Pin Diagrams

Top View: SO-8

Pin Descriptions

Pin Number	Pin Name	Function
1	V_{CC}	Low-side and logic fixed supply
2	HIN	Logic input for high-side gate driver output (HO), in phase
3	LIN	Logic input for low-side gate driver output (LO), in phase
4	COM	Low-side return
5	LO	Low-side gate drive output
6	V_S	High-side floating supply return
7	HO	High-side gate drive output
8	V_B	High-side floating supply

Functional Block Diagram

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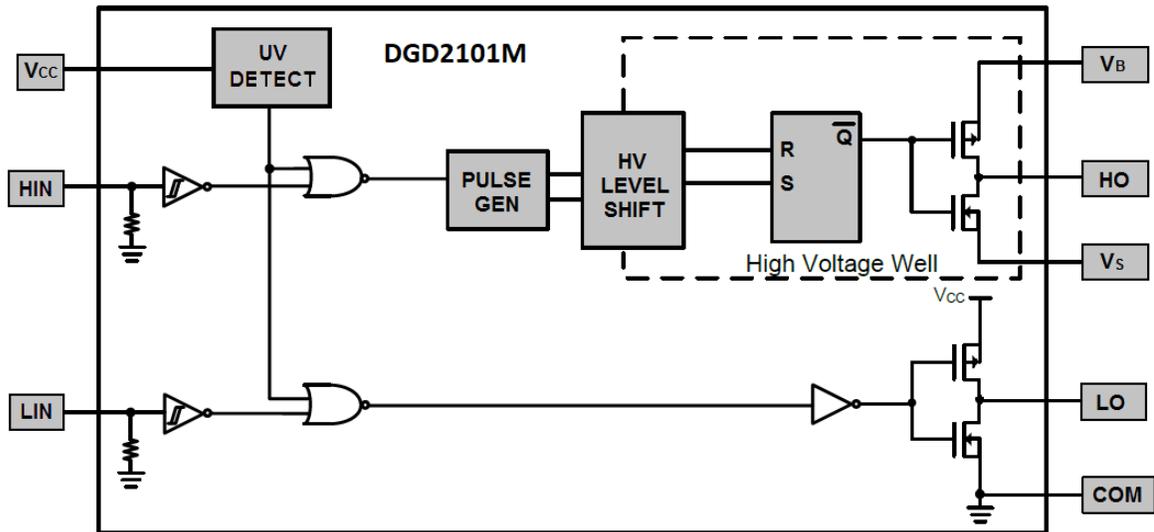
Absolute Maximum Ratings (@T$_A$ = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
High-Side Floating Supply Voltage	V$_B$	-0.3 to +624	V
High-Side Floating Supply Offset Voltage	V$_S$	V$_B$-24 to V$_B$+0.3	V
High-Side Floating Output Voltage	V$_{HO}$	V$_S$-0.3 to V$_B$+0.3	V
Offset Supply Voltage Transient	dV$_S$ / dt	50	V/ns
Low-Side and Logic Fixed Supply Voltage	V$_{CC}$	-0.3 to +24	V
Low-Side Output Voltage	V$_{LO}$	-0.3 to V$_{CC}$+0.3	V
Logic Input Voltage (HIN and LIN)	V$_{IN}$	-0.3 to V$_{CC}$+0.3	V

Thermal Characteristics (@T$_A$ = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor (Note 5)	P$_D$	0.625	W
Thermal Resistance, Junction to Ambient (Note 5)	R$_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Case (Note 5)	R$_{\theta JC}$	45	°C/W
Operating Temperature	T$_J$	+150	°C
Storage Temperature Range	T$_{STG}$	-55 to +150	°C

Note: 5. When mounted on a standard JEDEC 2-layer FR-4 board.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
High-Side Floating Supply Absolute Voltage	V$_B$	V$_S$ + 10	V$_S$ + 20	V
High-Side Floating Supply Offset Voltage	V$_S$	(Note 6)	600	V
High-Side Floating Output Voltage	V$_{HO}$	V$_S$	V$_B$	V
Low-Side and Logic Fixed Supply Voltage	V$_{CC}$	10	20	V
Low-Side Output Voltage	V$_{LO}$	0	V$_{CC}$	V
Logic Input Voltage (HIN and LIN)	V$_{IN}$	0	5	V
Ambient Temperature	T$_A$	-40	+125	°C

Note: 6. Logic operation for V$_S$ = -5V to +600V.

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DC Electrical Characteristics $(V_{BIAS} (V_{CC}, V_{BS}) = 15V, @T_A = +25°C$, unless otherwise specified.) (Note 7)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Logic "1" Input Voltage (Note 8)	V_{IH}	2.5	—	—	V	V_{CC} = 10V to 20V
Logic "0" Input Voltage (Note 8)	V_{IL}	—	—	0.8	V	V_{CC} = 10V to 20V
High Level Output Voltage, $V_{BIAS} - V_O$	V_{OH}	—	0.05	0.2	V	I_O = 2mA
Low Level Output Voltage, V_O	V_{OL}	—	0.02	0.1	V	I_O = 2mA
Offset Supply Leakage Current	I_{LK}	—	—	50	µA	$V_B = V_S$ = 600V
Quiescent V_{BS} Supply Current	I_{BSQ}	—	30	55	µA	V_{IN} = 0V or 5V
Quiescent V_{CC} Supply Current	I_{CCQ}	—	150	270	µA	V_{IN} = 0V or 5V
Logic "1" Input Bias Current	I_{IN+}	—	3.0	10	µA	V_{IN} = 5V
Logic "0" Input Bias Current	I_{IN-}	—	—	5.0	µA	V_{IN} = 0V
V_{CC} Supply Undervoltage Positive Going Threshold	V_{CCUV+}	8.0	8.9	9.8	V	—
V_{CC} Supply Undervoltage Negative Going Threshold	V_{CCUV-}	7.4	8.2	9.0	V	—
Output High Short Circuit Pulsed Current	I_{O+}	130	290	—	mA	V_O = 0V, V_{IN} = Logic"1", PW ≤ 10µs
Output Low Short Circuit Pulsed Current	I_{O-}	270	600	—	mA	V_O = 15V, V_{IN} = Logic"0", PW ≤ 10µs

Notes: 7. The V_{IN} and I_{IN} parameters are referenced to COM. The V_O and I_O parameters are referenced to COM and are applicable to the respective output pins: HO and LO.
8. For optimal operation, it is recommended that the input pulses (HIN and LIN) should have a minimum amplitude of 2.5V with a minimum pulse width of 300ns.

AC Electrical Characteristics $(V_{BIAS} (V_{CC}, V_{BS}) = 15V, C_L = 1000pF, @T_A = +25°C$, unless otherwise specified.)

| Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Turn-On Propagation Delay	t_{ON}	—	160	220	ns	V_S = 0V
Turn-Off Propagation Delay	t_{OFF}	—	150	220	ns	V_S = 600V
Turn-On Rise Time	t_R	—	70	170	ns	—
Turn-Off Fall Time	t_F	—	35	90	ns	—
Delay Matching	t_{DM}	—	—	50	ns	—

Timing Waveforms
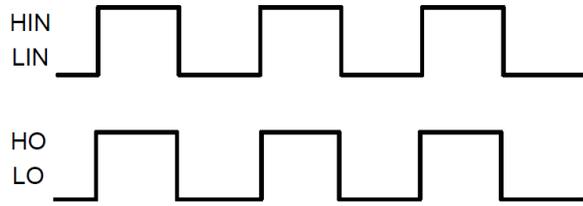
Figure 1. Input / Output Timing Diagram
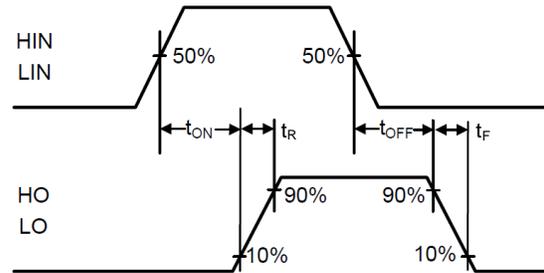
Figure 2. Switching Time Waveform Definitions
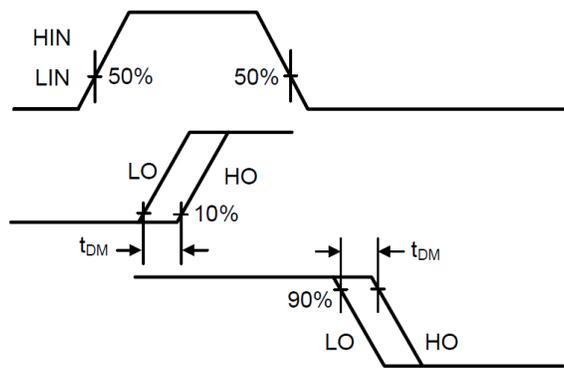
Figure 3. Delay Matching Waveform Definitions

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Typical Performance Characteristics (V$_{CC}$ = 15V, @T$_A$ = +25°C, unless otherwise specified.)
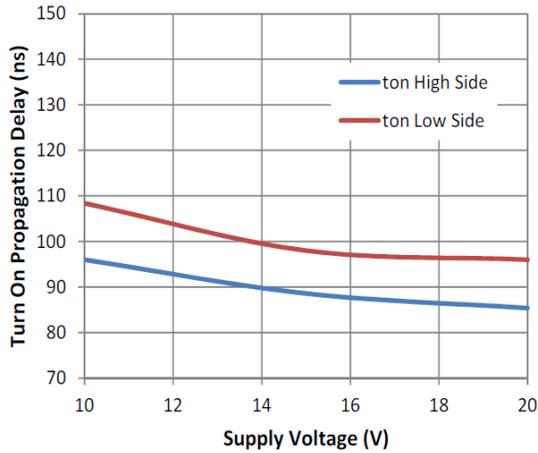

Figure 4. Turn-on Propagation Delay vs. Supply Voltage
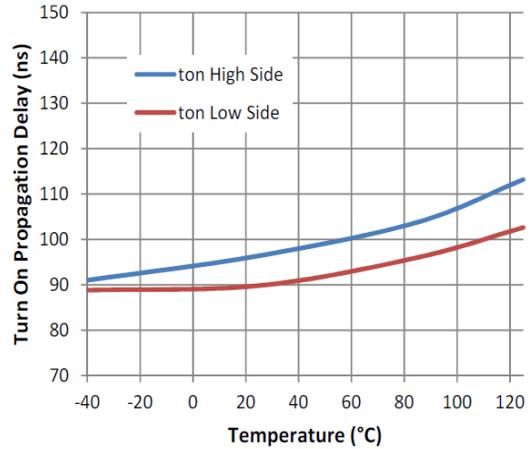
Figure 5. Turn-on Propogation Delay vs. Temperature
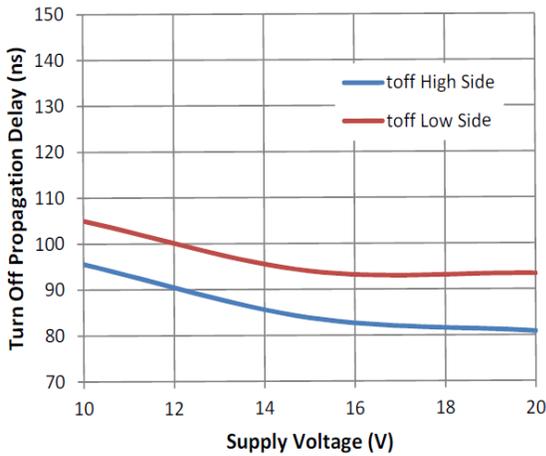
Figure 6. Turn-off Propogation Delay vs. Supply Voltage
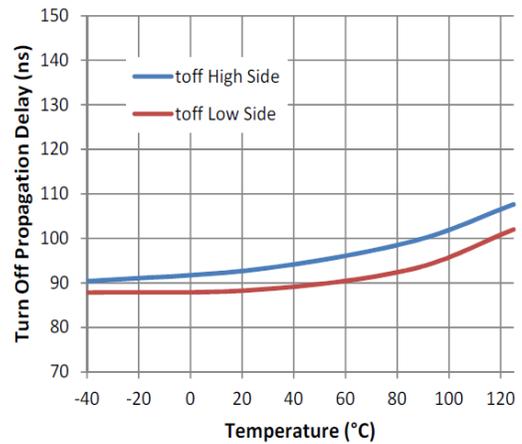
Figure 7. Turn-off Propogation Delay vs. Temperature


Figure 8. Rise Time vs. Supply Voltage
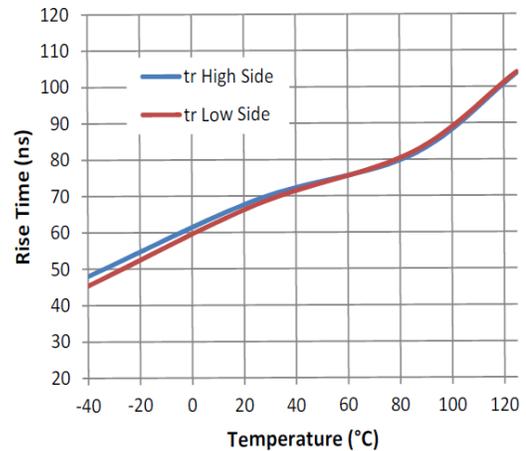
Figure 9. Rise Time vs. Temperature

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Typical Performance Characteristics (continued)
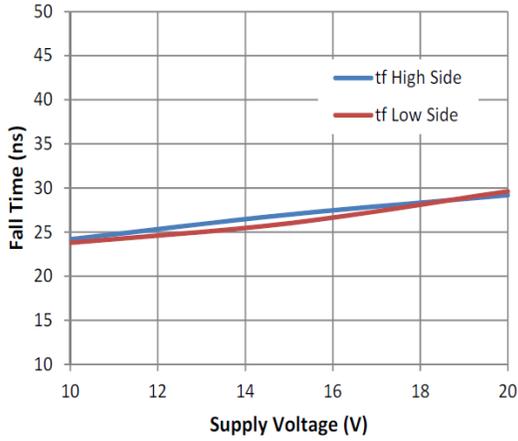
**Figure 10.** Fall Time vs. Supply Voltage
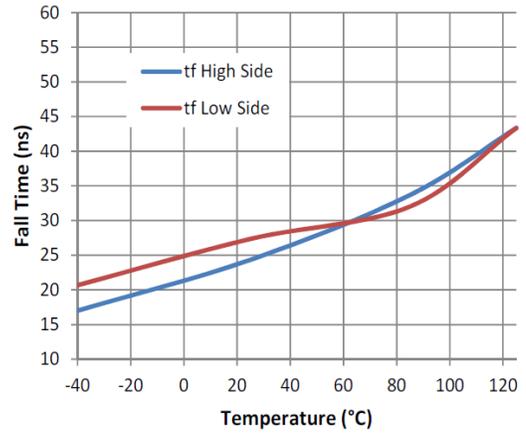
**Figure 11.** Fall Time vs. Temperature
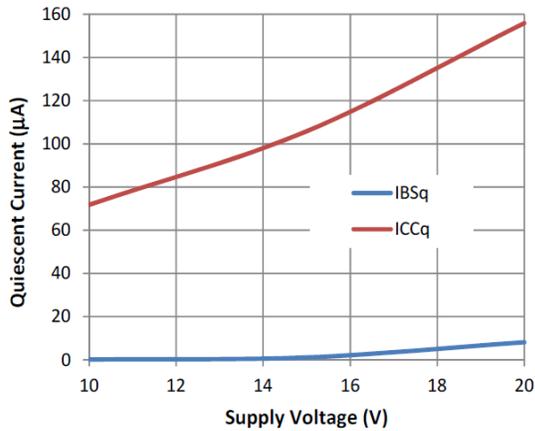
Figure 12. Quiescent Current vs. Supply Voltage
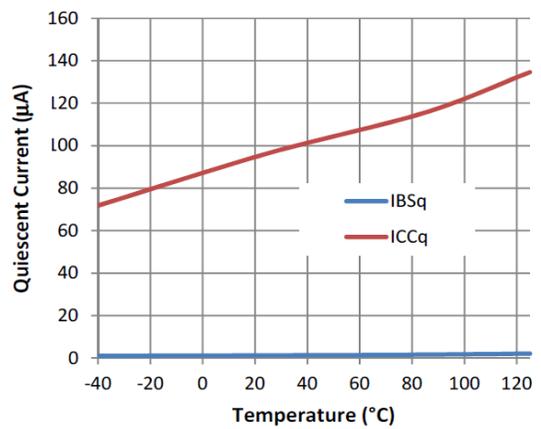
**Figure 13.** Quiescent Current vs. Temperature
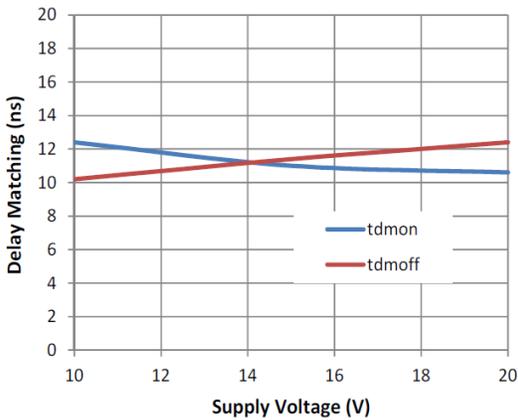

Figure 14. Delay Matching vs. Supply Voltage
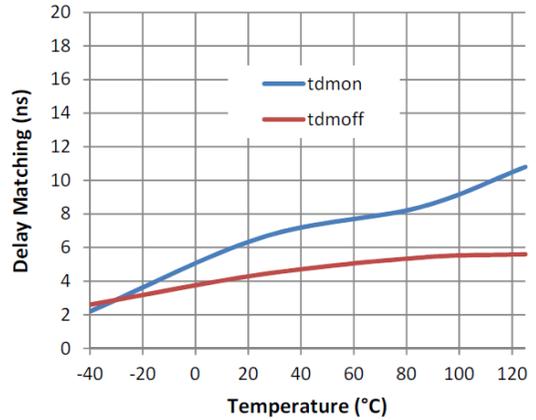
Figure 15. Delay Matching vs. Temperature

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## Typical Performance Characteristics (continued)
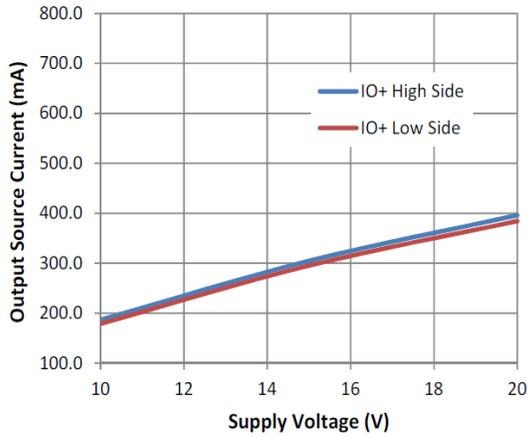
**Figure 16.** Output Source Current vs. Supply Voltage
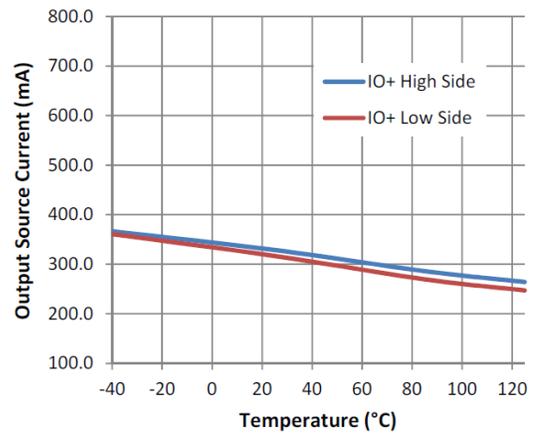


Figure 17. Output Source Current vs. Temperature
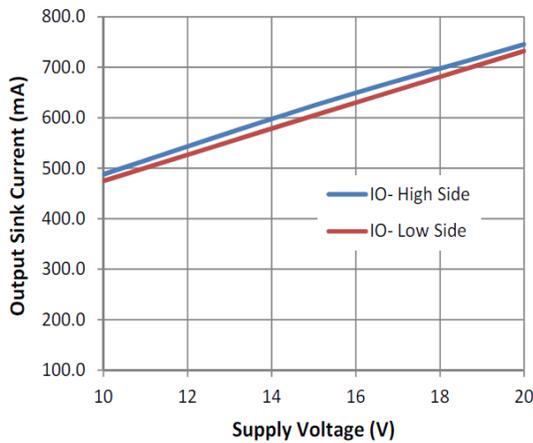
**Figure 18.** Output Sink Current vs. Supply Voltage
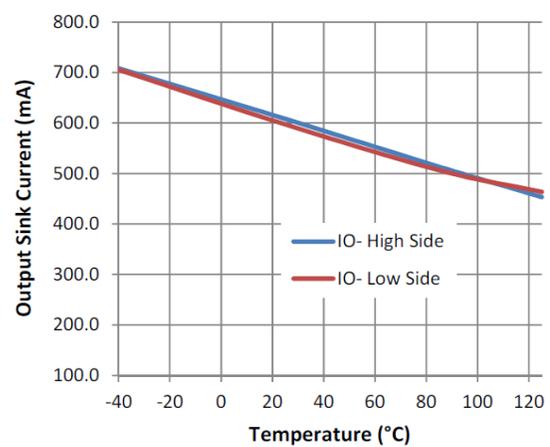
Figure 19. Output Sink Current vs. Temperature
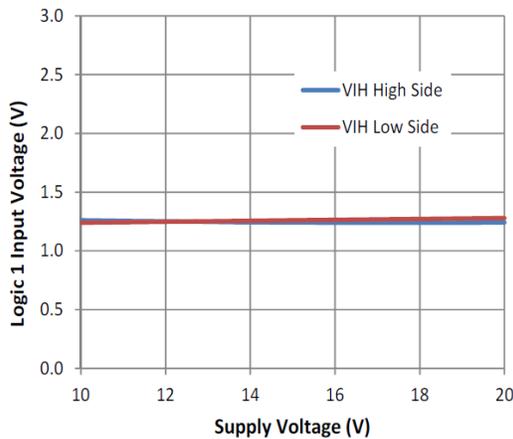

Figure 20. Logic 1 Input Voltage vs. Supply Voltage
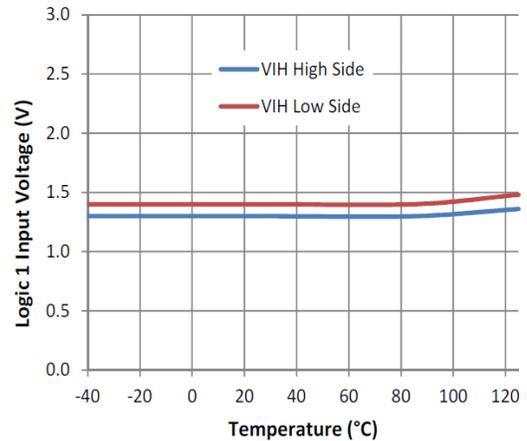
Figure 21. Logic 1 Input Voltage vs. Temperature

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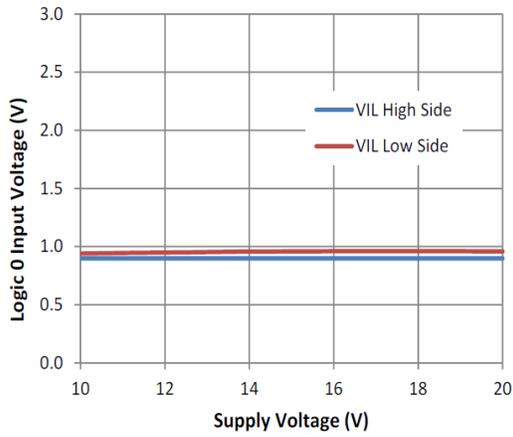
**Figure 22.** Logic 0 Input Voltage vs. Supply Voltage
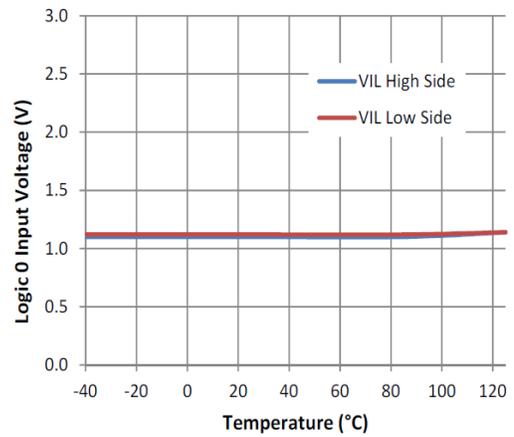
**Figure 23.** Logic 0 Input Voltage vs. Temperature
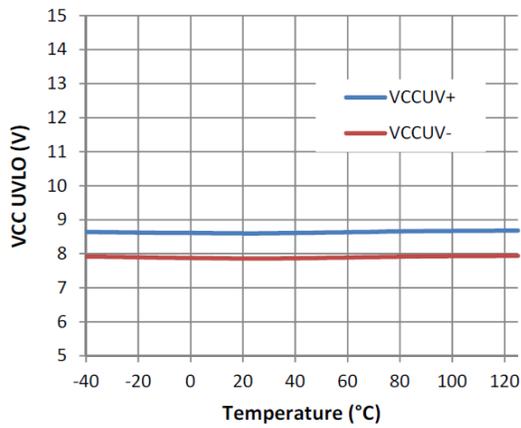


Figure 24. V_{CC} UVLO vs. Temperature
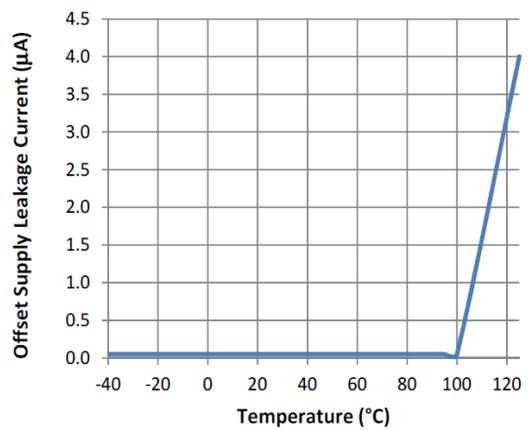
Figure 25. Offset Supply Leakage Current Temperature

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Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.
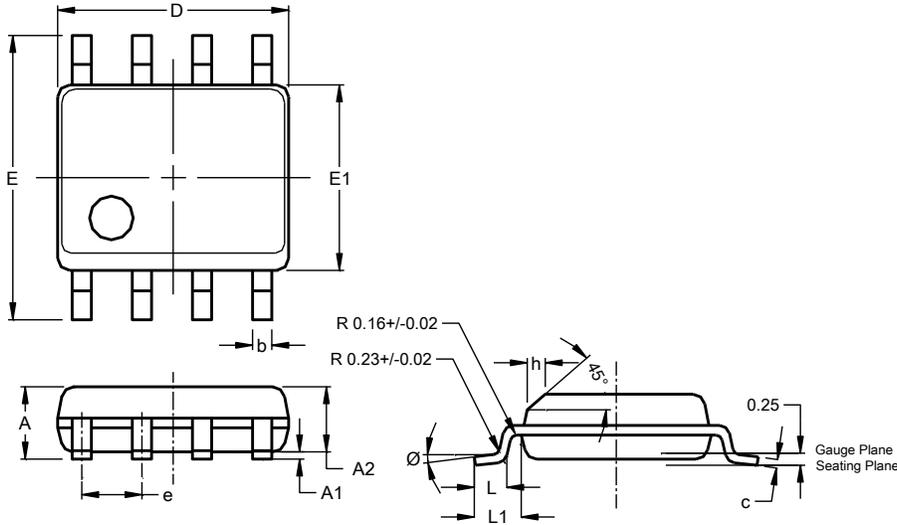
SO-8 (Type TH)

SO-8 (Type TH)			
Dim	**Min**	**Max**	**Typ**
A	1.35	1.75	--
A1	0.10	0.25	--
A2	--	--	1.45
b	0.35	0.51	--
c	0.190	0.248	--
D	4.80	5.00	4.90
E	5.80	6.20	6.00
E1	3.80	4.00	3.90
e	--	--	1.27
h	0.25	0.50	--
L	0.41	1.27	--
L1	--	--	1.04
Ø	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SO-8 (Type TH)
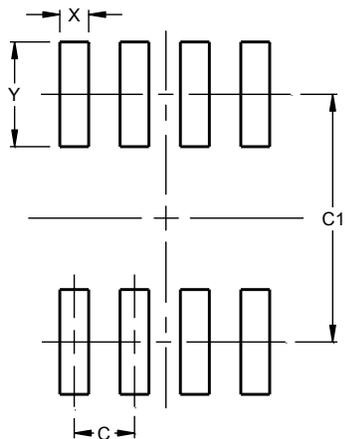
Dimensions	Value (in mm)
C	1.27
C1	5.20
X	0.60
Y	2.20

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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