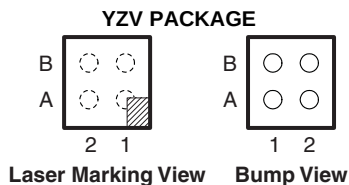


ULTRA-SMALL, LOW-INPUT VOLTAGE, LOW r_{ON} LOAD SWITCH

FEATURES

- Low Input Voltage: 1.0 V to 3.6 V
- Ultra-Low ON-State Resistance
 - $r_{ON} = 90\text{ m}\Omega$ at $V_{IN} = 3.6\text{ V}$
 - $r_{ON} = 100\text{ m}\Omega$ at $V_{IN} = 2.5\text{ V}$
 - $r_{ON} = 114\text{ m}\Omega$ at $V_{IN} = 1.8\text{ V}$
 - $r_{ON} = 172\text{ m}\Omega$ at $V_{IN} = 1.2\text{ V}$
- 500-mA Maximum Continuous Switch Current
- Ultra Low Quiescent Current: 82 nA at 1.8 V
- Ultra Low Shutdown Current: 44 nA at 1.8 V
- Low Control Input Thresholds Enable Use of 1.2-V/1.8-V/2.5-V/3.3-V Logic
- Controlled Slew Rate to Avoid Inrush Current: 220 μs t_r
- ESD Performance Tested Per JESD 22
 - 2000-V Human-Body Model (A114-B, Class II)
 - 1000-V Charged-Device Model (C101)
- Four-Terminal Wafer-Chip-Scale Package (WCSP)
 - 0.9 mm $\times$ 0.9 mm, 0.5-mm Pitch, 0.5-mm Height



APPLICATIONS

- Personal Digital Assistants (PDAs)
- Cellular Phones
- GPS Devices
- MP3 Players
- Digital Cameras
- Peripheral Ports
- Portable Instrumentation
- RF Modules

DESCRIPTION

TPS22906 is an ultra-small, low ON-state resistance (r_{ON}) load switch with controlled turn on. The device contains a P-channel MOSFET that operates over an input voltage range of 1.0 V to 3.6 V. The switch is controlled by an on/off input (ON), which is capable of interfacing directly with low-voltage control signals. A 120- Ω on-chip load resistor is added for output quick discharge when the switch is turned off.

TPS22906 is available in a space-saving 4-terminal WCSP with 0.5-mm pitch (YZV). The device is characterized for operation over the free-air temperature range of -40°C to 85°C .

TERMINAL ASSIGNMENTS

B	ON	GND
A	V_{IN}	V_{OUT}
	2	1

DEVICE	r_{ON} at 1.8 V (TYP)	SLEW RATE (TYP at 1.8 V)	QUICK OUTPUT DISCHARGE ⁽¹⁾	MAX OUTPUT CURRENT	ENABLE
TPS22906	114 m Ω	220 μs	Yes	500 mA	Active high

- (1) This feature discharges the output of the switch to ground through a 120- Ω resistor, preventing the output from floating.

ORDERING INFORMATION

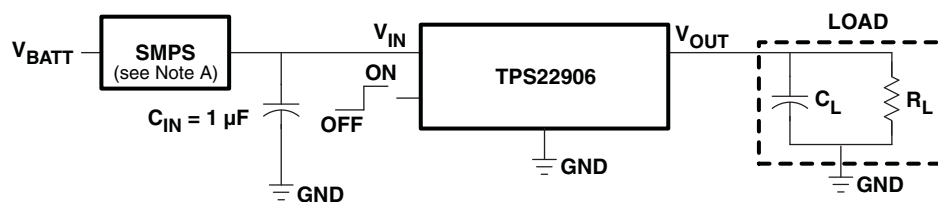
T_A	PACKAGE ⁽¹⁾⁽²⁾		ORDERABLE PART NUMBER	TOP-SIDE MARKING
-40°C to 85°C	WCSP – YZV (0.5-mm pitch)	Tape and reel	TPS22906YZVR	__ _ 5D_ ⁽³⁾

- (1) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.
 (2) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.
 (3) The actual top-side marking has three preceding characters to denote year, month, and sequence code, and one following character to designate the wafer fab/assembly site. Pin 1 identifier indicates solder-bump composition (1 = SnPb, • = Pb-free).



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.

TYPICAL APPLICATION



A. Switched mode power supply

APPLICATION BLOCK DIAGRAM

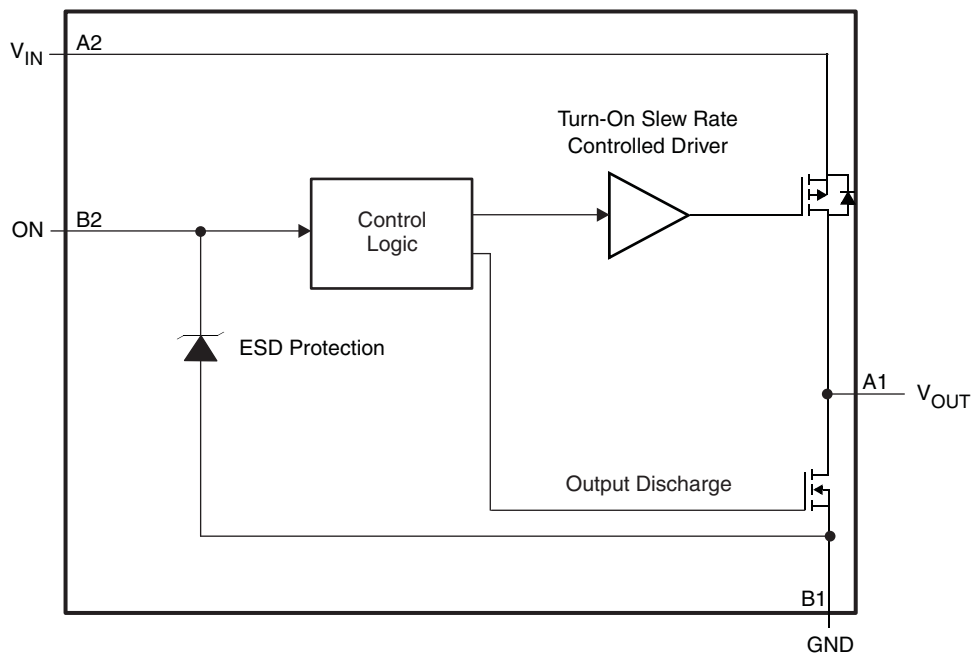


Figure 1. Functional Block Diagram

FUNCTION TABLE

ON (Control Input)	V_{IN} to V_{OUT}	V_{OUT} to GND
L	OFF	ON
H	ON	OFF

TERMINAL FUNCTIONS

TERMINAL		DESCRIPTION
BALL NO.	NAME	
A1	V _{OUT}	Switch output
A2	V _{IN}	Switch input, bypass this input with a ceramic capacitor to ground
B1	GND	Ground
B2	ON	Switch control input, active high

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

		MIN	MAX	UNIT
V _{IN}	Input voltage range	−0.3	4	V
V _{OUT}	Output voltage range		V _{IN} + 0.3	V
V _{ON}	Input voltage range	−0.3	4	V
P _D	Power dissipation at T _A = 25°C		0.48	W
I _{MAX}	Maximum continuous switch current		500	mA
T _A	Operating free-air temperature range	−40	85	°C
T _{stg}	Storage temperature range	−65	150	°C
T _{lead}	Maximum lead temperature (10-s soldering time)		300	°C
ESD	Electrostatic discharge protection	Human-Body Model (HBM)		2000
		Charged-Device Model (CDM)		1000
				V

- (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.

THERMAL IMPEDANCE RATING

			UNIT
θ _{JA}	Package thermal impedance ⁽¹⁾	YZV package	123 °C/W

- (1) The package thermal impedance is calculated in accordance with JESD 51-7.

RECOMMENDED OPERATING CONDITIONS

		MIN	MAX	UNIT
V _{IN}	Input voltage range	1	3.6	V
V _{OUT}	Output voltage range		V _{IN}	V
V _{IH}	High-level input voltage, ON	0.85	3.6	V
V _{IL}	Low-level input voltage, ON		0.4	V
C _{IN}	Input capacitor	1 ⁽¹⁾		μF

- (1) See [Application Information](#).

ELECTRICAL CHARACTERISTICS

$V_{IN} = 1.0\text{ V}$ to 3.6 V , $T_A = -40^\circ\text{C}$ to 85°C (unless otherwise noted)

PARAMETER		TEST CONDITIONS		T_A	MIN	TYP ⁽¹⁾	MAX	UNIT
I_{IN}	Quiescent current	$I_{OUT} = 0$, $V_{IN} = V_{ON}$	$V_{IN} = 1.1\text{ V}$	Full		37	120	nA
			$V_{IN} = 1.8\text{ V}$	Full		82	235	
			$V_{IN} = 3.6\text{ V}$	Full		204	880	
$I_{IN(OFF)}$	OFF-state supply current	$V_{ON} = \text{GND}$, $\text{OUT} = \text{Open}$	$V_{IN} = 1.1\text{ V}$	Full		22	210	nA
			$V_{IN} = 1.8\text{ V}$	Full		44	260	
			$V_{IN} = 3.6\text{ V}$	Full		137	700	
$I_{IN(LEAKAGE)}$	OFF-state switch current	$V_{ON} = \text{GND}$, $V_{OUT} = 0$	$V_{IN} = 1.1\text{ V}$	Full		22	140	nA
			$V_{IN} = 1.8\text{ V}$	Full		45	230	
			$V_{IN} = 3.6\text{ V}$	Full		137	610	
r_{ON}	ON-state resistance	$I_{OUT} = -200\text{ mA}$	$V_{IN} = 3.6\text{ V}$	25°C		90	108	m Ω
				Full			125	
			$V_{IN} = 2.5\text{ V}$	25°C		100	120	
				Full			140	
			$V_{IN} = 1.8\text{ V}$	25°C		114	138	
				Full			160	
			$V_{IN} = 1.2\text{ V}$	25°C		172	210	
				Full			235	
r_{PD}	Output pulldown resistance	$V_{IN} = 3.3\text{ V}$, $V_{ON} = 0$, $I_{OUT} = 30\text{ mA}$	25°C			88	120	Ω
I_{ON}	ON input leakage current	$V_{ON} = 1.1\text{ V}$ to 3.6 V or GND	Full				25	nA

(1) Typical values are at the specified V_{IN} and $T_A = 25^\circ\text{C}$.

SWITCHING CHARACTERISTICS

$V_{IN} = 1.1\text{ V}$, $T_A = 25^\circ\text{C}$, $R_{L_CHIP} = 120\text{ }\Omega$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{ON}	Turn-ON time	$R_L = 500\text{ }\Omega$	$C_L = 0.1\text{ }\mu\text{F}$		531		μs
			$C_L = 1\text{ }\mu\text{F}$		596		
			$C_L = 3.3\text{ }\mu\text{F}$		659		
t_{OFF}	Turn-OFF time	$R_L = 500\text{ }\Omega$	$C_L = 0.1\text{ }\mu\text{F}$		11		μs
			$C_L = 1\text{ }\mu\text{F}$		67		
			$C_L = 3.3\text{ }\mu\text{F}$		225		
t_r	V_{OUT} rise time	$R_L = 500\text{ }\Omega$	$C_L = 0.1\text{ }\mu\text{F}$		365		μs
			$C_L = 1\text{ }\mu\text{F}$		367		
			$C_L = 3.3\text{ }\mu\text{F}$		395		
t_f	V_{OUT} fall time	$R_L = 500\text{ }\Omega$	$C_L = 0.1\text{ }\mu\text{F}$		21		μs
			$C_L = 1\text{ }\mu\text{F}$		189		
			$C_L = 3.3\text{ }\mu\text{F}$		565		

SWITCHING CHARACTERISTICS

 $V_{IN} = 1.2\text{ V}$, $T_A = 25^\circ\text{C}$, $R_{L_CHIP} = 120\ \Omega$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{ON}	Turn-ON time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		471		μs
			$C_L = 1\ \mu\text{F}$		527		
			$C_L = 3.3\ \mu\text{F}$		587		
t_{OFF}	Turn-OFF time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		10		μs
			$C_L = 1\ \mu\text{F}$		61		
			$C_L = 3.3\ \mu\text{F}$		199		
t_r	V_{OUT} rise time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		324		μs
			$C_L = 1\ \mu\text{F}$		325		
			$C_L = 3.3\ \mu\text{F}$		350		
t_f	V_{OUT} fall time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		20		μs
			$C_L = 1\ \mu\text{F}$		175		
			$C_L = 3.3\ \mu\text{F}$		523		

SWITCHING CHARACTERISTICS

 $V_{IN} = 1.8\text{ V}$, $T_A = 25^\circ\text{C}$, $R_{L_CHIP} = 120\ \Omega$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{ON}	Turn-ON time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		302		μs
			$C_L = 1\ \mu\text{F}$		335		
			$C_L = 3.3\ \mu\text{F}$		367		
t_{OFF}	Turn-OFF time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		8		μs
			$C_L = 1\ \mu\text{F}$		49		
			$C_L = 3.3\ \mu\text{F}$		167		
t_r	V_{OUT} rise time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		220		μs
			$C_L = 1\ \mu\text{F}$		220		
			$C_L = 3.3\ \mu\text{F}$		235		
t_f	V_{OUT} fall time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		15		μs
			$C_L = 1\ \mu\text{F}$		159		
			$C_L = 3.3\ \mu\text{F}$		481		

SWITCHING CHARACTERISTICS

$V_{IN} = 2.5\text{ V}$, $T_A = 25^\circ\text{C}$, $R_{L_CHIP} = 120\ \Omega$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{ON}	Turn-ON time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		223		μs
			$C_L = 1\ \mu\text{F}$		246		
			$C_L = 3.3\ \mu\text{F}$		268		
t_{OFF}	Turn-OFF time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		7		μs
			$C_L = 1\ \mu\text{F}$		47		
			$C_L = 3.3\ \mu\text{F}$		158		
t_r	V_{OUT} rise time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		175		μs
			$C_L = 1\ \mu\text{F}$		175		
			$C_L = 3.3\ \mu\text{F}$		187		
t_f	V_{OUT} fall time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		18		μs
			$C_L = 1\ \mu\text{F}$		185		
			$C_L = 3.3\ \mu\text{F}$		471		

SWITCHING CHARACTERISTICS

$V_{IN} = 3\text{ V}$, $T_A = 25^\circ\text{C}$, $R_{L_CHIP} = 120\ \Omega$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{ON}	Turn-ON time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		191		μs
			$C_L = 1\ \mu\text{F}$		211		
			$C_L = 3.3\ \mu\text{F}$		231		
t_{OFF}	Turn-OFF time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		7		μs
			$C_L = 1\ \mu\text{F}$		46		
			$C_L = 3.3\ \mu\text{F}$		156		
t_r	V_{OUT} rise time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		159		μs
			$C_L = 1\ \mu\text{F}$		160		
			$C_L = 3.3\ \mu\text{F}$		170		
t_f	V_{OUT} fall time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		17		μs
			$C_L = 1\ \mu\text{F}$		160		
			$C_L = 3.3\ \mu\text{F}$		473		

SWITCHING CHARACTERISTICS

 $V_{IN} = 3.6\text{ V}$, $T_A = 25^\circ\text{C}$, $R_{L_CHIP} = 120\ \Omega$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{ON}	Turn-ON time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		166		μs
			$C_L = 1\ \mu\text{F}$		183		
			$C_L = 3.3\ \mu\text{F}$		201		
t_{OFF}	Turn-OFF time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		7		μs
			$C_L = 1\ \mu\text{F}$		45		
			$C_L = 3.3\ \mu\text{F}$		155		
t_r	V_{OUT} rise time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		146		μs
			$C_L = 1\ \mu\text{F}$		146		
			$C_L = 3.3\ \mu\text{F}$		156		
t_f	V_{OUT} fall time	$R_L = 500\ \Omega$	$C_L = 0.1\ \mu\text{F}$		17		μs
			$C_L = 1\ \mu\text{F}$		161		
			$C_L = 3.3\ \mu\text{F}$		475		

TYPICAL CHARACTERISTICS

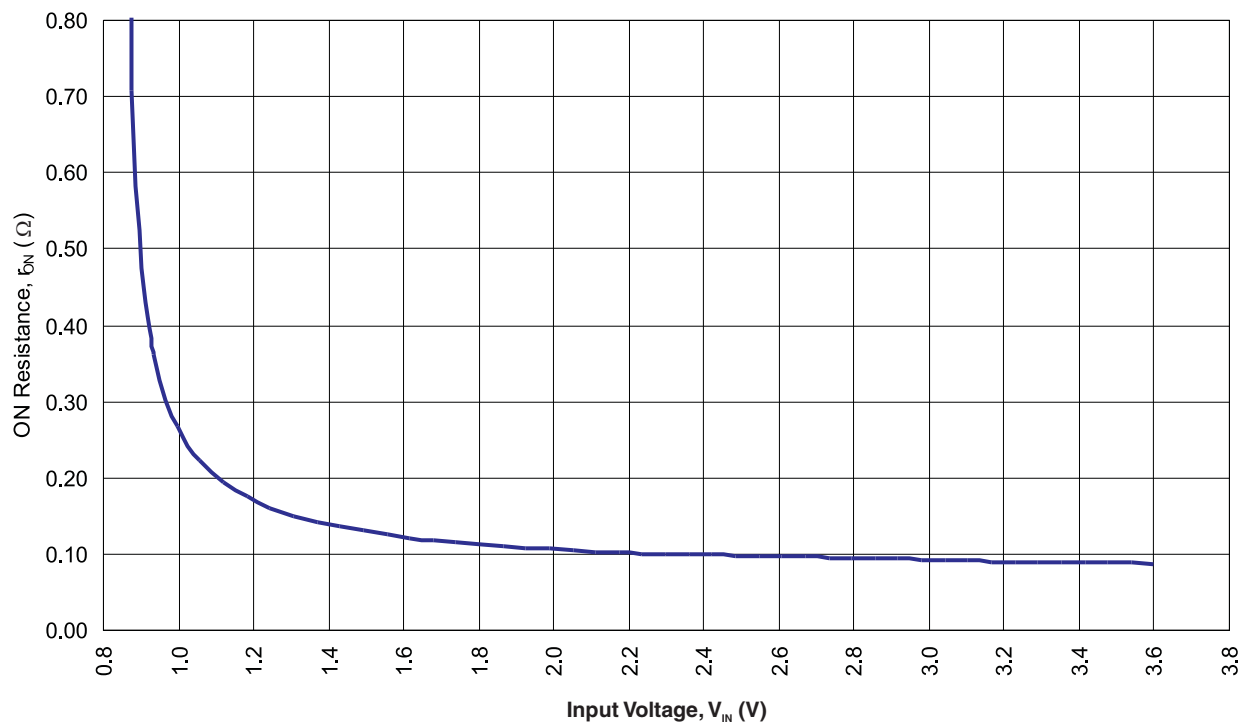
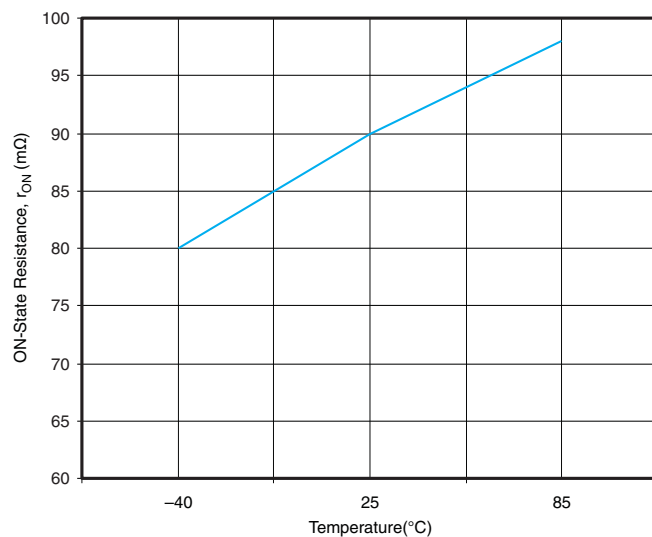
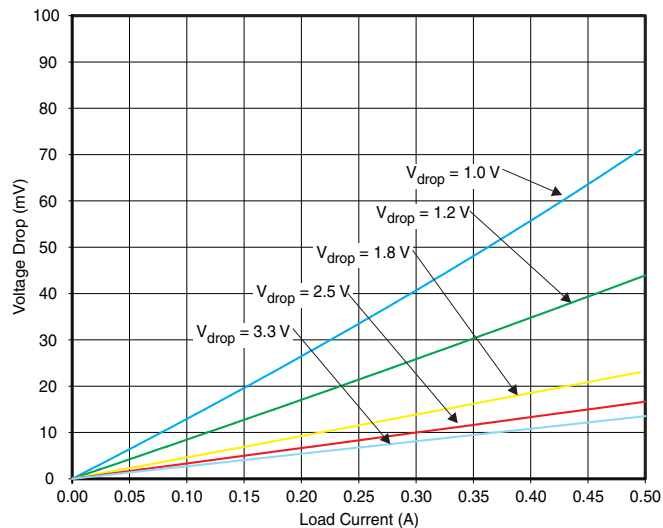
Figure 2. r_{ON} vs V_{IN} Figure 3. r_{ON} vs Temperature ($V_{IN} = 3.3\text{ V}$)

Figure 4. Voltage Drop vs. Load Current

TYPICAL CHARACTERISTICS (continued)

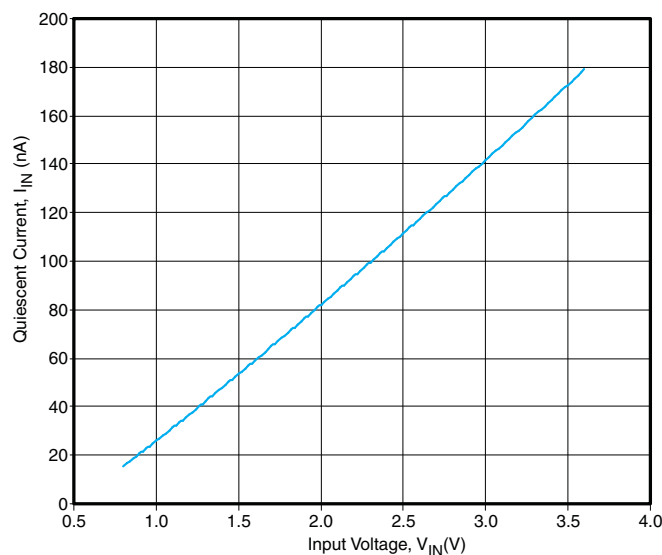


Figure 5. Quiescent Current vs V_{IN} ($V_{ON} = V_{IN}$, $I_{OUT} = 0$)

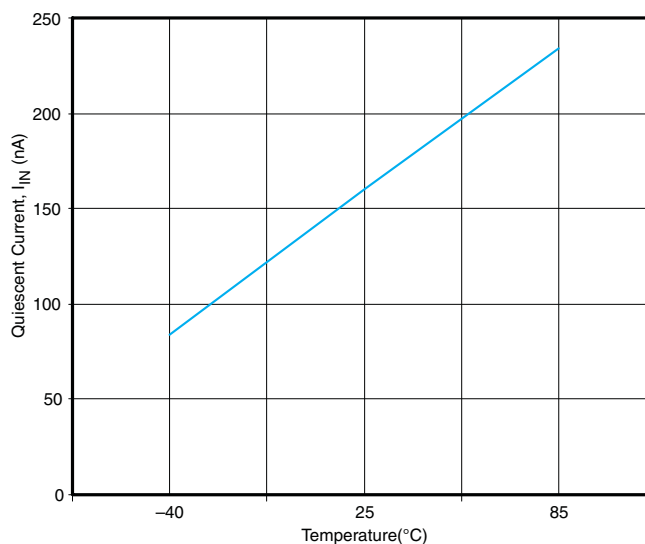


Figure 6. Quiescent Current vs Temperature ($V_{IN} = 3.3$ V, $I_{OUT} = 0$)

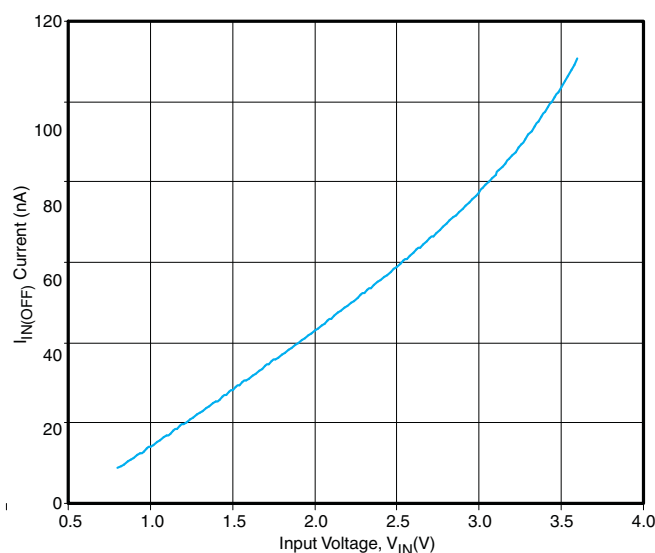


Figure 7. $I_{IN(OFF)}$ vs V_{IN} ($V_{ON} = 0$ V)

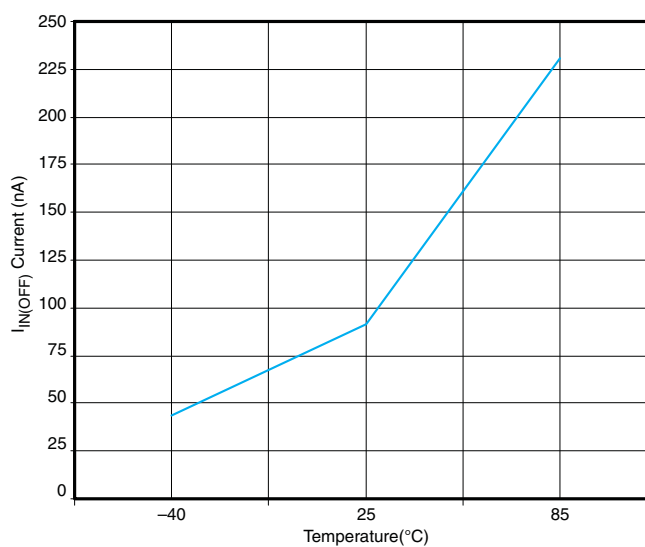


Figure 8. $I_{IN(OFF)}$ vs Temperature ($V_{IN} = 3.3$ V)

TYPICAL CHARACTERISTICS (continued)

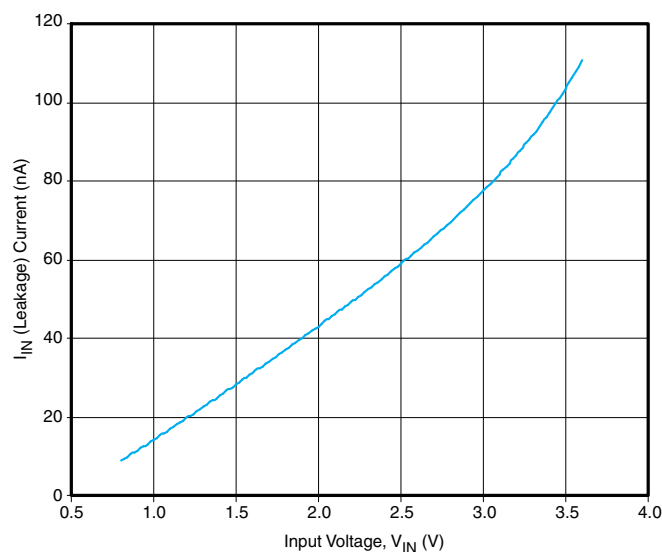
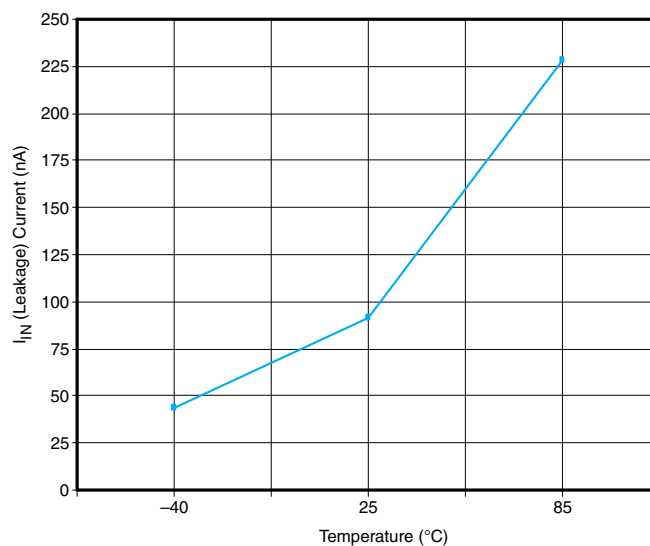
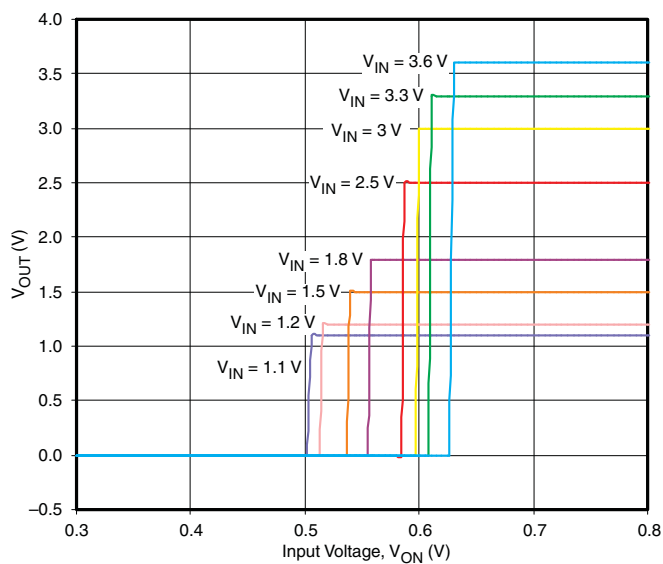
Figure 9. I_{IN} (Leakage) vs V_{IN} ($I_{OUT} = 0$)Figure 10. I_{IN} (Leakage) vs Temperature ($V_{IN} = 3.3 \text{ V}$)

Figure 11. ON-Input Threshold

TYPICAL CHARACTERISTICS (continued)

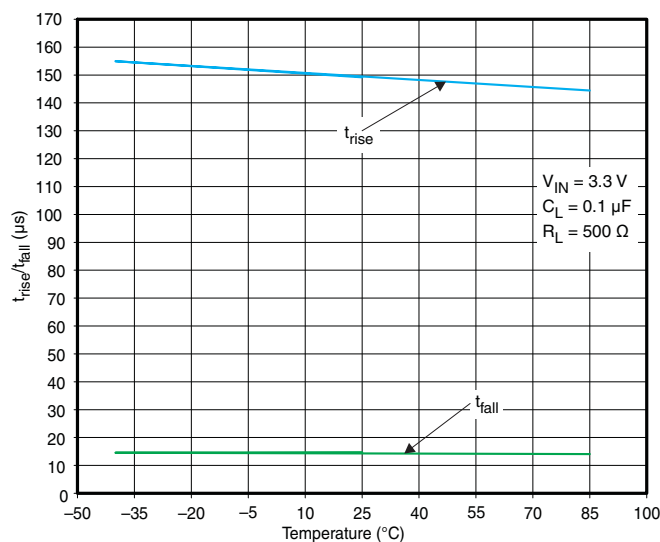


Figure 12. t_{rise}/t_{fall} vs Temperature

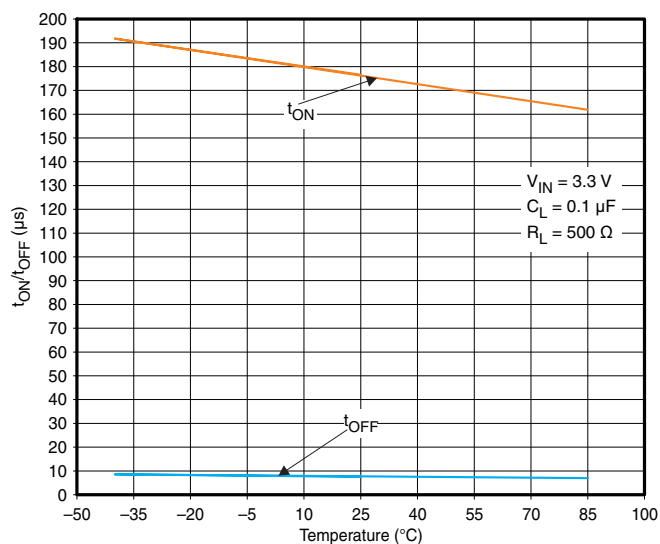


Figure 13. t_{ON}/t_{OFF} vs Temperature

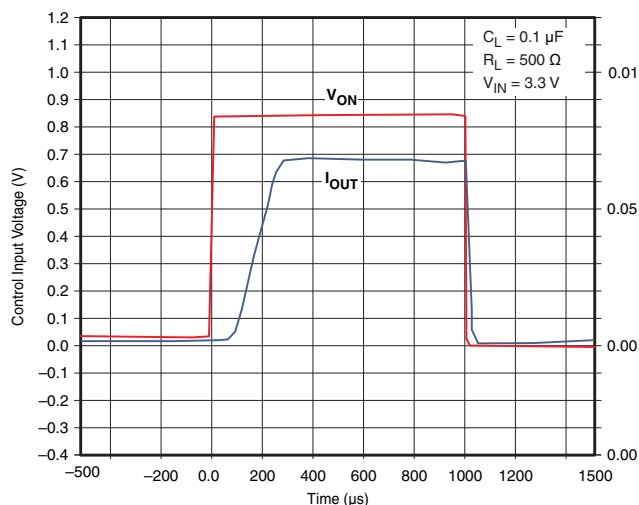


Figure 14. t_{ON} Response

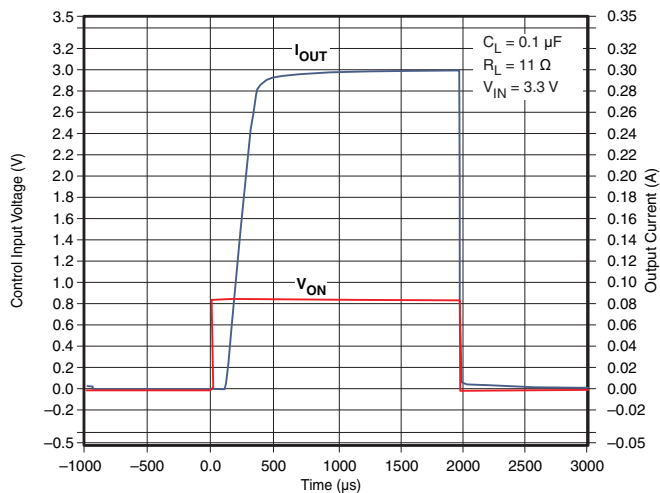
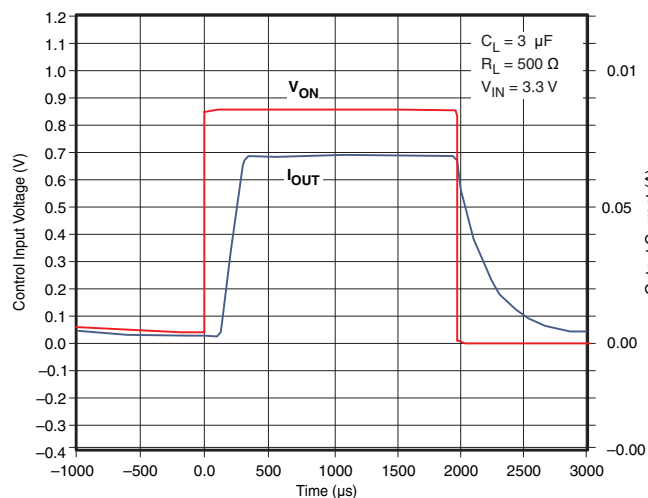
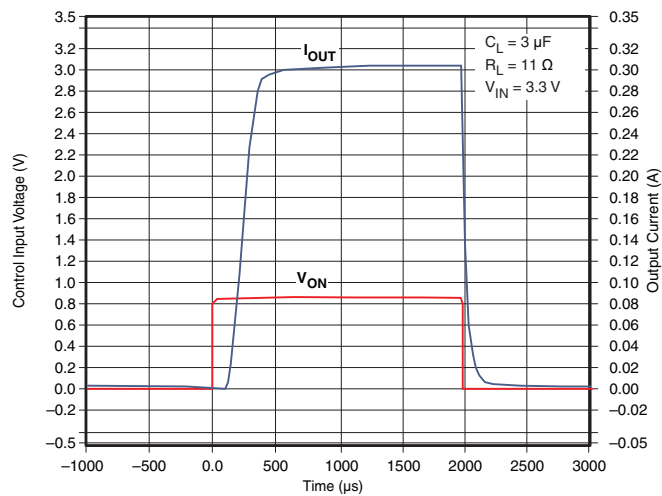
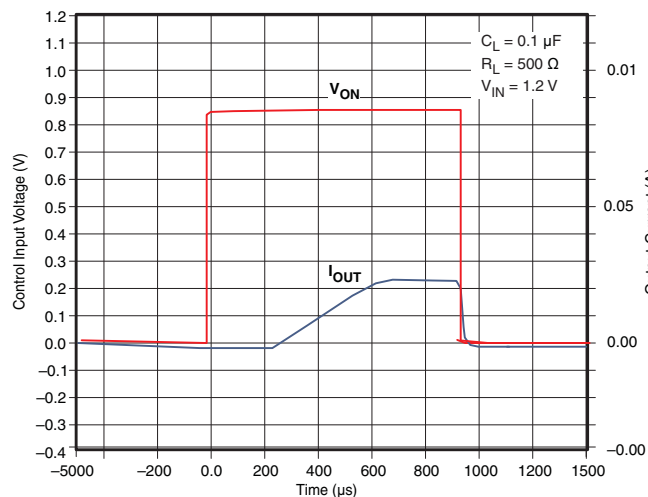
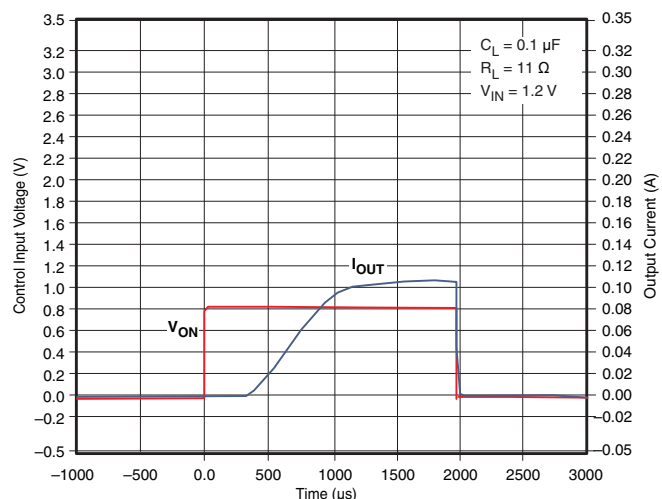
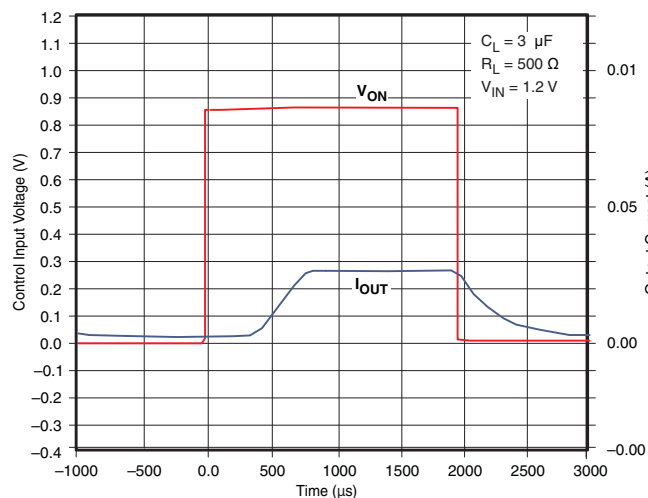
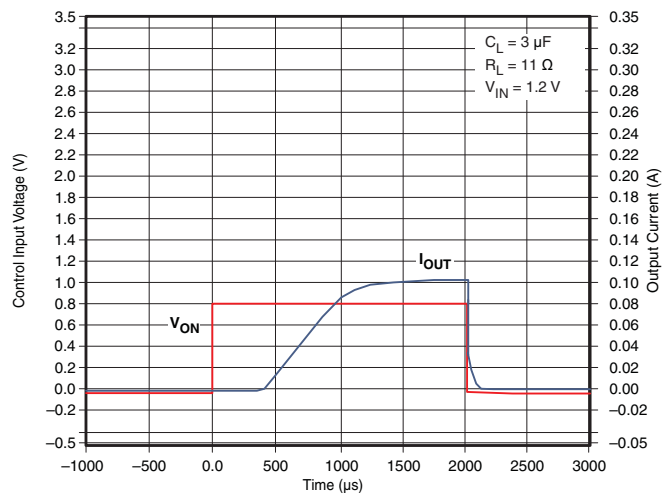


Figure 15. t_{ON} Response

TYPICAL CHARACTERISTICS (continued)

Figure 16. t_{ON} ResponseFigure 17. t_{ON} ResponseFigure 18. t_{ON} ResponseFigure 19. t_{ON} ResponseFigure 20. t_{ON} ResponseFigure 21. t_{ON} Response

TYPICAL CHARACTERISTICS (continued)

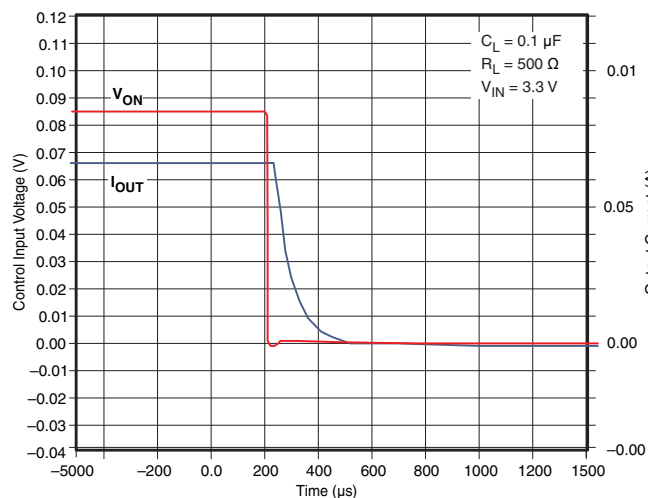


Figure 22. t_{OFF} Response

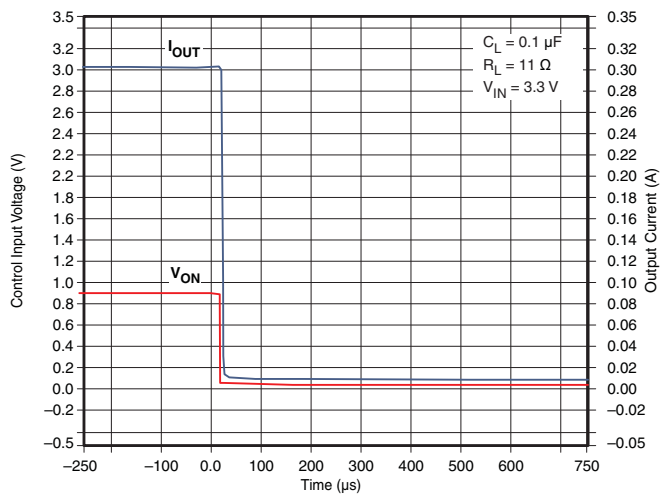


Figure 23. t_{OFF} Response

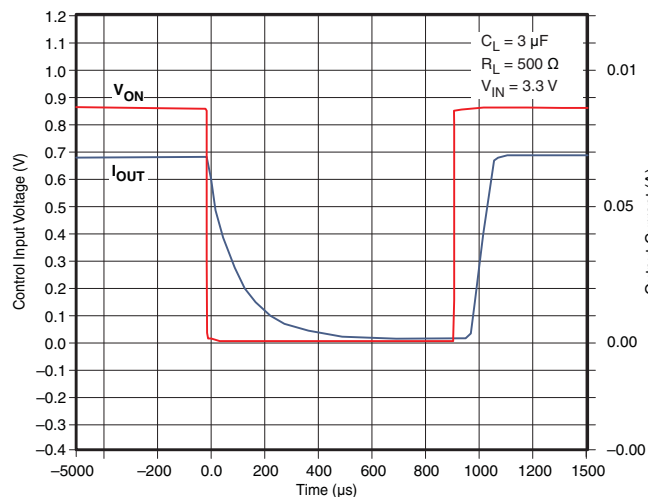


Figure 24. t_{OFF} Response

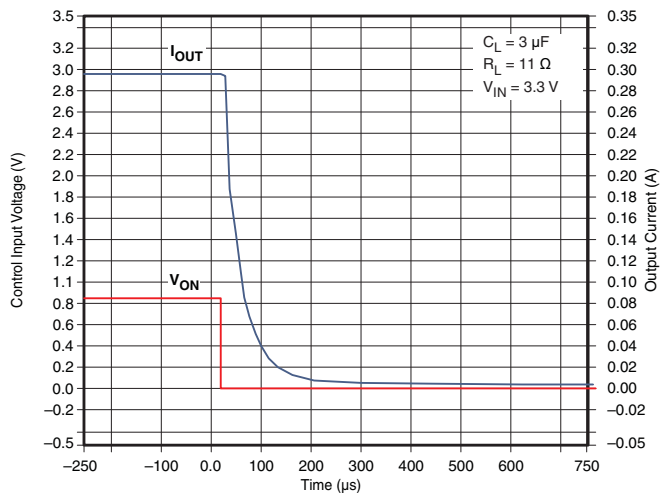


Figure 25. t_{OFF} Response

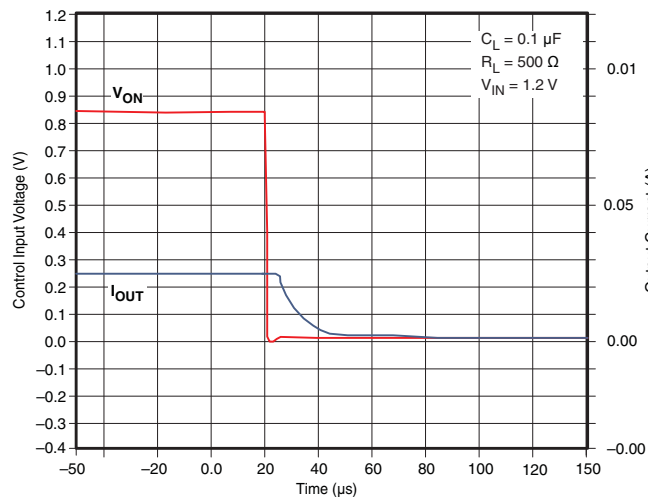


Figure 26. t_{OFF} Response

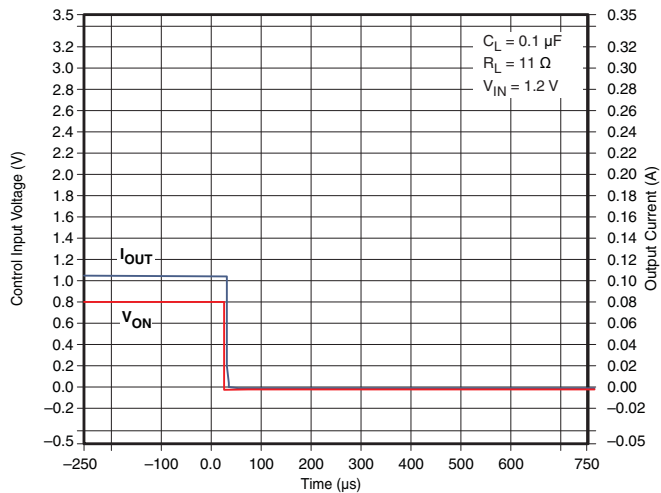
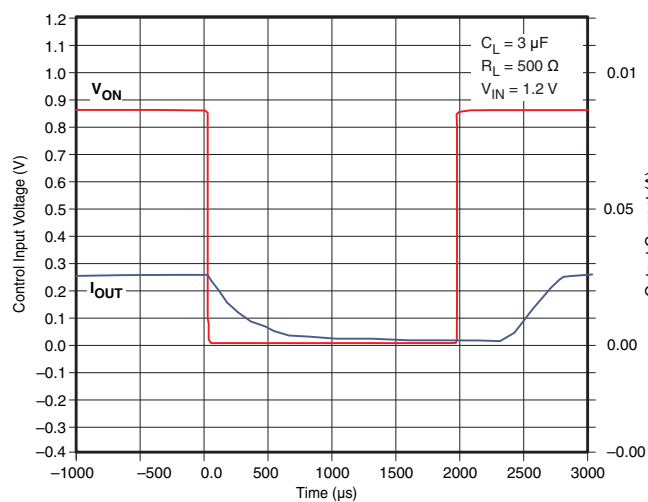
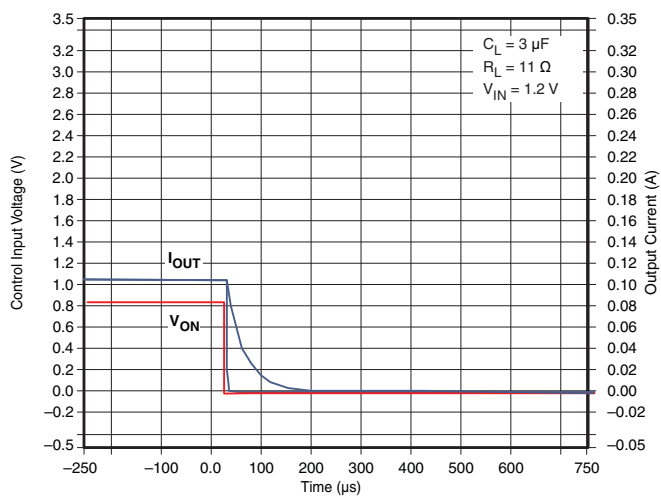
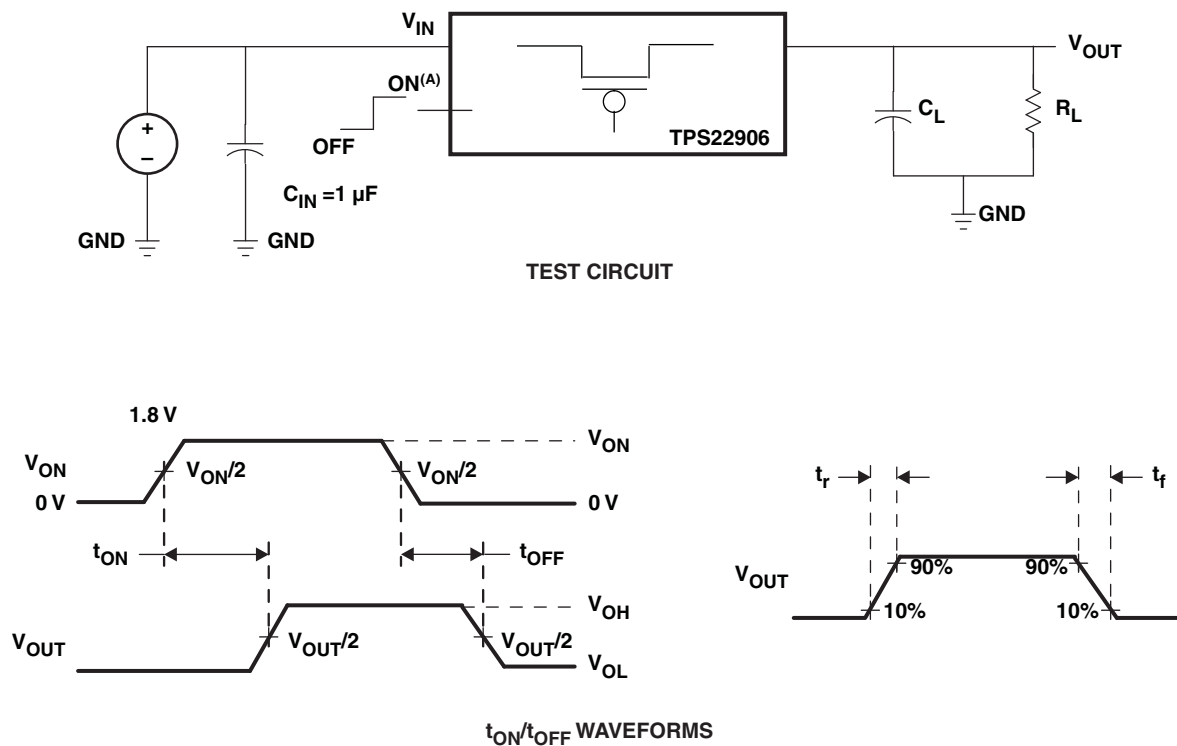


Figure 27. t_{OFF} Response

TYPICAL CHARACTERISTICS (continued)

Figure 28. t_{OFF} ResponseFigure 29. t_{OFF} Response

PARAMETER MEASUREMENT INFORMATION



A. t_{rise} and t_{fall} of the control signal is 100 ns.

Figure 30. Test Circuit and t_{ON}/t_{OFF} Waveforms

APPLICATION INFORMATION

ON/OFF Control

The ON pin controls the state of the switch. Activating ON continuously holds the switch in the on state so long as there is no fault. ON is active HI and has a low threshold making it capable of interfacing with low voltage signals. The ON pin is compatible with standard GPIO logic threshold. It can be used with any microcontroller with 1.2-V, 1.8-V, 2.5-V, or 3.3-V GPIOs.

Input Capacitor

To limit the voltage drop on the input supply caused by transient in-rush currents when the switch turns on into a discharged load capacitor or short-circuit, a capacitor needs to be placed between V_{IN} and GND. A 1- μ F ceramic capacitor, C_{IN} , placed close to the pins is usually sufficient. Higher values of C_{IN} can be used to further reduce the voltage drop during high current application. When switching heavy loads, it is recommended to have an input capacitor approximately 10 times higher than the output capacitor to avoid excessive voltage drop.

Output Capacitor

Due to the integral body diode in the PMOS switch, a C_{IN} greater than C_L is highly recommended. A C_L greater than C_{IN} can cause V_{OUT} to exceed V_{IN} when the system supply is removed. This could result in current flow through the body diode from V_{OUT} to V_{IN} .

Board Layout

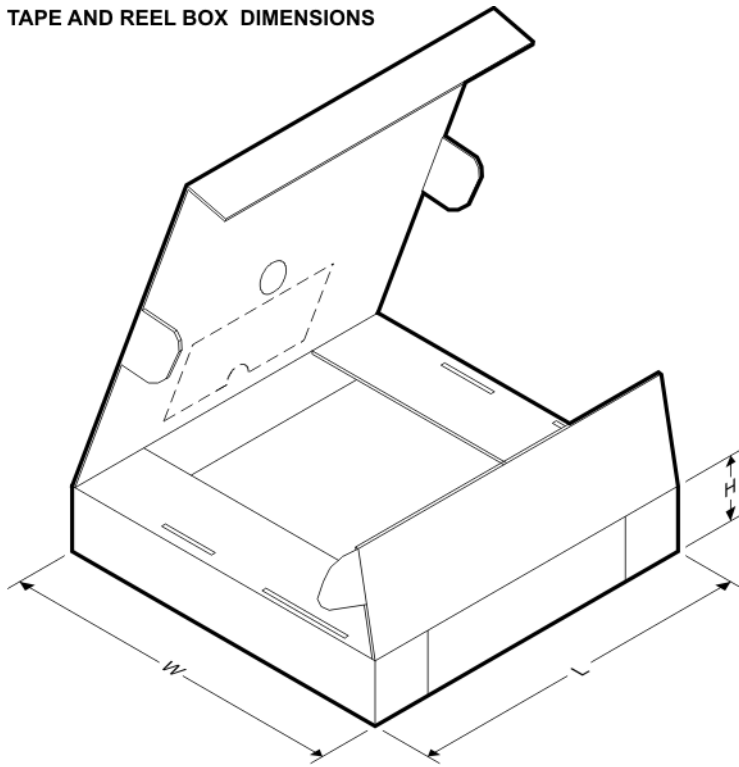
For best performance, all traces should be as short as possible. To be most effective, the input and output capacitors should be placed close to the device to minimize the effects that parasitic trace inductances may have on normal and short-circuit operation. Using wide traces for V_{IN} , V_{OUT} , and GND helps minimize the parasitic electrical effects along with minimizing the case to ambient thermal impedance.

TAPE AND REEL INFORMATION


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TPS22906YZVR	DSBGA	YZV	4	3000	180.0	8.4	1.0	1.0	0.63	4.0	8.0	Q1

TAPE AND REEL BOX DIMENSIONS

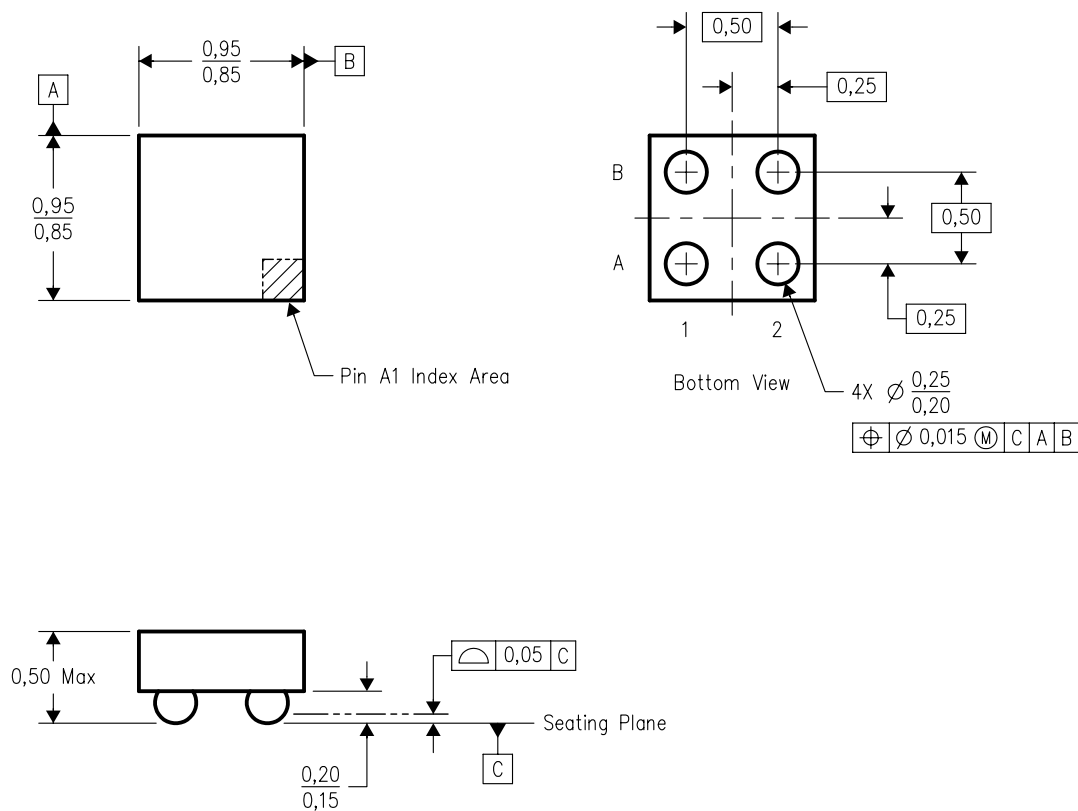


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TPS22906YZVR	DSBGA	YZV	4	3000	220.0	220.0	34.0

YZV (S-XBGA-N4)

DIE-SIZE BALL GRID ARRAY



4206083/A 05/2004

- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. NanoFree™ package configuration.
 - D. This package contains lead-free balls. Refer to the 4 YEV package (drawing 4206082) for tin-lead (SnPb) balls.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Applications Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community

e2e.ti.com