5V DUAL CHANNEL PROGRAMMABLE LOAD SWITCH

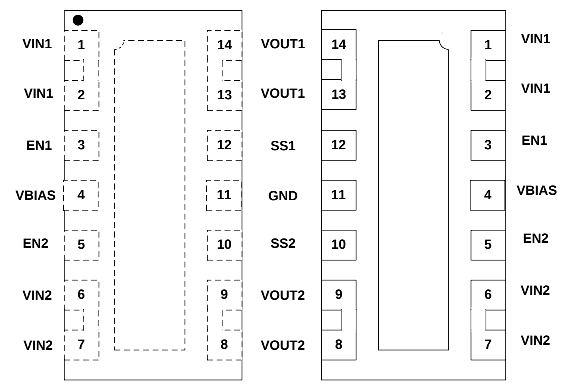
Description

AP22966 is an integrated dual N-channel load switch which features an adjustable slew rate that can be set using an external capacitor independently for each channel. The N-Channel MOSFETs have a typical R_{ON} of 18mΩ, enabling current handling capability of up to 6A. Both channels can independently be controlled with low voltage logic signals.

AP22966 is designed to operate from 0.8V to 5.5V. The low quiescent supply current makes it ideal for use in battery powered distribution systems where power consumption is a concern.

AP22966 is available in a standard Green V-DFN3020-14 package with exposed PAD for improved thermal performance and is RoHS compliant.

Pin Assignments



V-DFN3020-14

Features

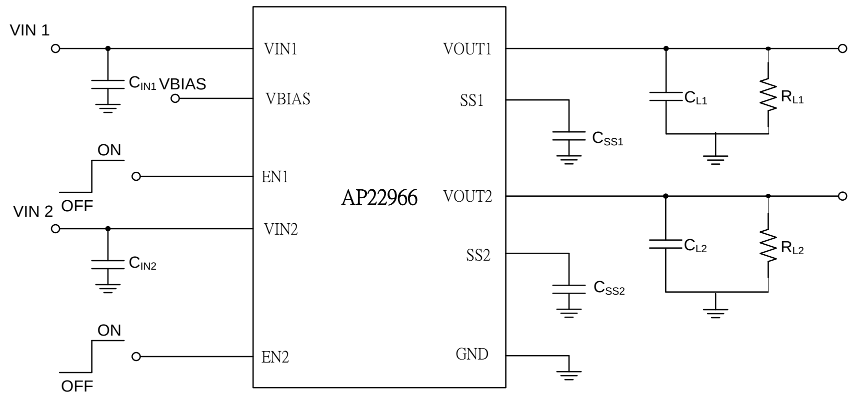
- Integrated Dual Channel Load Switch
- 0.8V to 5.5V Input Voltage Range
- Low Typical R_{ON} of 18mΩ (V_{BIAS} = 5V)
- 6A Maximum Continuous Current per Channel
- Very Low Quiescent Current
  - 60μA (Both Channels)
  - 45μA (Single Channel)
- Per Channel Adjustable Slew Rate
- Internal Quick Output Discharge (QOD)
- Low Voltage Logic Enable
  - 1.2/1.8/2.5/3.3V Logic
- Small Form Factor Package V-DFN3020-14 – Footprint of just $6mm^2$
- Thermally Efficient Low Profile Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Applications

- Ultrabooks
- Notebooks
- Netbooks
- SetTop Boxes
- SSD (Solid State Drives)
- Consumer Electronics
- Tablet PC
- Telecom Systems

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

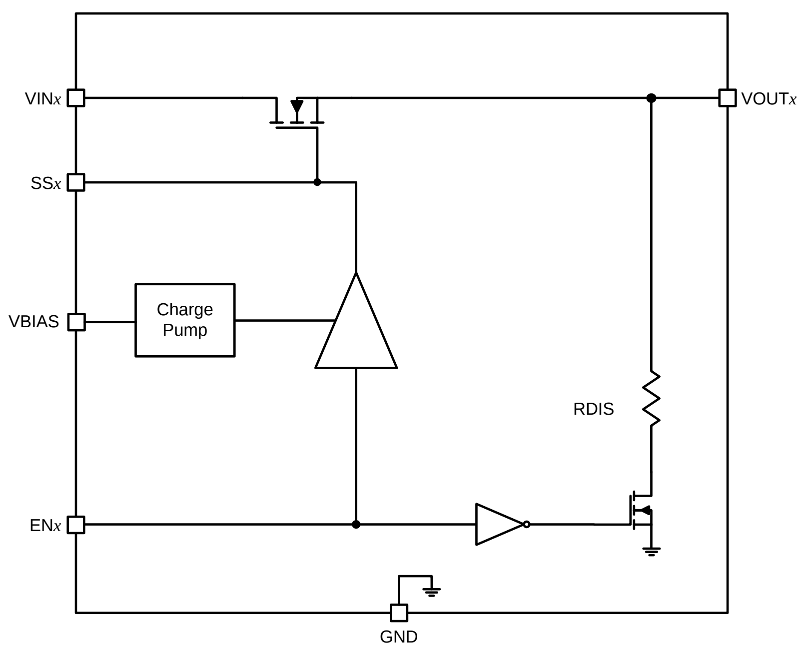
Typical Applications Circuit



Pin Descriptions

Pin Name	Pin Number	Function
VIN1	1, 2	Channel 1 input. Recommended voltage range for this pin for optimal R_{ON} performance from 0.8V to V_{BIAS}. Place an optional decoupling capacitor between this pin and GND for reduce V_{IN} dip during turn on.
EN1	3	Active High Channel 1 enable input
VBIAS	4	V_{BIAS} Voltage. Recommended voltage range from 2.5V to 5.5V.
EN2	5	Active High Channel 2 enable input
VIN2	6, 7	Channel 2 input. Recommended voltage range for this pin for optimal R_{ON} performance from 0.8V to V_{BIAS}. Place an optional decoupling capacitor between this pin and GND for reduce V_{IN} dip during turn on.
VOUT2	8, 9	Channel 2 output This pin connects to the Source of the 2nd N-channel MOSFET.
SS2	10	Channel 2 slew rate control An external capacitor connected to this pin will set the ramp-up time for Channel 2 output.
GND	11/PAD	Ground Connect Pin 11 and PAD together to system ground.
SS1	12	Channel 1 slew rate control An external capacitor connected to this pin will set the ramp-up time for Channel 1 output.
VOUT1	13, 14	Channel 1 output This pin connects to the Source of the 1st N-channel MOSFET

Functional Block Diagram



where *x* is the channel number (1 or 2)

NEW PRODUCT

Absolute Maximum Ratings (@ T_A = +25°C, unless otherwise specified.) (Note 4)

Symbol	Parameter		Ratings	Unit
ESD HBM	Human Body ESD Protection		4000	V
ESD MM	Machine Model ESD Protection		300	V
ESD CDM	Charged Device Model ESD Protection		1000	V
V_{IN}	Input Voltage at VIN1, VIN2 Pin		-0.3 to +6	V
V_{BIAS}	Bias Supply Voltage		-0.3 to +6	V
V_{OUT}	Output Voltage at VOUT1, VOUT2 Pin		-0.3 to +6	V
V_{EN}	Enable Voltage at EN1, EN2 Pin		-0.3 to +6	V
I_L	Load Current per Channel		6	A
I_{PLS}	Maximum Pulsed Switch Current per Channel, Pulse <300µs, 2% Duty Cycle		8	A
$T_{J(max)}$	Maximum Junction Temperature		+125	°C
T_{ST}	Storage Temperature		-65 to +150	°C
P_D	Power Dissipation	(Note 5) V-DFN3020-14	2.7	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	(Note 5) V-DFN3020-14	47	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	(Note 6) V-DFN3020-14	8	°C/W

Notes:
4. Stresses greater than the 'Absolute Maximum Ratings' specified above may cause permanent damage to the device. These are stress ratings only; functional operation of the device at these or any other conditions exceeding those indicated in this specification is not implied. Device reliability may be affected by exposure to absolute maximum rating conditions for extended periods of time.
5. Device mounted on 2" x 2" FR-4 substrate PCB, 2oz copper, with minimum recommended pad layout.
6. Thermal resistance from junction to case.

Recommended Operating Conditions (For each channel)

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Voltage Range at VIN1, VIN2 Pin	0.8	V_{BIAS}	V
V_{BIAS}	Bias Supply Voltage Range	2.5	5.5	V
V_{EN}	Enable Voltage Range at EN1, EN2 Pin	0	5.5	V
V_{OUT}	Output Voltage at VOUT1, VOUT2 Pin	—	V_{IN}	V
T_A	Operating Ambient Temperature	-40	+85	°C
C_{IN}	Input Capacitor	1	—	µF
V_{IH_EN}	EN Input Logic High Voltage	1.2	5.5	V
V_{IL_EN}	EN Input Logic Low Voltage	0	0.5	V

NEW PRODUCT

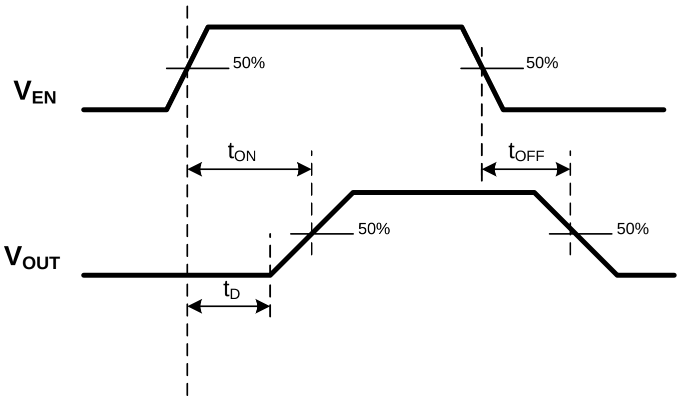
Electrical Characteristics (For each channel @ T_A = -40°C to +85°C, V_{IN} = 0.8V to 5.5V, V_{BIAS} = 5V, C_{IN} = 1µF, C_L = 100nF, typical values are at T_A = +25°C, unless otherwise specified.)

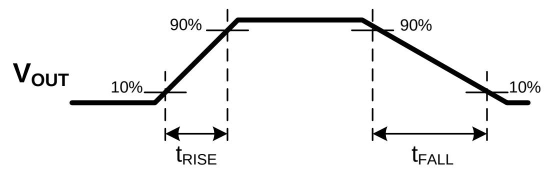
Symbol	Parameters	Conditions		Min	Typ	Max	Unit
I_{BIAS_Q}	VBIAS Quiescent Current (Both Channels)	V_{EN} = V_{IN} = V_{BIAS} = 5V, I_{OUT} = 0A		—	60	110	µA
I_{BIAS_Q}	VBIAS Quiescent Current (Single Channels)	V_{EN1} = V_{IN} = V_{BIAS} = 5V, V_{EN2} = 0V, I_{OUT} = 0A		—	45	—	µA
I_{BIAS_OFF}	VBIAS Off Supply Current	V_{EN} = 0V, V_{OUT} = 0V		—	—	2	µA
I_{IN_SD}	Input Shutdown Current (Per Channel)	V_{EN} = 0V V_{OUT} = 0V	V_{IN} = 5V	—	0.5	17	µA
			V_{IN} = 3.3V	—	0.1	6	µA
			V_{IN} = 1.8V	—	0.07	3	µA
			V_{IN} = 0.8V	—	0.04	2	µA
R_{ON}	Load Switch On-Resistance	V_{EN} = V_{BIAS}, I_{OUT} = 200mA T_A = +25°C	V_{IN} = 5V	—	17	24	mΩ
			V_{IN} = 3.3V	—	17	24	mΩ
			V_{IN} = 1.8V	—	17	24	mΩ
			V_{IN} = 1.5V	—	17	24	mΩ
			V_{IN} = 1.2V	—	17	24	mΩ
			V_{IN} = 0.8V	—	17	24	mΩ
R_{ON}	Load Switch On-Resistance	V_{EN} = V_{BIAS}, I_{OUT} = 200mA T_A = -40°C to +85°C	V_{IN} = 5V	—	—	26	mΩ
			V_{IN} = 3.3V	—	—	26	mΩ
			V_{IN} = 1.8V	—	—	26	mΩ
			V_{IN} = 1.5V	—	—	26	mΩ
			V_{IN} = 1.2V	—	—	26	mΩ
			V_{IN} = 0.8V	—	—	26	mΩ
I_{LEAK_EN}	EN Input Leakage	V_{EN} = 5.5V		—	—	1	µA
R_{DIS}	Discharge FET On-Resistance	V_{EN} = 0V, I_{DIS} = 10mA, T_A = +25°C		—	220	300	Ω

Electrical Characteristics (For each channel @ T_A = -40°C to +85°C, V_{IN} = 0.8V to 5.5V, V_{BIAS} = 2.5V, C_{IN} = 1µF, C_L = 100nF, typical values are at T_A = +25°C, unless otherwise specified.)

Symbol	Parameters	Conditions		Min	Typ	Max	Unit
I_{BIAS_Q}	VBIAS Quiescent Current (Both Channels)	V_{EN} = V_{IN} = V_{BIAS} = 2.5V, I_{OUT} = 0A		—	28	46	µA
I_{BIAS_Q}	VBIAS Quiescent Current (Single Channels)	V_{EN1} = V_{IN} = V_{BIAS} = 2.5V, V_{EN2} = 0V, I_{OUT} = 0A		—	20	—	µA
I_{BIAS_OFF}	VBIAS Off Supply Current	V_{EN} = 0V, V_{OUT} = 0V		—	—	2	µA
I_{IN_SD}	Input Shutdown Current	V_{EN} = 0V V_{OUT} = 0V	V_{IN} = 2.5V	—	0.13	4	µA
			V_{IN} = 1.8V	—	0.07	3	µA
			V_{IN} = 1.2V	—	0.05	2	µA
			V_{IN} = 0.8V	—	0.04	2	µA
R_{ON}	Load Switch On-Resistance	V_{EN} = V_{BIAS}, I_{OUT} = 200mA T_A = +25°C	V_{IN} = 2.5V	—	19	25	mΩ
			V_{IN} = 1.8V	—	18	25	mΩ
			V_{IN} = 1.5V	—	18	25	mΩ
			V_{IN} = 1.2V	—	18	25	mΩ
			V_{IN} = 0.8V	—	18	25	mΩ
R_{ON}	Load Switch On-Resistance	V_{EN} = V_{BIAS}, I_{OUT} = 200mA T_A = -40°C to +85°C	V_{IN} = 2.5V	—	—	27	mΩ
			V_{IN} = 1.8V	—	—	27	mΩ
			V_{IN} = 1.5V	—	—	27	mΩ
			V_{IN} = 1.2V	—	—	27	mΩ
			V_{IN} = 0.8V	—	—	27	mΩ
I_{LEAK_EN}	EN Input Leakage	V_{EN} = 5.5V		—	—	1	µA
R_{DIS}	Discharge FET On-Resistance	V_{EN} = 0V, I_{DIS} = 10mA, T_A = +25°C		—	220	300	Ω

Test Circuit and t_{ON}/t_{OFF} Waveforms



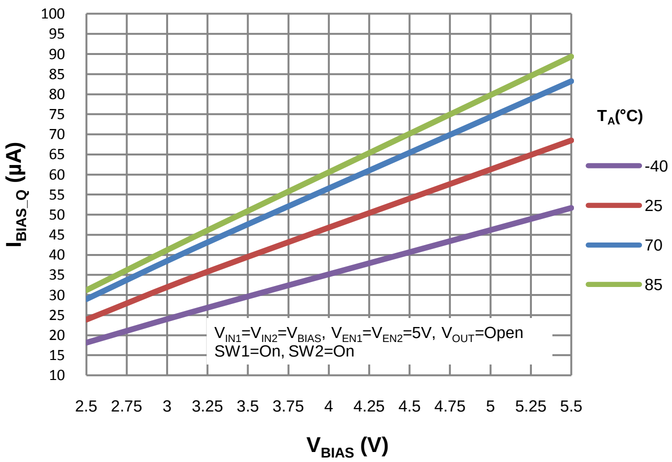


Switching Characteristics

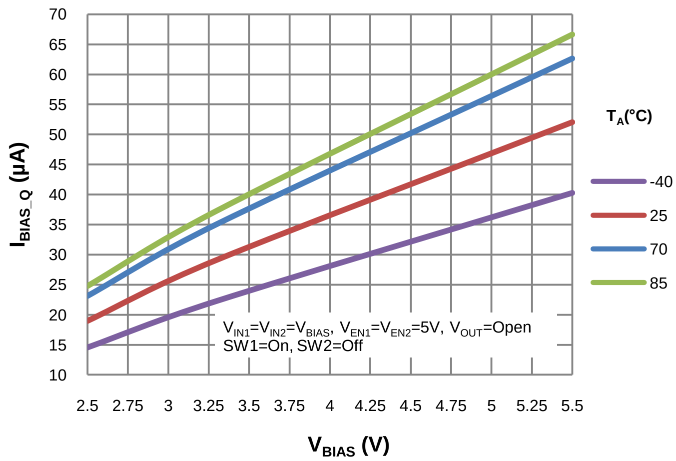
Symbol	Parameters	Conditions	Min	Typ	Max	Unit
$V_{IN} = V_{EN} = V_{BIAS} = 5V$, $T_A = +25°C$						
t_{RISE}	Output Rise-time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	1720	—	µs
t_{ON}	Output Turn-ON Delay Time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	1270	—	µs
t_{FALL}	Output Fall-time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	2.3	—	µs
t_{OFF}	Output Turn-OFF Delay Time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	9.6	—	µs
t_D	Output Start Delay	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	160	—	µs
$V_{IN} = 0.8V$, $V_{EN} = V_{BIAS} = 5V$, $T_A = +25°C$						
t_{RISE}	Output Rise-time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	330	—	µs
t_{ON}	Output Turn-ON Delay Time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	428	—	µs
t_{FALL}	Output Fall-time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	11	—	µs
t_{OFF}	Output Turn-OFF Delay Time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	146	—	µs
t_D	Output Start Delay	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	253	—	µs
$V_{IN} = 2.5V$, $V_{EN} = 5V$, $V_{BIAS} = 2.5V$, $T_A = +25°C$						
t_{RISE}	Output Rise-time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	1488	—	µs
t_{ON}	Output Turn-ON Delay Time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	1381	—	µs
t_{FALL}	Output Fall-time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	3	—	µs
t_{OFF}	Output Turn-OFF Delay Time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	11	—	µs
t_D	Output Start Delay	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	359	—	µs
$V_{IN} = 0.8V$, $V_{EN} = 5V$, $V_{BIAS} = 2.5V$, $T_A = +25°C$						
t_{RISE}	Output Rise-time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	561	—	µs
t_{ON}	Output Turn-ON Delay Time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	748	—	µs
t_{FALL}	Output Fall-time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	11	—	µs
t_{OFF}	Output Turn-OFF Delay Time	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	123	—	µs
t_D	Output Start Delay	$R_L = 10\Omega$, $C_{SS} = 1000pF$, $C_L = 0.1\mu F$	—	415	—	µs

Performance Characteristics (@T_A = +25°C, V_{BIAS} = 5V, unless otherwise specified.)

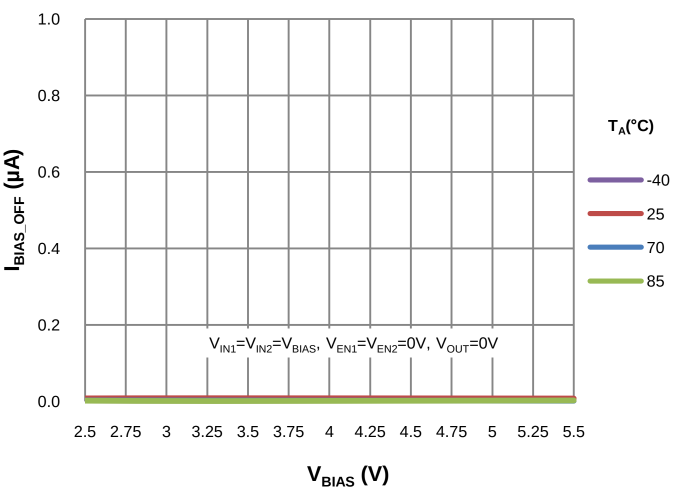
V_{BIAS} vs. QUIESCENT CURRENT (BOTH CHANNELS)



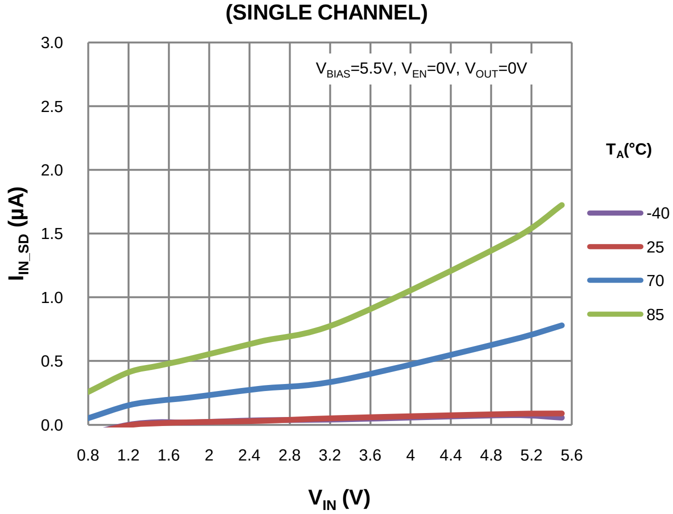
V_{BIAS} vs. QUIESCENT CURRENT (SINGLE CHANNEL)



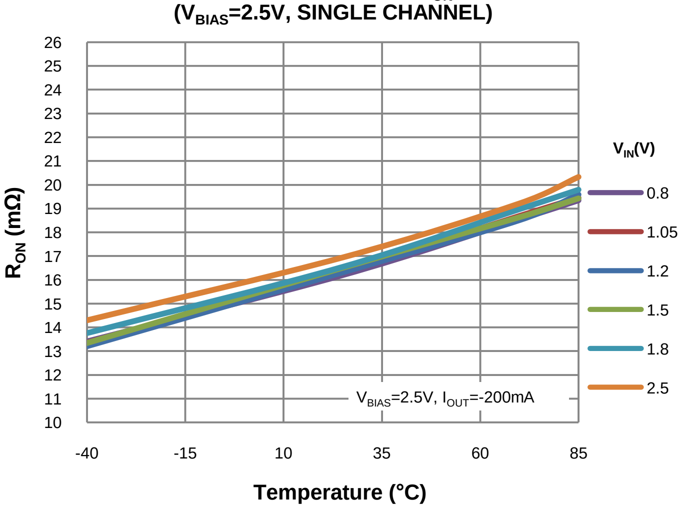
V_{BIAS} vs. SHUTDOWN CURRENT (BOTH CHANNELS)



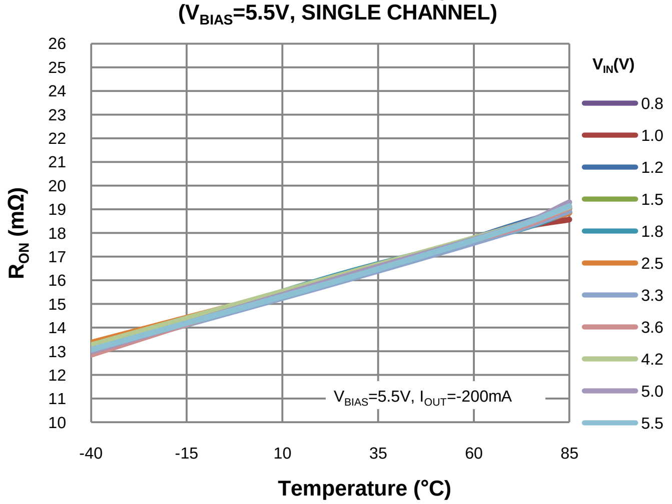
V_{IN} vs. OFF-STATE VIN CURRENT (SINGLE CHANNEL)



TEMPERATURE vs. R_{ON} (V_{BIAS}=2.5V, SINGLE CHANNEL)



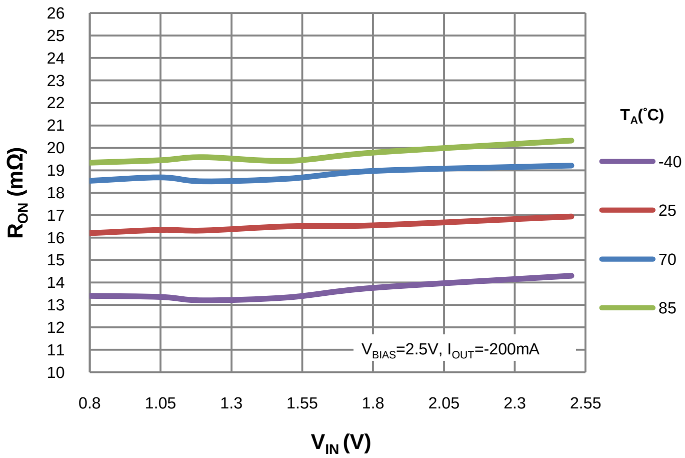
TEMPERATURE vs. R_{ON} (V_{BIAS}=5.5V, SINGLE CHANNEL)



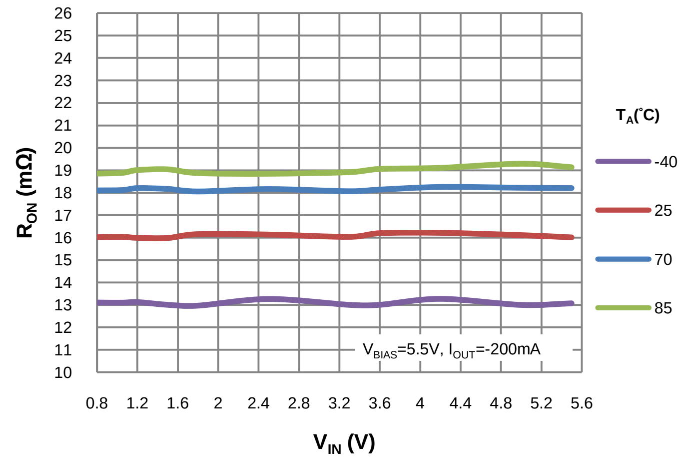
NEW PRODUCT

Performance Characteristics (Cont.) (@T_A = +25°C, V_{BIAS} = 5V, unless otherwise specified.)

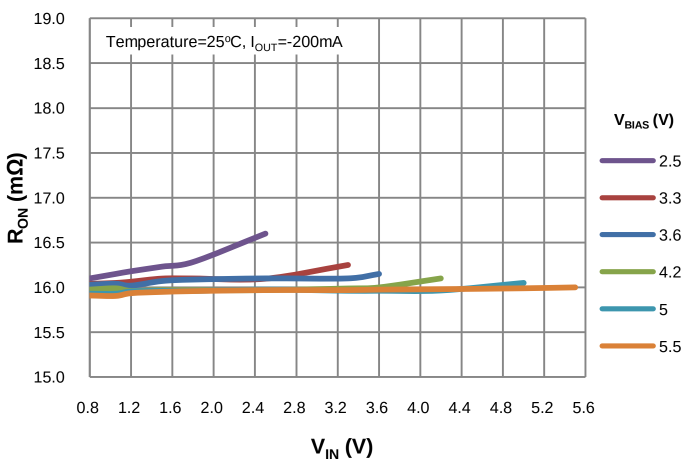
V_{IN} vs. R_{ON} (V_{BIAS}=2.5V, SINGLE CHANNEL)



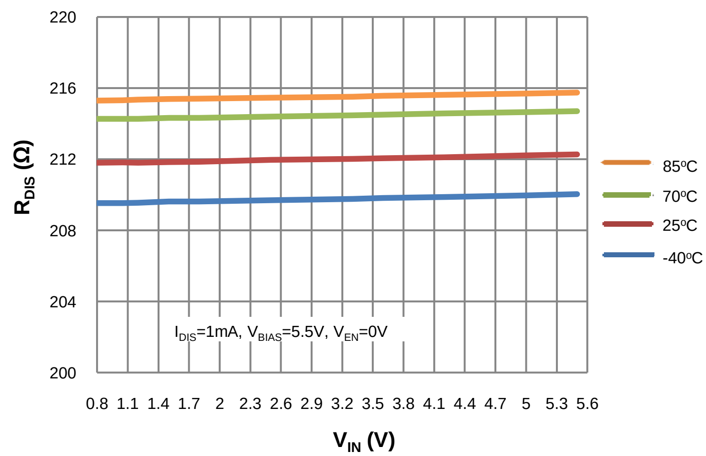
V_{IN} vs. R_{ON} (V_{BIAS}=5.5V, SINGLE CHANNEL)



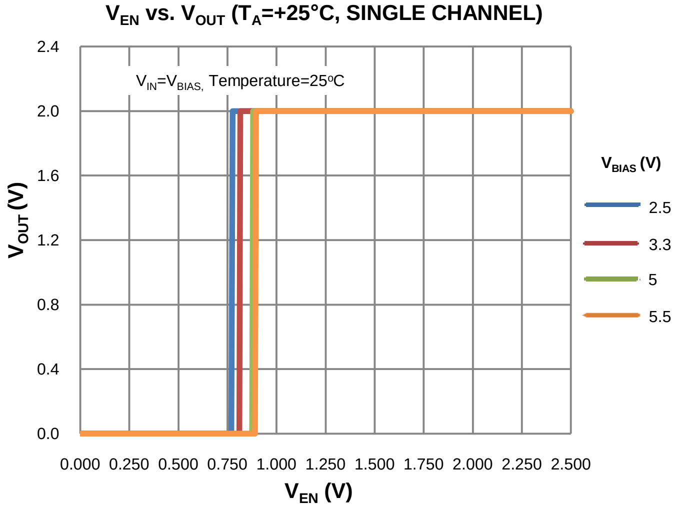
V_{IN} vs. R_{ON} (T_A=+25°C, SINGLE CHANNEL)



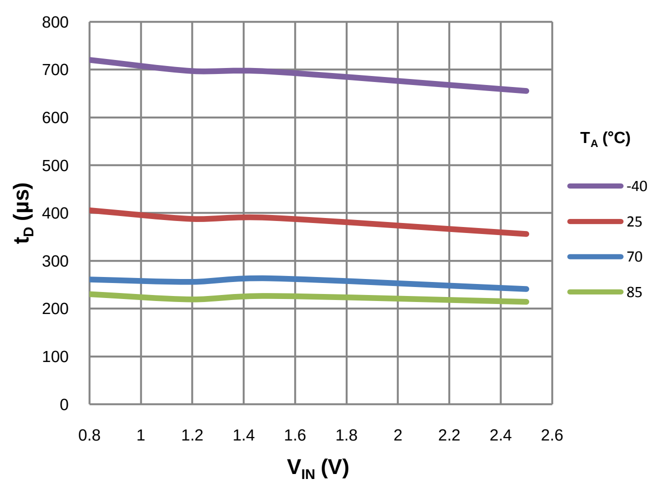
V_{IN} vs. R_{DIS} (V_{BIAS}=5.5V, SINGLE CHANNEL)



V_{EN} vs. V_{OUT} (T_A=+25°C, SINGLE CHANNEL)

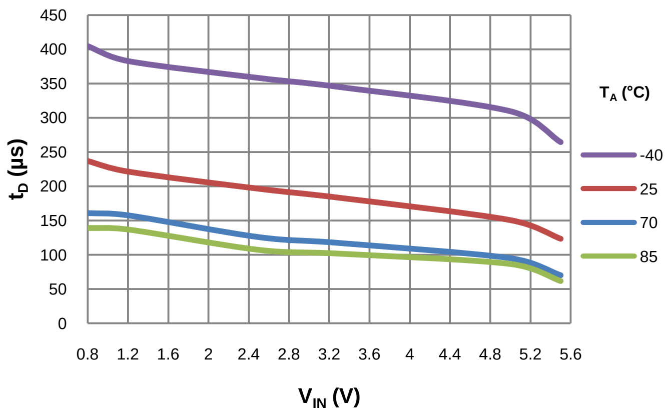


t_D vs V_{IN}, V_{BIAS}=2.5V
(C_{IN}=1μF, C_{SS}=1nF, R_L=10Ω, C_L=0.1μF)

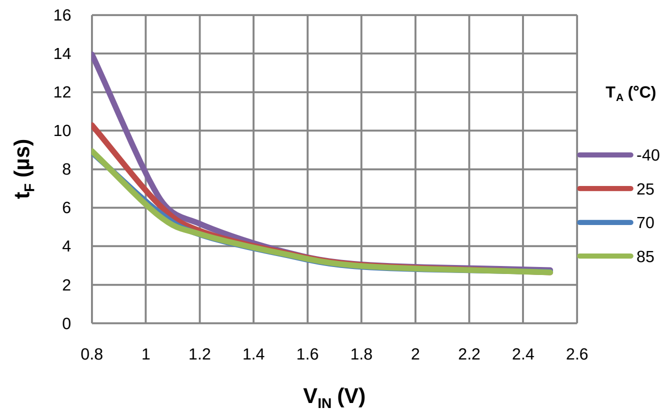


Performance Characteristics (Cont.) (@T_A = +25°C, V_{BIAS} = 5V, unless otherwise specified.)

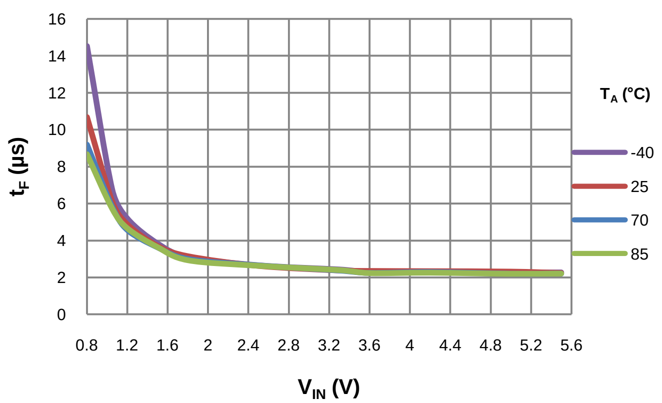
t_D vs V_{IN}, V_{BIAS}=5.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



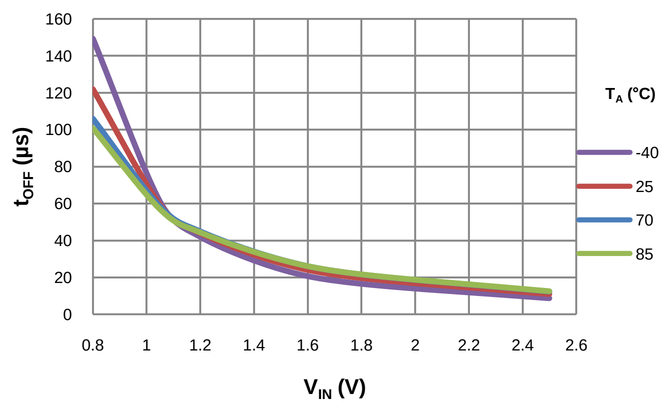
t_F vs V_{IN}, V_{BIAS}=2.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



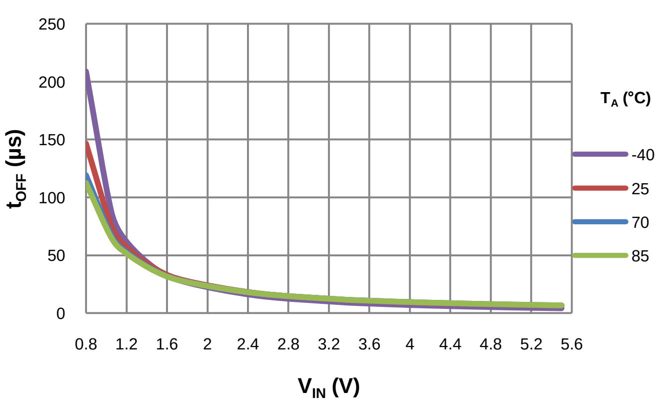
t_F vs V_{IN}, V_{BIAS}=5.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



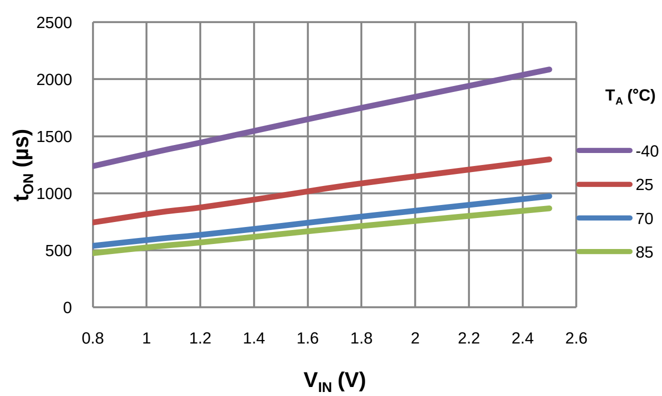
t_{OFF} vs V_{IN}, V_{BIAS}=2.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



t_{OFF} vs V_{IN}, V_{BIAS}=5.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



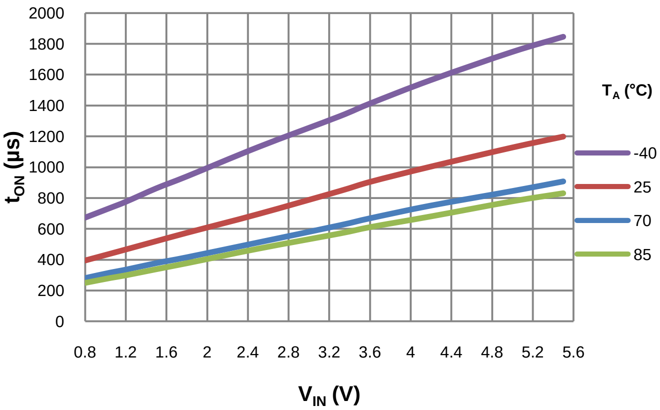
t_{ON} vs V_{IN}, V_{BIAS}=2.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



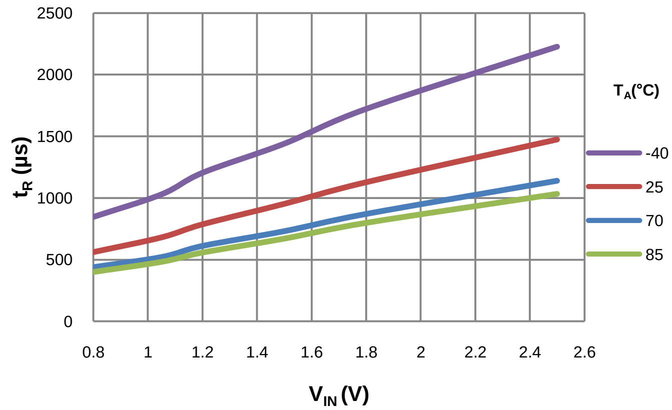
NEW PRODUCT

Performance Characteristics (Cont.) (@T_A = +25°C, V_{BIAS} = 5V, unless otherwise specified.)

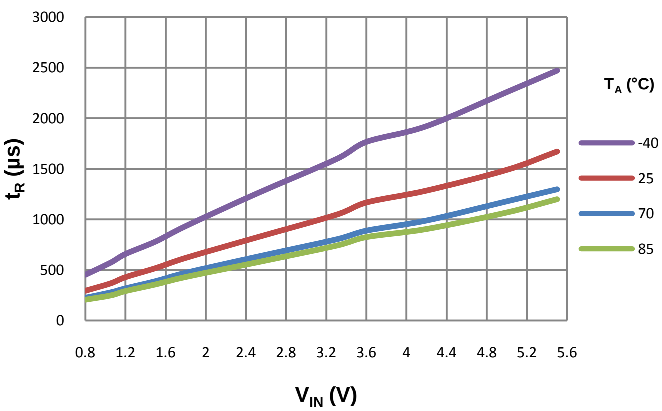
t_{ON} vs V_{IN}, V_{BIAS}=5.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



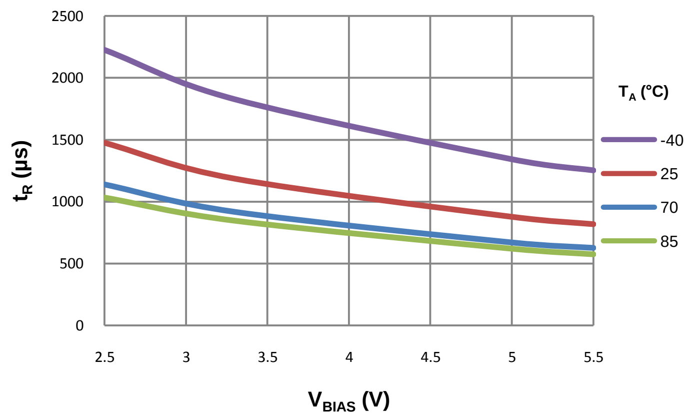
t_R vs V_{IN}, V_{BIAS}=2.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



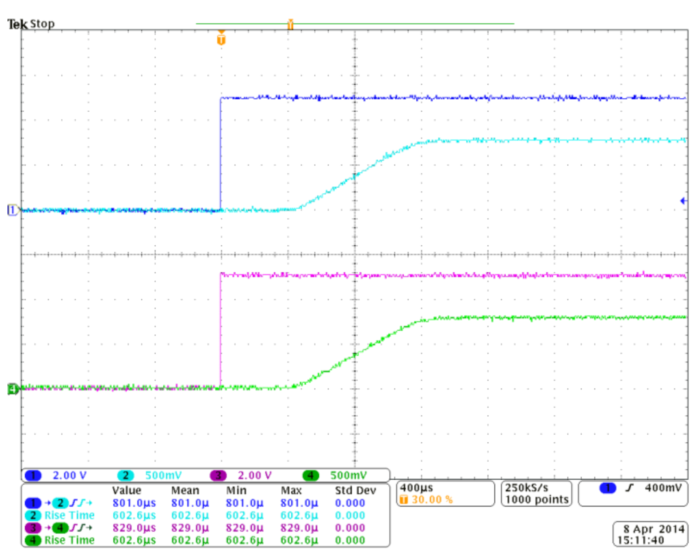
t_R vs V_{IN}, V_{BIAS}=5.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



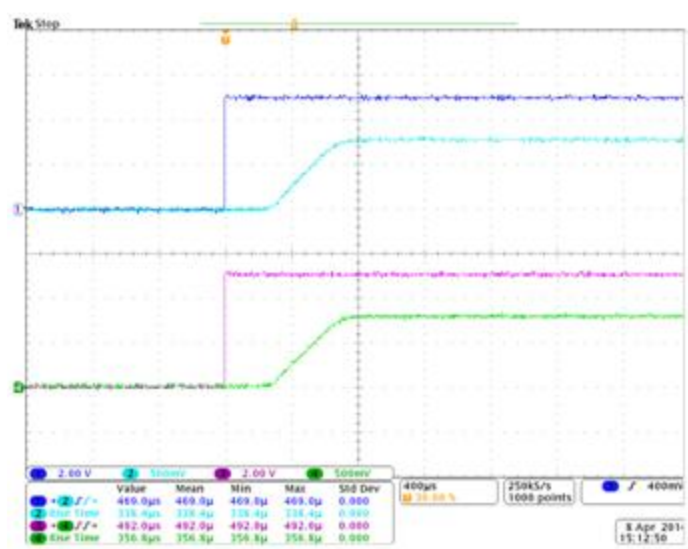
t_R vs V_{BIAS}, V_{IN}=2.5V
(C_{IN}=1µF, C_{SS}=1nF, R_L=10Ω, C_L=0.1µF)



Turn ON Response Time
V_{IN}=0.8V, V_{BIAS}=2.5V, C_{IN}=1µF, C_L=0.1µF, Css=1nF, R_L=10Ω

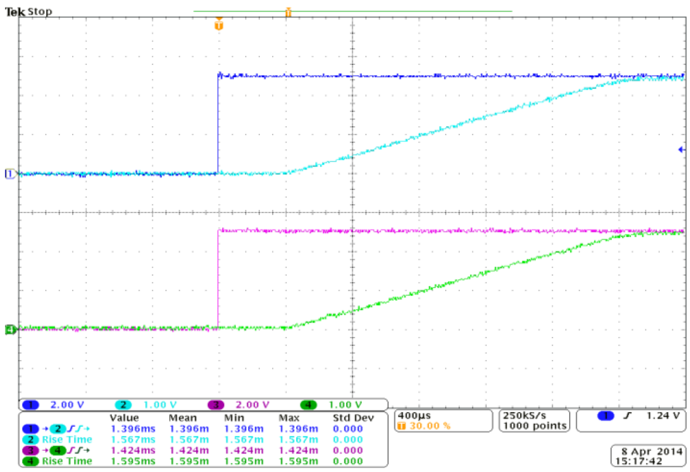


Turn ON Response Time
V_{IN}=0.8V, V_{BIAS}=5V, C_{IN}=1µF, C_L=0.1µF, Css=1nF, R_L=10Ω

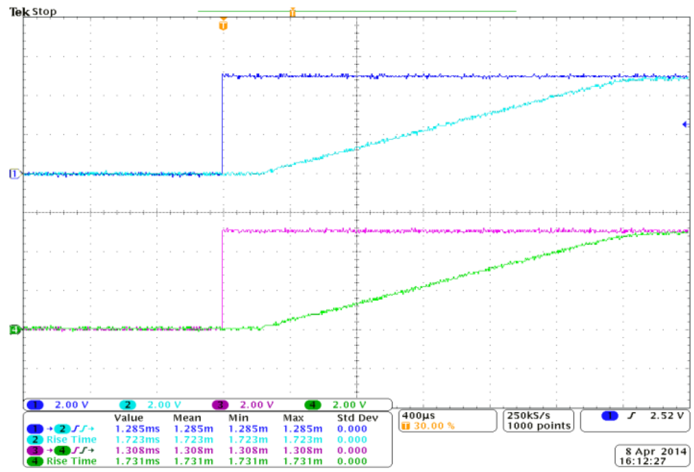


Performance Characteristics (Cont.) (@T_A = +25°C, V_{BIAS} = 5V, unless otherwise specified.)

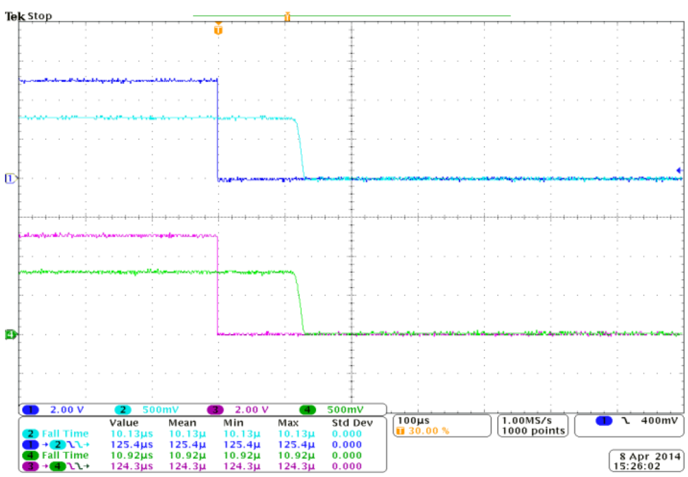
Turn ON Response Time
V_{IN}=2.5V, V_{BIAS}=2.5V, C_{IN}=1µF, C_L=0.1µF, Css=1nF, R_L=10Ω



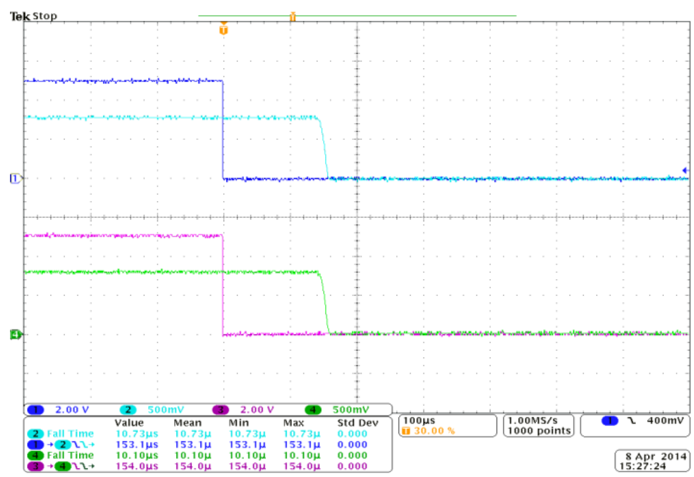
Turn ON Response Time
V_{IN}=5V, V_{BIAS}=5V, C_{IN}=1µF, C_L=0.1µF, Css=1nF, R_L=10Ω



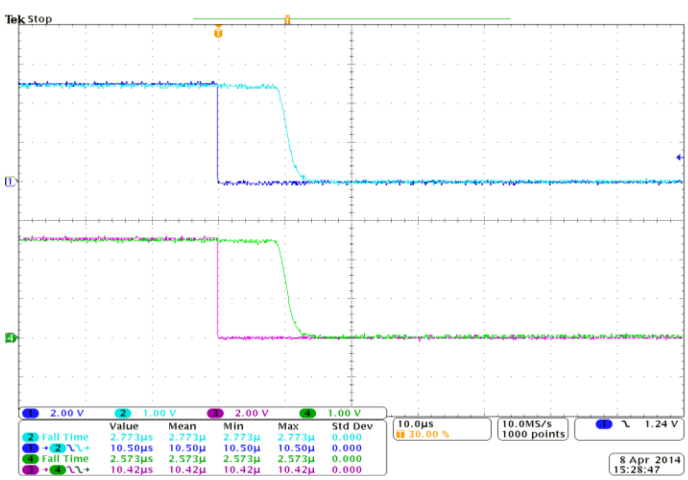
Turn OFF Response Time
V_{IN}=0.8V, V_{BIAS}=2.5V, C_{IN}=1µF, C_L=0.1µF, Css=1nF, R_L=10Ω



Turn OFF Response Time
V_{IN}=0.8V, V_{BIAS}=5V, C_{IN}=1µF, C_L=0.1µF, Css=1nF, R_L=10Ω



Turn OFF Response Time
V_{IN}=2.5V, V_{BIAS}=2.5V, C_{IN}=1µF, C_L=0.1µF, Css=1nF, R_L=10Ω



Turn OFF Response Time
V_{IN}=5V, V_{BIAS}=5V, C_{IN}=1µF, C_L=0.1µF, Css=1nF, R_L=10Ω

Application Information

Enable/Disable CONTROL

The EN pins control the state of the two switches. AP22966 is enabled when the EN pins are asserted high, and, the device is disabled when EN pins are asserted low. The EN input is compatible with both TTL and CMOS logic. This pin cannot be left floating and must be tied either high or low for proper functionality.

INPUT CAPACITOR

To limit the voltage drop on the input supply when the switch turns on into a discharged load capacitor resulting in a transient inrush current, a capacitor needs to be placed between VIN and GND. Use 1µF capacitor or a larger value for high-current applications. Place the capacitor close to the VIN pins.

OUTPUT CAPACITOR

The recommended output capacitor value is 0.1µF when switching lighter loads. For heavier loads close to 6A, it is recommended that the VIN and VOUT trace lengths be kept to a minimum. In addition, a bulk capacitor (≥ 10µF) may also be placed close to the VOUT pins. If using a bulk capacitor on VOUT, it is important to control the inrush current by choosing an appropriate soft-start time in order to minimize the droop on the input supply.

SOFT-START TIME

A capacitor on the SS pins (to GND) sets the slew rate for each channel. To ensure desired performance, a capacitor with a minimum voltage rating of 25V should be placed on the SS pins. The input inrush current can be controlled by choosing an appropriate soft-start time. The table below shows the rise-time (10% to 90%) on V_{OUT} for a variety of V_{IN} and C_{SS} conditions.

C_{SS} (pF)	Soft-start Time (µs) 10% - 90%, V_{BIAS} = 5V, C_L = 0.1µF, C_{IN} = 1µF, R_L = 10Ω, Typical Values are at T_A=+25°C						
	5V	**3.3V**	**1.8V**	**1.5V**	**1.2V**	**1.05V**	**0.8V**
0	129	93	67	61	59	57	47
220	452	310	177	148	125	112	96
470	898	610	351	290	241	210	166
1000	1609	1130	661	557	454	397	315
2200	3453	2371	1483	1224	1019	870	710
4700	7202	4978	2900	2394	2014	1728	1430
10000	13673	9774	5728	4778	3982	3370	2762

THERMAL CONSIDERATOIN

The maximum junction temperature should be restricted to +125°C under normal operating conditions. The maximum allowable power dissipation $P_{D(MAX)}$ can be calculated as:

$$P_{D(MAX)} = (T_{J(MAX)} - T_A) / \theta_{JA}$$

where,

$T_{J(MAX)}$ is the maximum operating junction temperature. For AP22966, $T_{J(MAX)}$ = +125°C

T_A is the ambient temperature of the device

θ_{JA} is the junction-to-air thermal impedance

BOARD LAYOUT

Good PCB layout is important for improving the thermal performance of the device. All trace lengths should be kept as short as possible. Place input and output capacitors close to the device to minimize the effects of parasitic inductance. The input and output PCB traces should be as wide as possible. Use a ground plane to enhance the power dissipation capability of the device.

Ordering Information

AP22966 XXX - 7

Package: DC8 : V-DFN3020-14

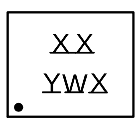
Packing: -7 : Tape & Reel

Part Number	Package Code	Packaging	7" Tape and Reel	
			Quantity	Part Number Suffix
AP22966DC8-7	DC8	V-DFN3020-14	3000/Tape & Reel	-7

Marking Information

V-DFN3020-14

(Top View)



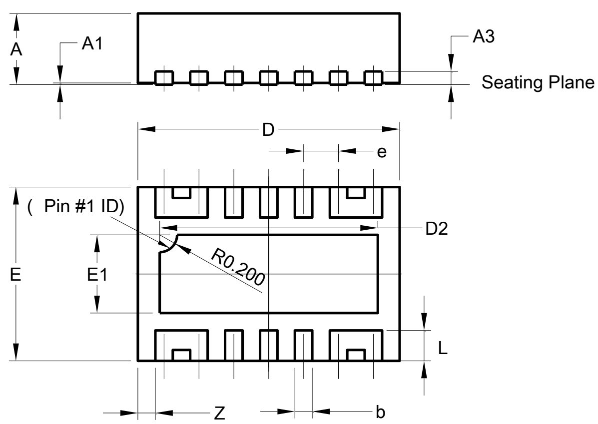
XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents
52 and 53 week
X : Internal Code

Part Number	Package	Identification Code
AP22966DC8-7	V-DFN3020-14	WE

Package Outline Dimensions

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

V-DFN3020-14

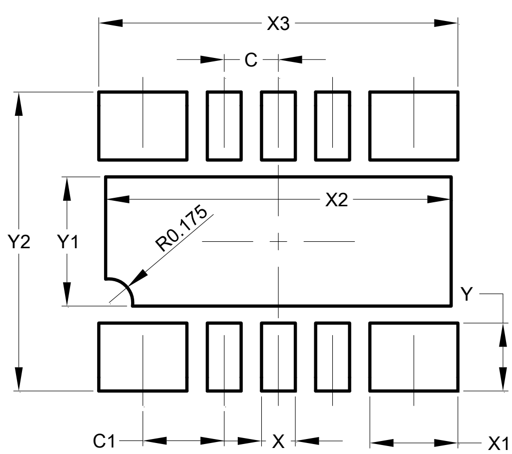


V-DFN3020-14			
Dim	**Min**	**Max**	**Typ**
A	0.77	0.83	0.80
A1	0	0.05	0.02
A3	-	-	0.15
b	0.15	0.25	0.20
D	2.95	3.05	3.00
D2	2.40	2.60	2.50
E	1.95	2.05	2.00
E1	0.80	1.00	0.90
e	-	-	0.40
L	0.30	0.40	0.35
Z	-	-	0.20
All Dimensions in mm			

Suggested Pad Layout

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

V-DFN3020-14



Dimensions	Value (in mm)
C	0.400
C1	0.600
X	0.250
X1	0.650
X2	2.550
X3	2.650
Y	0.500
Y1	0.950
Y2	2.200