

1 Efficiency

The efficiency was measured without dimming and by selecting the three different output currents: 50mA, 150mA, 300mA. The load was built by 12 LED in series.

Iout (mA)	Vout (V)	Pout (W)	Iin (mA)	Vin (V)	Pin (W)	Ploss (W)	Eff
49.0	33.91	1.66	117.1	20	2.342	0.68	70.9%
145.8	36.5	5.32	329.0	20	6.58	1.26	80.9%
288.2	37.56	10.82	644.3	20	12.89	2.06	84.0%

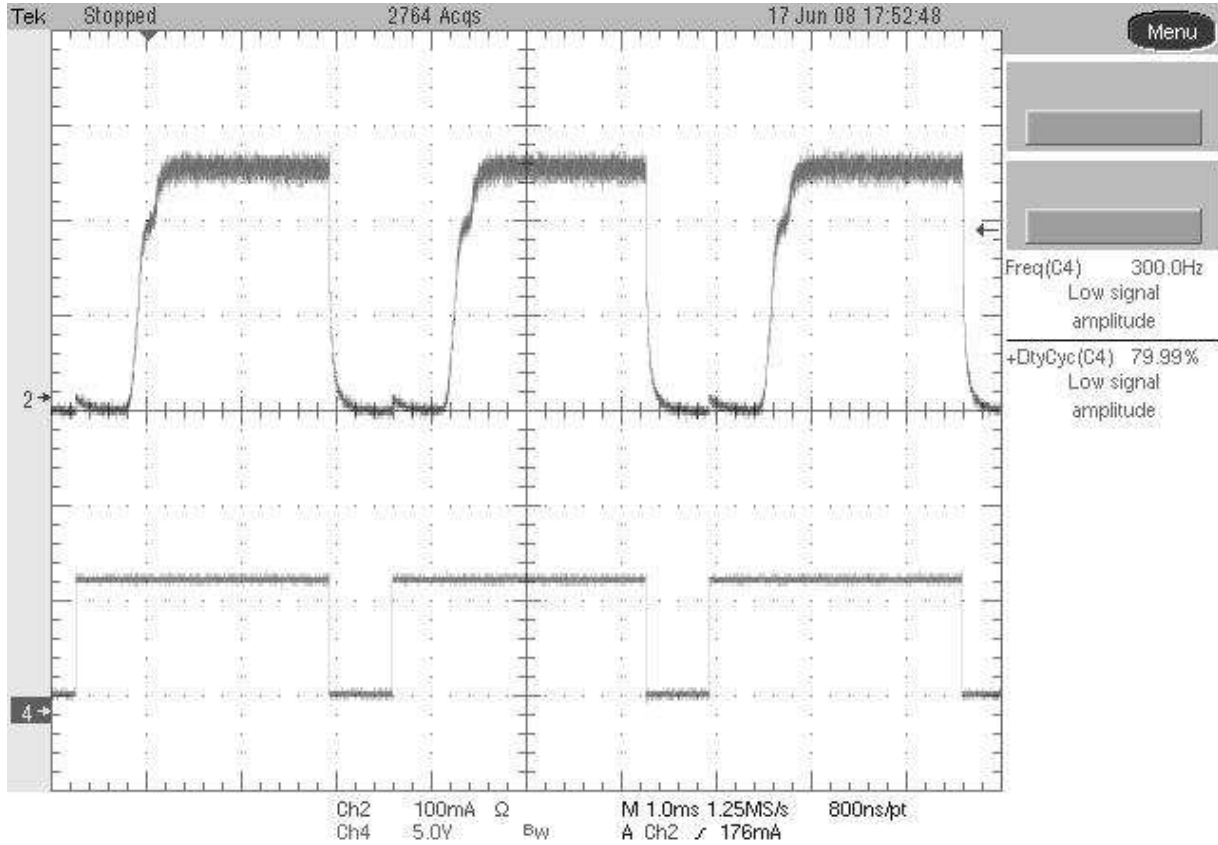
Iout (mA)	Vout (V)	Pout (W)	Iin (mA)	Vin (V)	Pin (W)	Ploss (W)	Eff
49.0	33.9	1.66	82.7	35	2.8945	1.23	57.4%
146.0	36.18	5.28	205.2	35	7.18	1.90	73.5%
286.4	37.55	10.75	385.2	35	13.48	2.73	79.8%

Iout (mA)	Vout (V)	Pout (W)	Iin (mA)	Vin (V)	Pin (W)	Ploss (W)	Eff
48.5	33.79	1.64	73.7	50	3.685	2.04	44.5%
146.4	35.76	5.24	158.5	50	7.93	2.69	66.1%
286.9	37.56	10.78	291.6	50	14.58	3.80	73.9%

2 Load Dimming

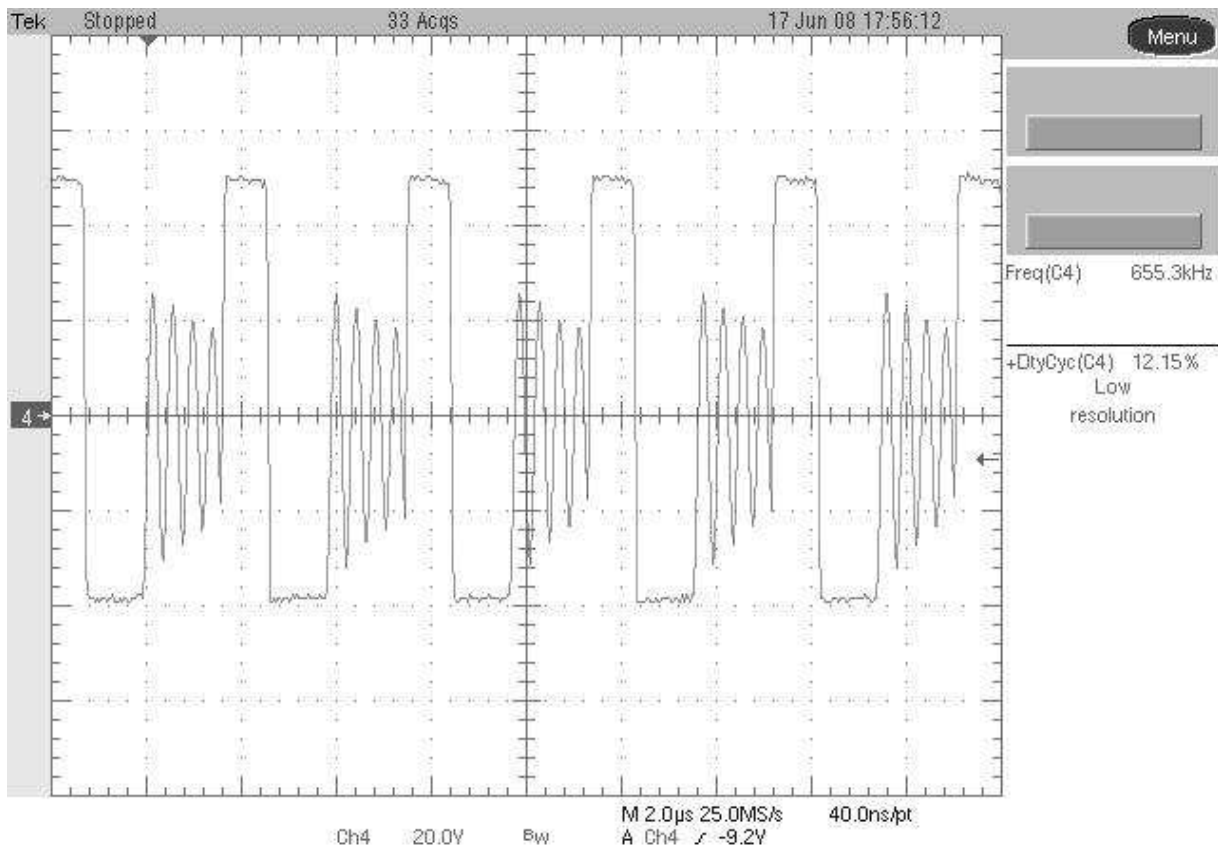
The image below shows the response to 300Hz 80% duty cycle PWM. The input voltage was set 20V and the load at 260mApeak.

Channel 2: LED current 100 mA/div, Channel 4: Control Voltage 5V/div.



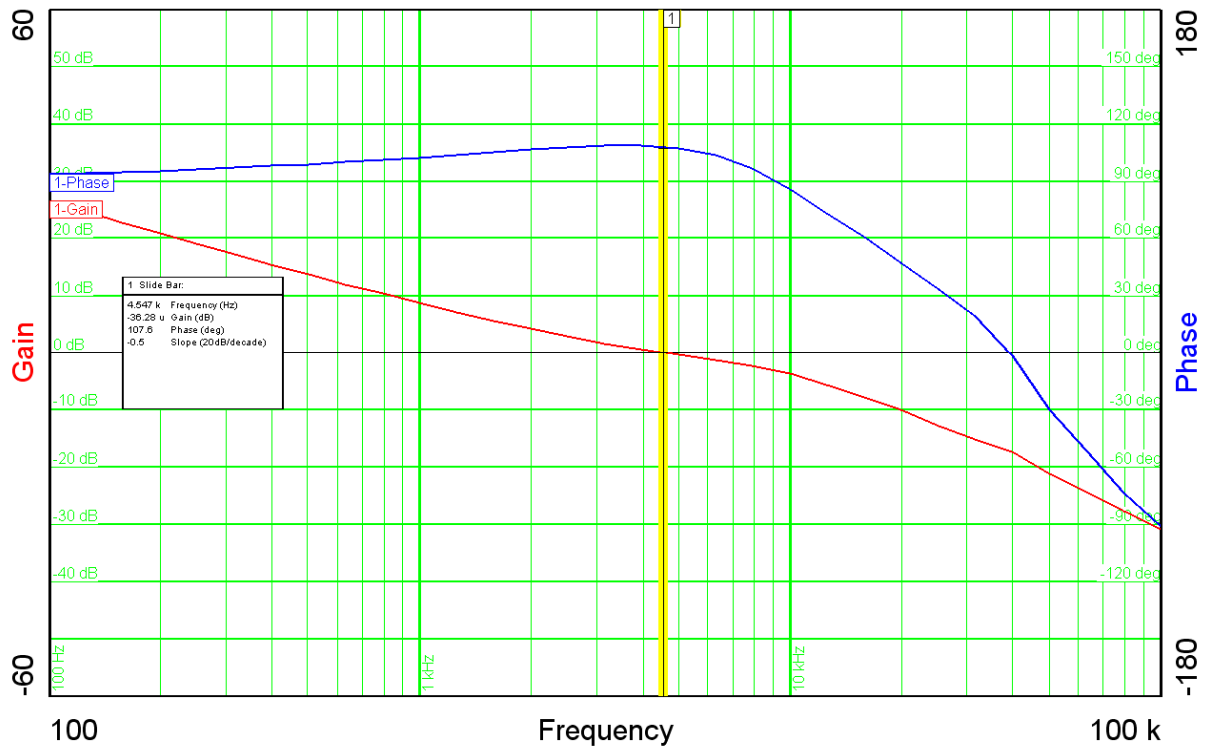
3 Switching Node Waveform

The image below shows the voltage on the drain of the switching node (Q1). Input voltage was set to 50Vdc, output load was set at 300mA, 37V.

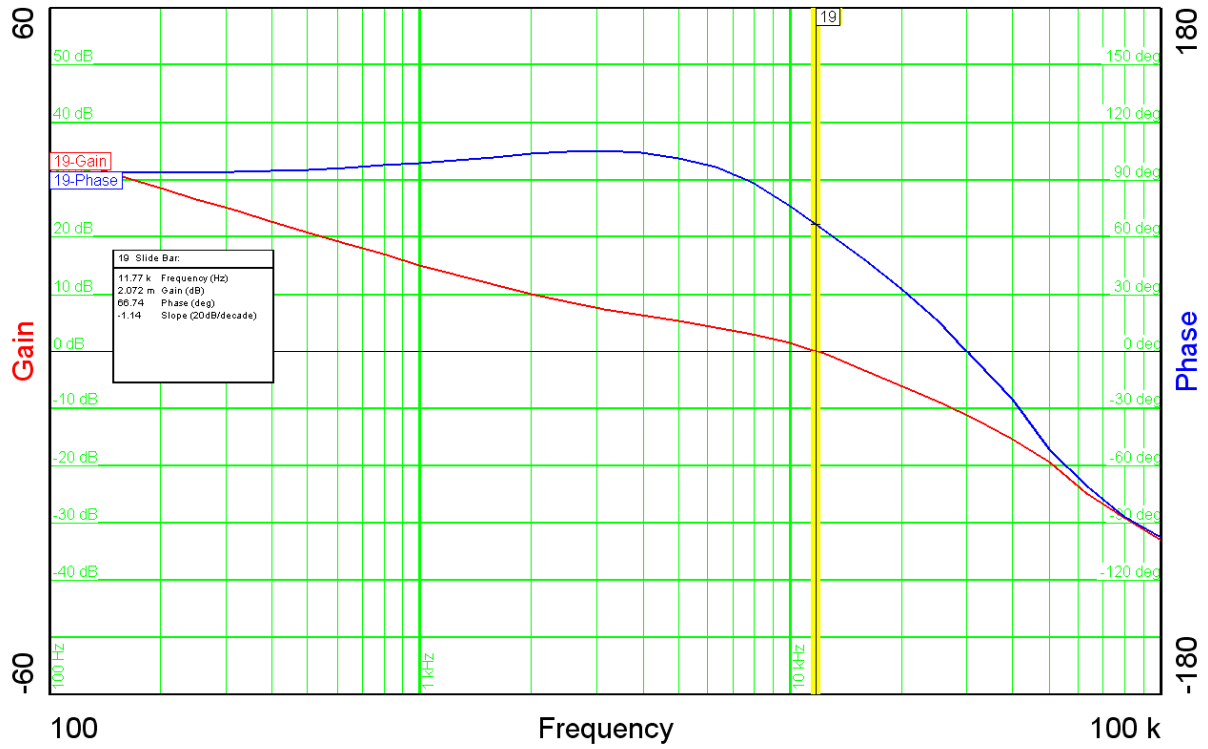


4 Loop Response

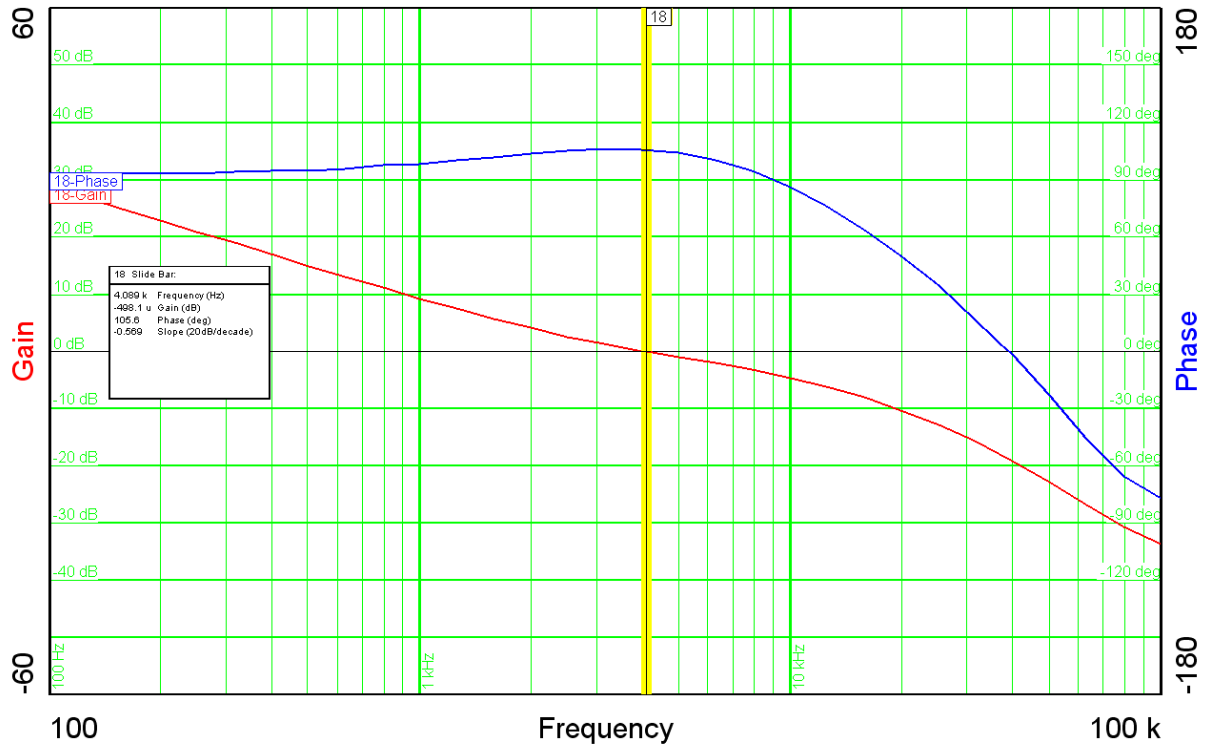
The image below shows the loop response of the converter measured with a 20Vdc input; output load was set at 300mA 37Vdc. Phase margin is 107 deg. and crossover frequency is 4.547 KHz.



The image below shows the loop response of the converter measured with a 30Vdc input; output load was set at 300mA 37Vdc. Phase margin is 66.74 deg. and crossover frequency is 11.77KHz.



The image below shows the loop response of the converter measured with a 50Vdc input; output load was set at 300mA 37Vdc. Phase margin is 105.6 deg. and crossover frequency is 4.089KHz.



IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATA SHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.

TI objects to and rejects any additional or different terms you may have proposed.

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2021, Texas Instruments Incorporated