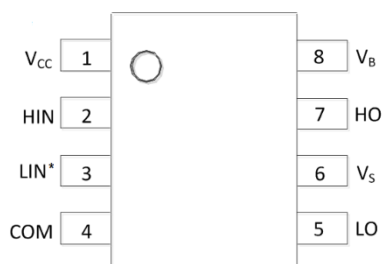


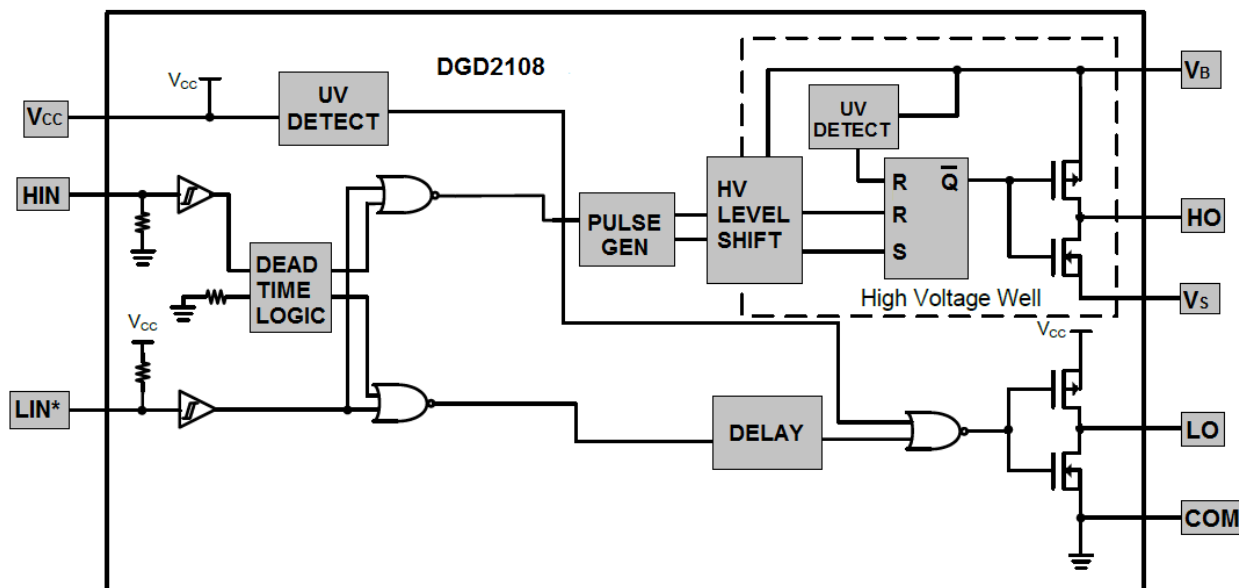
## Pin Diagrams



## Pin Descriptions

Pin Number	Pin Name	Function
1	V <sub>CC</sub>	Low-side and logic fixed supply
2	HIN	Logic input for high-side gate driver output, in phase with HO
3	LIN*	Logic input for low-side gate driver output, out of phase with LO
4	COM	Low-side return
5	LO	Low-side gate drive output
6	V <sub>S</sub>	High-side floating supply return
7	HO	High-side gate drive output
8	V <sub>B</sub>	High-side floating supply

## Functional Block Diagram



**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
High-Side Floating Supply Voltage	V <sub>B</sub>	-0.3 to +624	V
High-Side Floating Supply Offset Voltage	V <sub>S</sub>	V <sub>B</sub> -24 to V <sub>B</sub> +0.3	V
High-Side Floating Output Voltage	V <sub>HO</sub>	V <sub>S</sub> -0.3 to V <sub>B</sub> +0.3	V
Offset Supply Voltage Transient	dV <sub>S</sub> / dt	50	V/ns
Low-Side and Logic Fixed Supply Voltage	V <sub>CC</sub>	-0.3 to +24	V
Low-Side Output Voltage	V <sub>LO</sub>	-0.3 to V <sub>CC</sub> +0.3	V
Logic Input Voltage (HIN and LIN*)	V <sub>IN</sub>	-0.3 to V <sub>CC</sub> +0.3	V

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor (Note 5)	P <sub>D</sub>	0.625	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	200	°C/W
Operating Temperature	T <sub>J</sub>	+150	°C
Lead Temperature (Soldering, 10s)	T <sub>L</sub>	+300	
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	

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 <sub>B</sub>	V <sub>S</sub> + 10	V <sub>S</sub> + 20	V
High-Side Floating Supply Offset Voltage	V <sub>S</sub>	(Note 6)	600	V
High-Side Floating Output Voltage	V <sub>HO</sub>	V <sub>S</sub>	V <sub>B</sub>	V
Low-Side and Logic Fixed Supply Voltage	V <sub>CC</sub>	10	20	V
Low-Side Output Voltage	V <sub>LO</sub>	0	V <sub>CC</sub>	V
Logic Input Voltage	V <sub>IN</sub>	0	5	V
Ambient Temperature	T <sub>A</sub>	-40	+125	°C

Note: 6. Logic operation for V<sub>S</sub> of -5V to +600V.

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

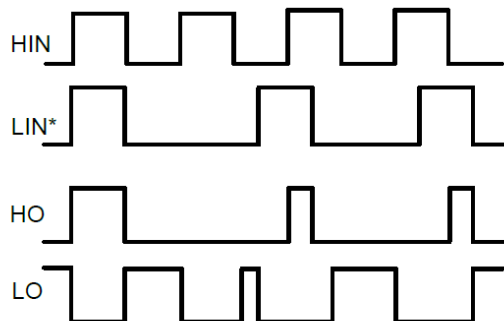
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Logic "1" Input Voltage (Note 8)	$V_{IH}$	2.5	—	—	V	$V_{CC} = 10V$ to 20V
Logic "0" Input Voltage (Note 8)	$V_{IL}$	—	—	0.6	V	$V_{CC} = 10V$ to 20V
High Level Output Voltage, $V_{BIAS} - V_O$	$V_{OH}$	—	0.05	0.2	V	$I_O = 2mA$
Low Level Output Voltage, $V_O$	$V_{OL}$	—	0.2	0.1	V	$I_O = 2mA$
Offset Supply Leakage Current	$I_{LK}$	—	—	50	$\mu A$	$V_B = V_S = 600V$
Quiescent $V_{BS}$ Supply Current	$I_{BSQ}$	20	75	130	$\mu A$	$V_{IN} = 0V$ or 5V
Quiescent $V_{CC}$ Supply Current	$I_{CCQ}$	0.4	1.0	1.6	mA	$V_{IN} = 0V$ or 5V
Logic "1" Input Bias Current	$I_{IN+}$	—	5	20	$\mu A$	$HIN = 5V$ , $LIN^* = 0V$
Logic "0" Input Bias Current	$I_{IN-}$	—	—	5	$\mu A$	$HIN = 0V$ , $LIN^* = 5V$
$V_{BS}$ Supply Undervoltage Positive Going Threshold	$V_{BSUV+}$	8.0	8.9	9.8	V	—
$V_{BS}$ Supply Undervoltage Negative Going Threshold	$V_{BSUV-}$	7.4	8.2	9.0	V	—
$V_{CC}$ 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	—
Hysteresis	$V_{CCUVH}$	0.3	0.7	—	V	—
	$V_{BSUVH}$					—
Output High Short Circuit Pulsed Current	$I_{O+}$	120	290	—	mA	$V_O = 0V$ , $PW \leq 10\mu s$
Output Low Short Circuit Pulsed Current	$I_{O-}$	250	600	—	mA	$V_O = 15V$ , $PW \leq 10\mu s$

- Notes:
7. The  $V_{IN}$  and  $I_{IN}$  parameters are referenced to  $V_{SS}$  and are applicable to the two logic input pins:  $HIN$  and  $LIN^*$ . 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 1 $\mu s$ .

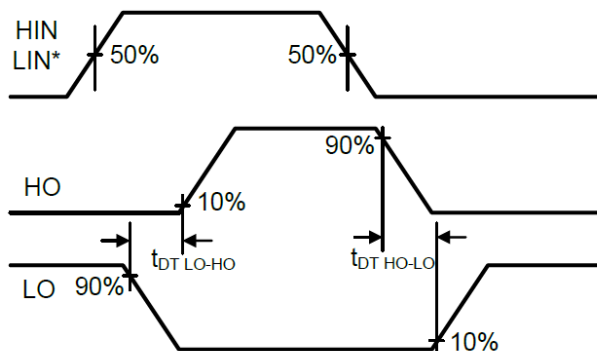
**AC Electrical Characteristics** ( $V_{BIAS}$  ( $V_{CC}$ ,  $V_{BS}$ ) = 15V,  $C_L = 1000pF$ , @ $T_A$  = +25°C, unless otherwise specified.)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Turn-On Propagation Delay	$t_{ON}$	—	220	300	ns	$V_S = 0V$
Turn-Off Propagation Delay	$t_{OFF}$	—	200	280	ns	$V_S = 0V$ or 600V
Delay Matching, $ t_{ON} - t_{OFF} $	$t_{DMON}$	—	—	30	ns	—
Turn-On Rise Time	$t_r$	—	100	220	ns	$V_S = 0V$
Turn-Off Fall Time	$t_f$	—	35	80	ns	$V_S = 0V$
Deadtime: $t_{DT LO-HO}$ & $t_{DT HO-LO}$	$t_{DT}$	400	540	680	ns	—
Deadtime Matching: $t_{DT LO-HO} - t_{DT HO-LO}$	$t_{MDT}$	—	0	60	ns	—

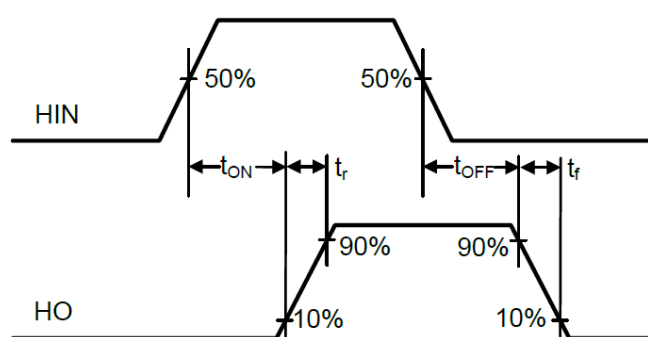
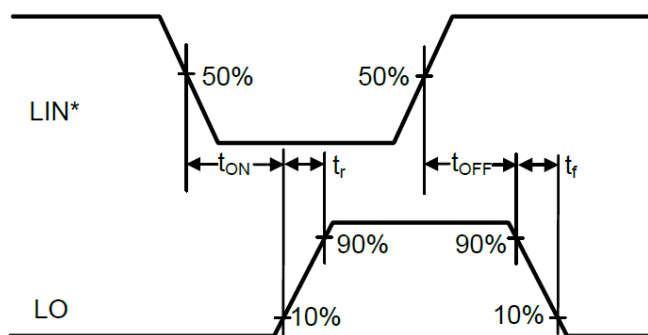
## Timing Waveforms



**Figure 1.** Input / Output Timing Diagram

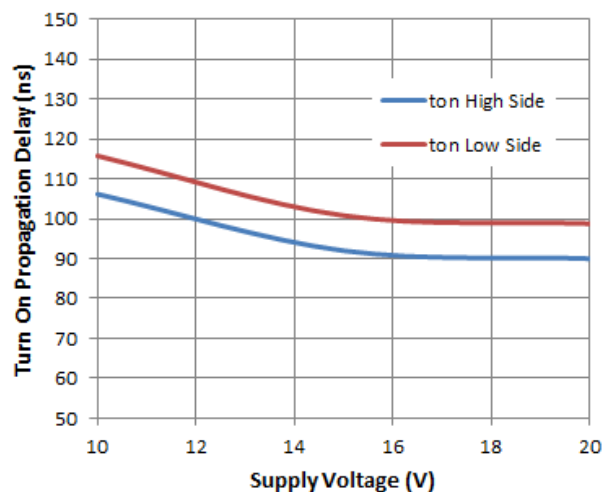


**Figure 2.** Deadtime Waveform Definitions

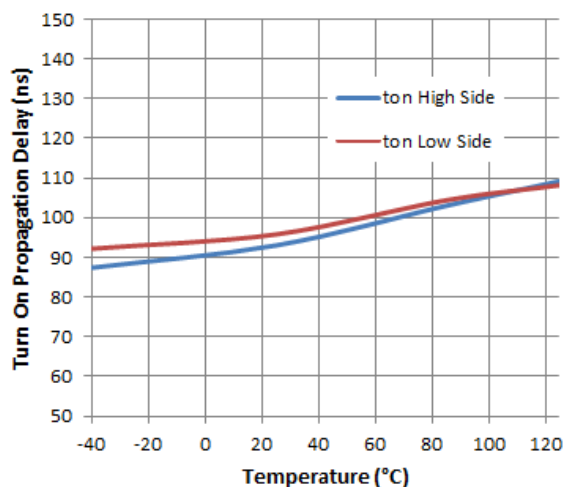


**Figure 3.** Switching Time Waveform Definitions

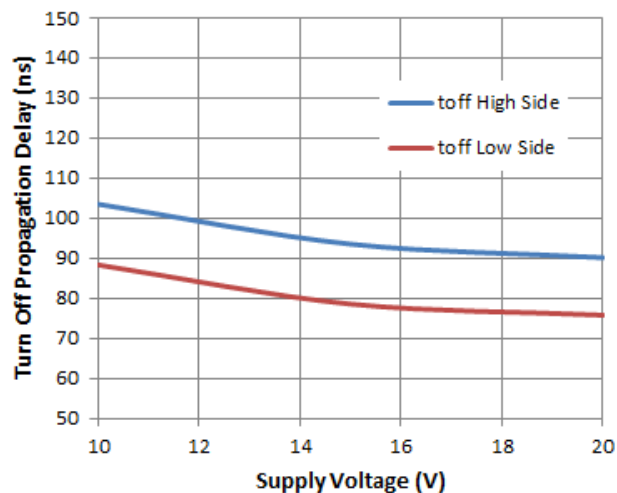
**Typical Performance Characteristics** ( $V_{CC} = 15V$ ,  $@T_A = +25^\circ C$ , unless otherwise specified.)



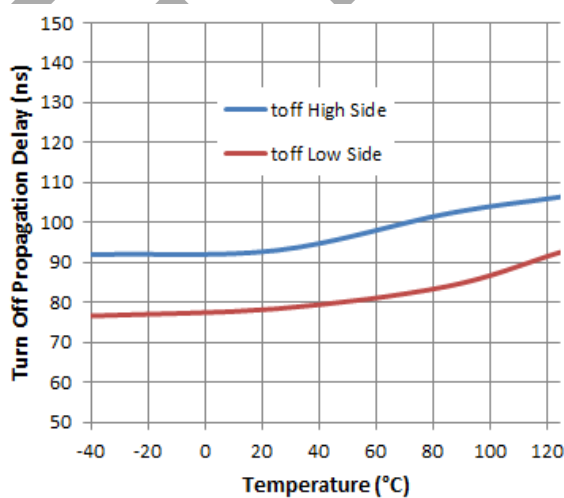
**Figure 4.** Turn-on Propagation Delay vs. Supply Voltage



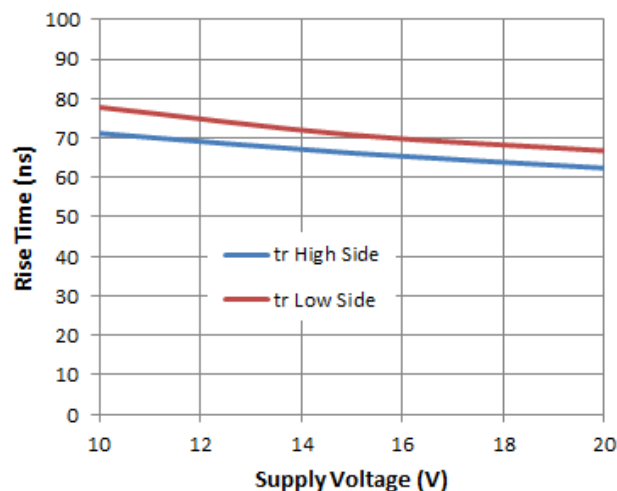
**Figure 5.** Turn-on Propagation Delay vs. Temperature



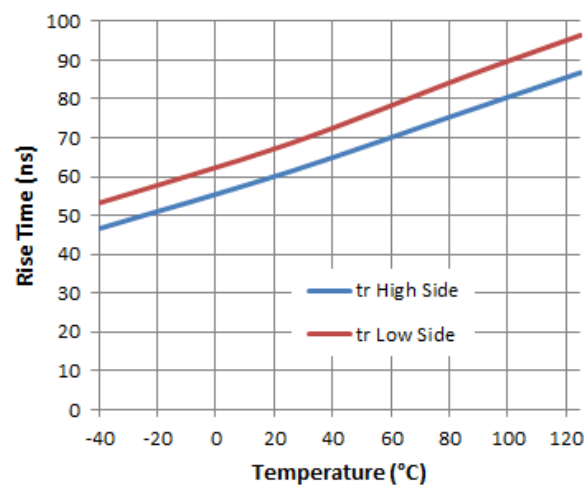
**Figure 6.** Turn-off Propagation Delay vs. Supply Voltage



**Figure 7.** Turn-off Propagation Delay vs. Temperature



**Figure 8.** Rise Time vs. Supply Voltage



**Figure 9.** Rise Time vs. Temperature

Typical Performance Characteristics (continued)

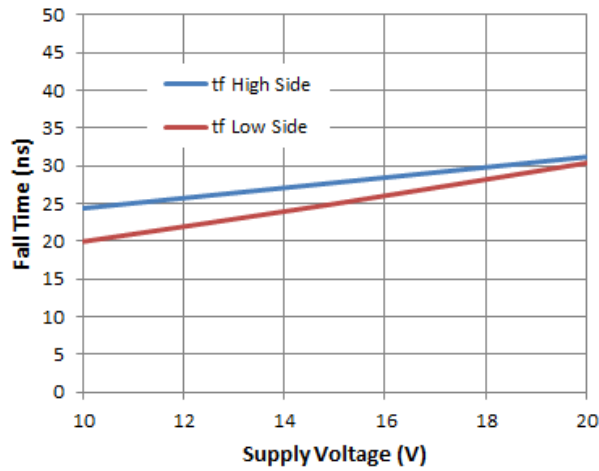


Figure 10. Fall Time vs. Supply Voltage

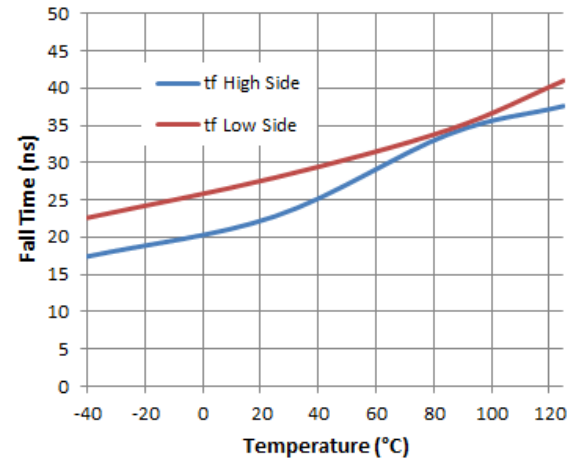


Figure 11. Fall Time vs. Temperature

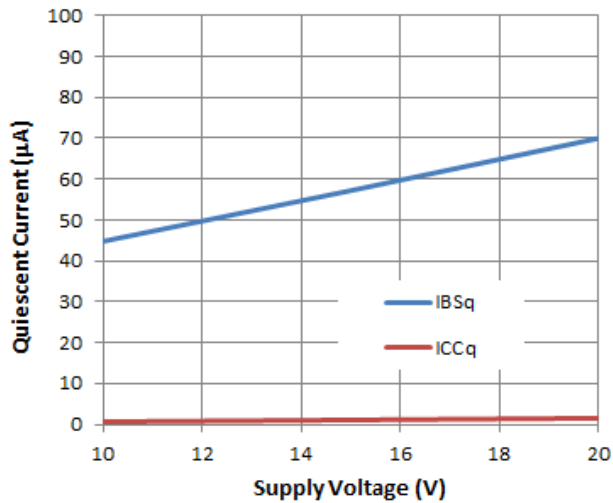


Figure 12. Quiescent Current vs. Supply Voltage

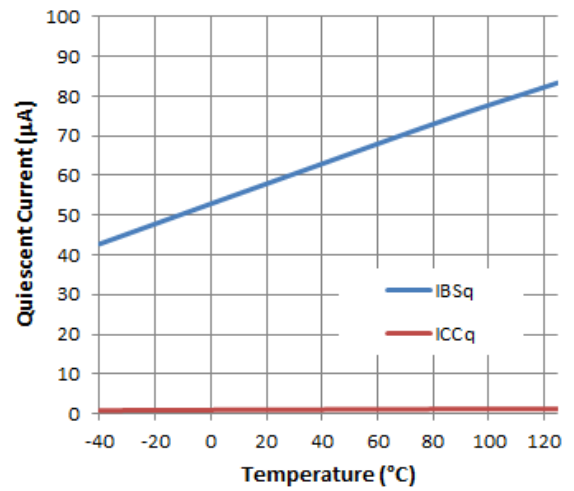


Figure 13. Quiescent Current vs. Temperature

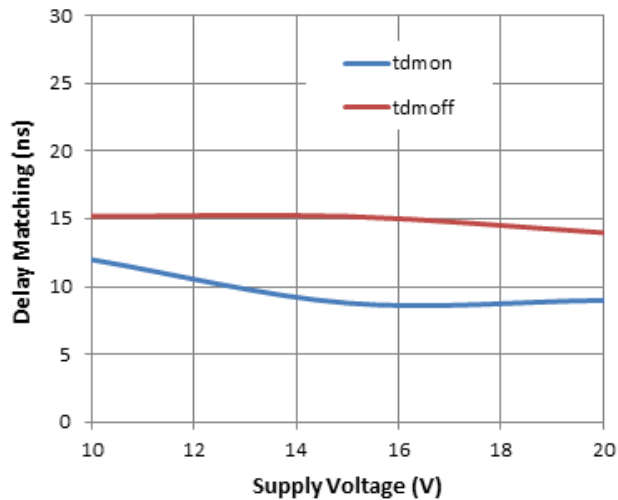


Figure 14. Delay Matching vs. Supply Voltage

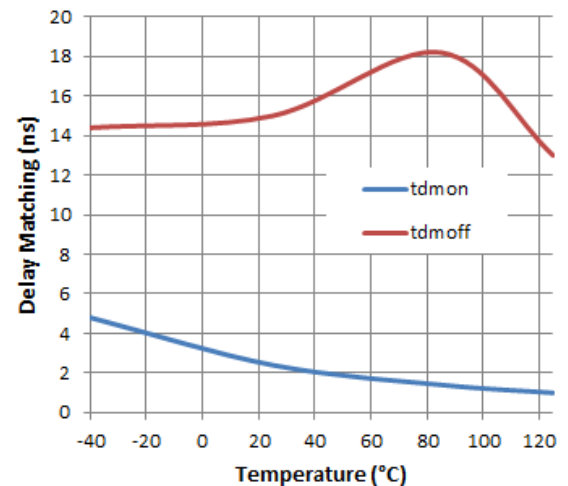


Figure 15. Delay Matching vs. Temperature

# Typical Performance Characteristics (continued)

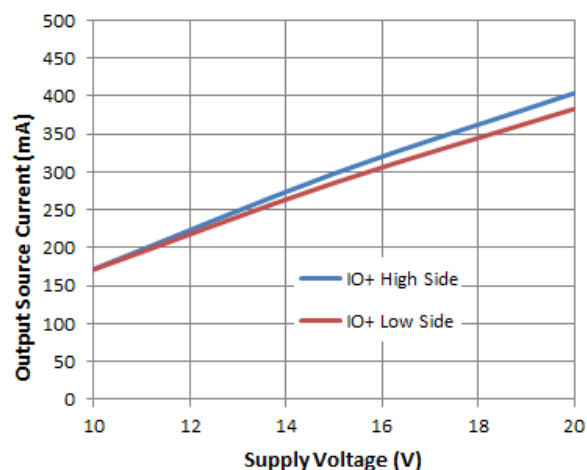


Figure 16. Output Source Current vs. Supply Voltage

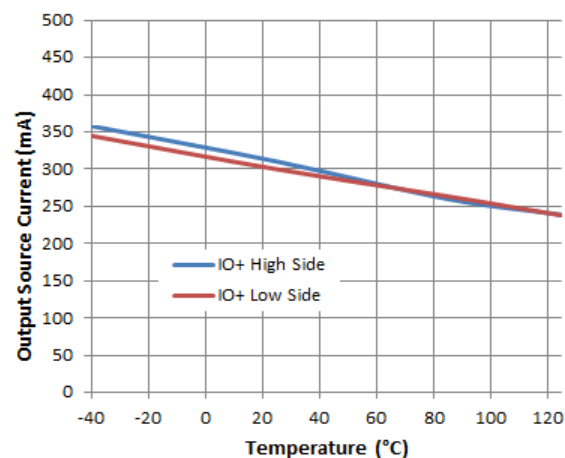


Figure 17. Output Source Current vs. Temperature

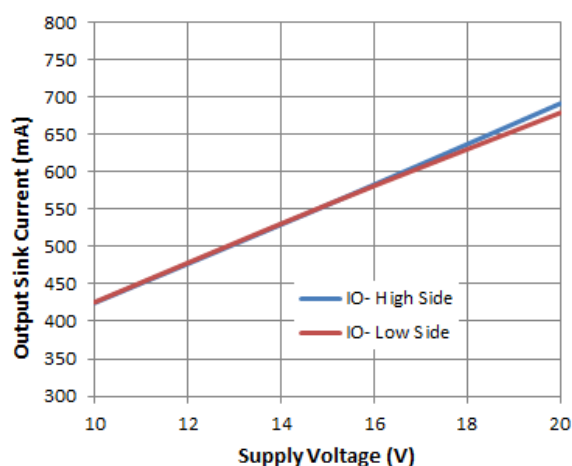


Figure 18. Output Sink Current vs. Supply Voltage

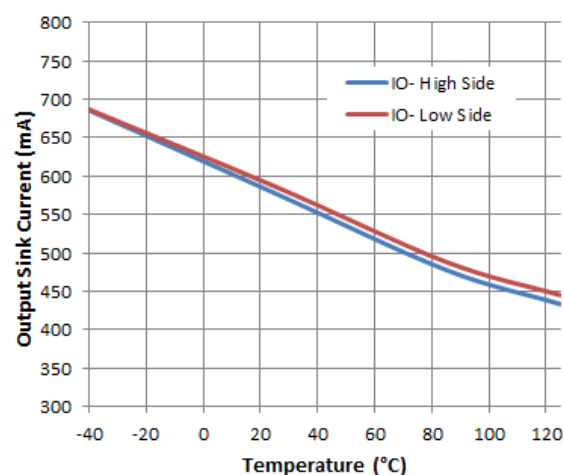


Figure 19. Output Sink Current vs. Temperature

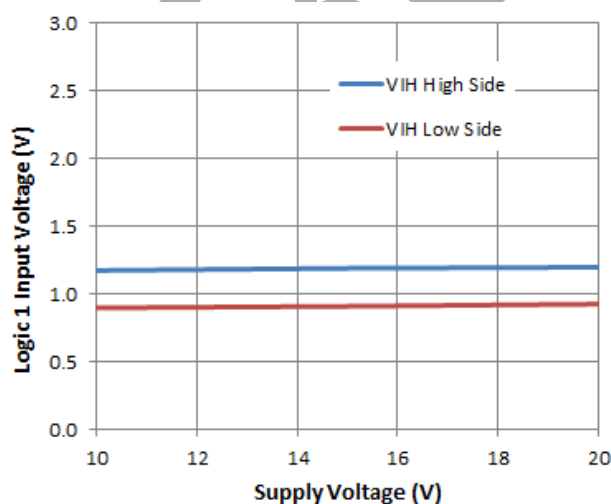


Figure 20. Logic 1 Input Voltage vs. Supply Voltage

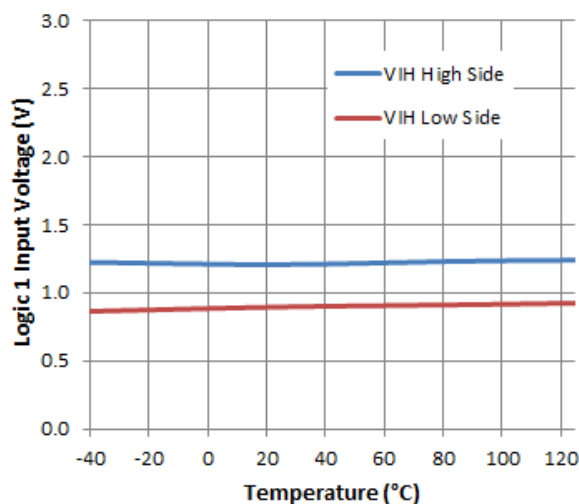


Figure 21. Logic 1 Input Voltage vs. Temperature

# Typical Performance Characteristics (continued)

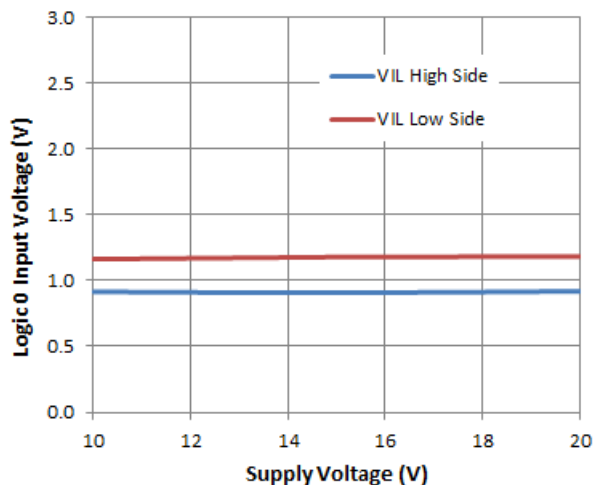


Figure 22. Logic 0 Input Voltage vs. Supply Voltage

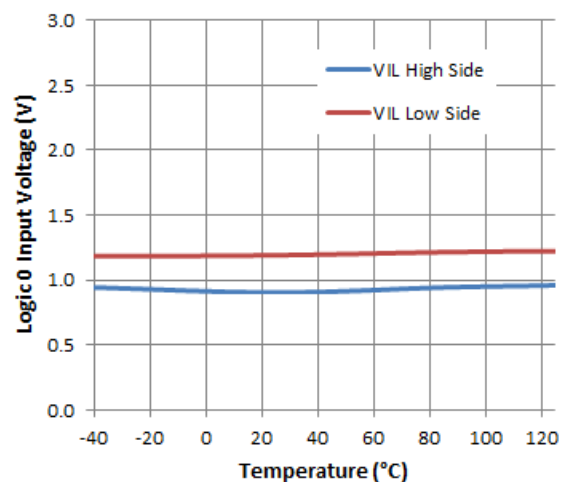


Figure 23. Logic 0 Input Voltage vs. Temperature

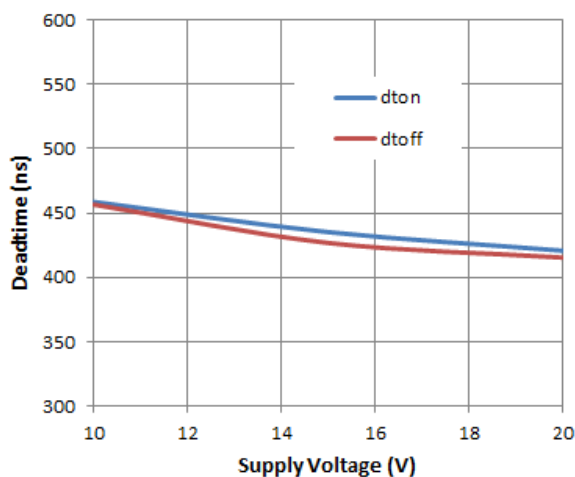


Figure 24. Deadtime vs. Supply Voltage

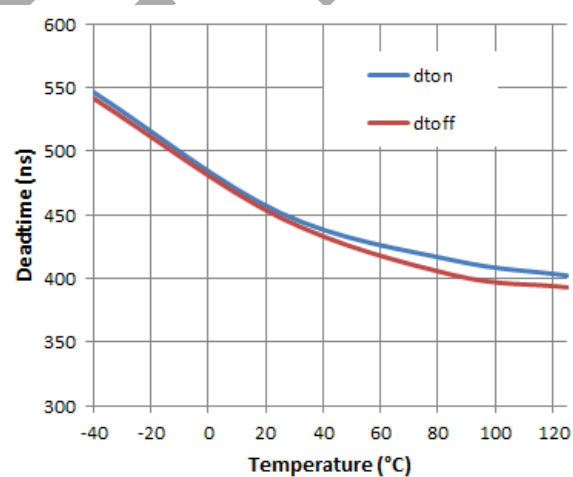


Figure 25. Deadtime vs. Temperature

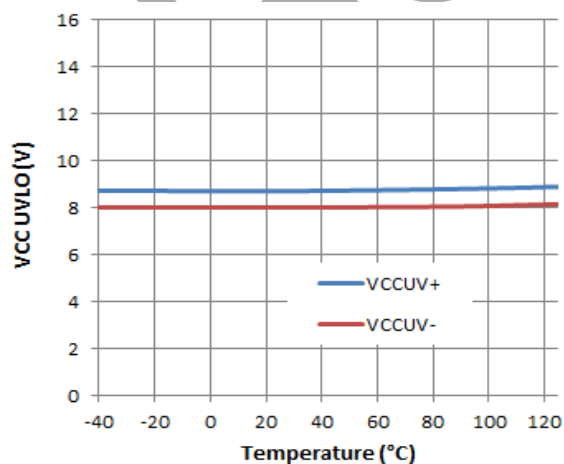


Figure 26. VCC UVLO vs. Temperature

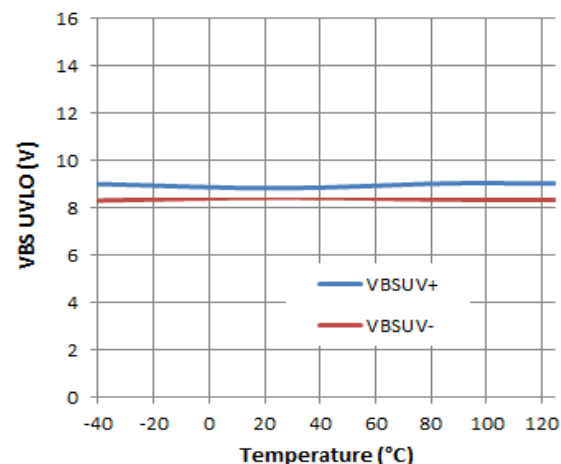
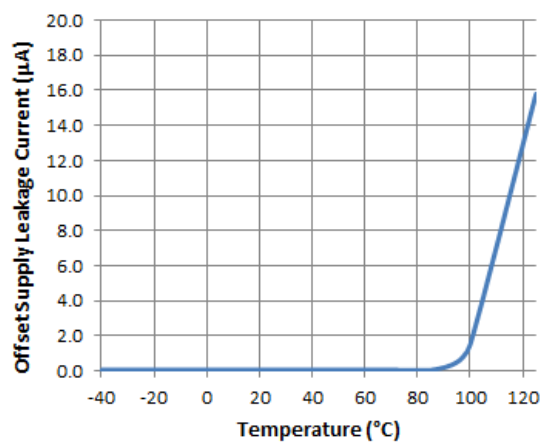


Figure 27. VBS UVLO vs. Temperature



## Typical Performance Characteristics (continued)



**Figure 28.** Offset Supply Leakage Current vs. Temperature

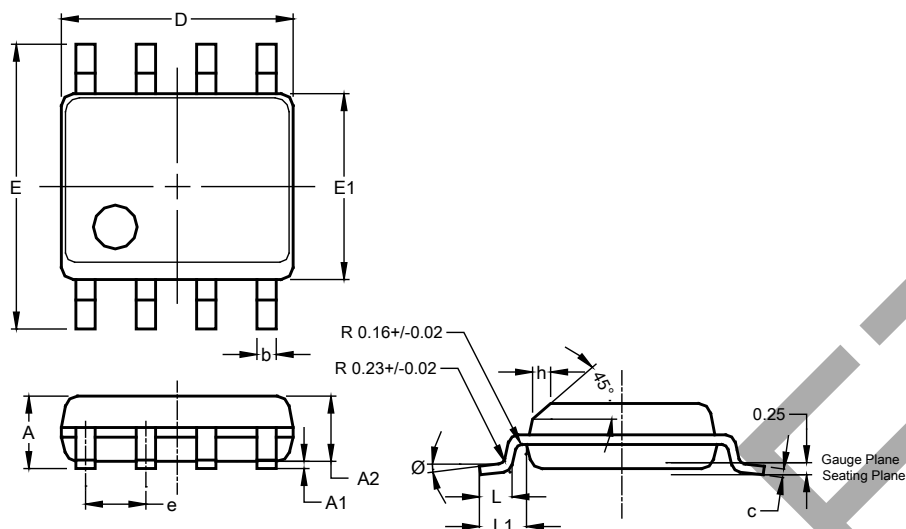
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## Package Outline Dimensions

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

### SO-8 (Type TH)

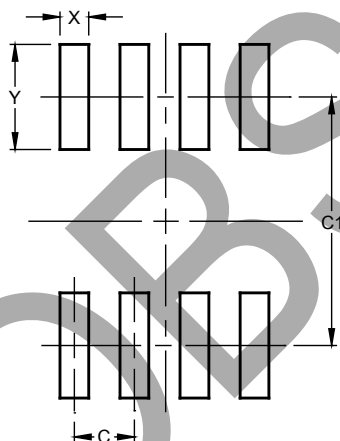


SO-8 (Type TH)			
Dim	Min	Max	Typ
A	1.35	1.75	--
A1	0.10	0.25	--
A2	--	--	1.45
b	0.35	0.51	--
c	0.190	0.248	--
D	4.80	5.00	4.90
E	5.80	6.20	6.00
E1	3.80	4.00	3.90
e	--	--	1.27
h	0.25	0.50	--
L	0.41	1.27	--
L1	--	--	1.04
Ø	0°	8°	--
All Dimensions in mm			

## 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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