-G16)

## PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
- E. Reference JEDEC MS-012 variation AC.



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