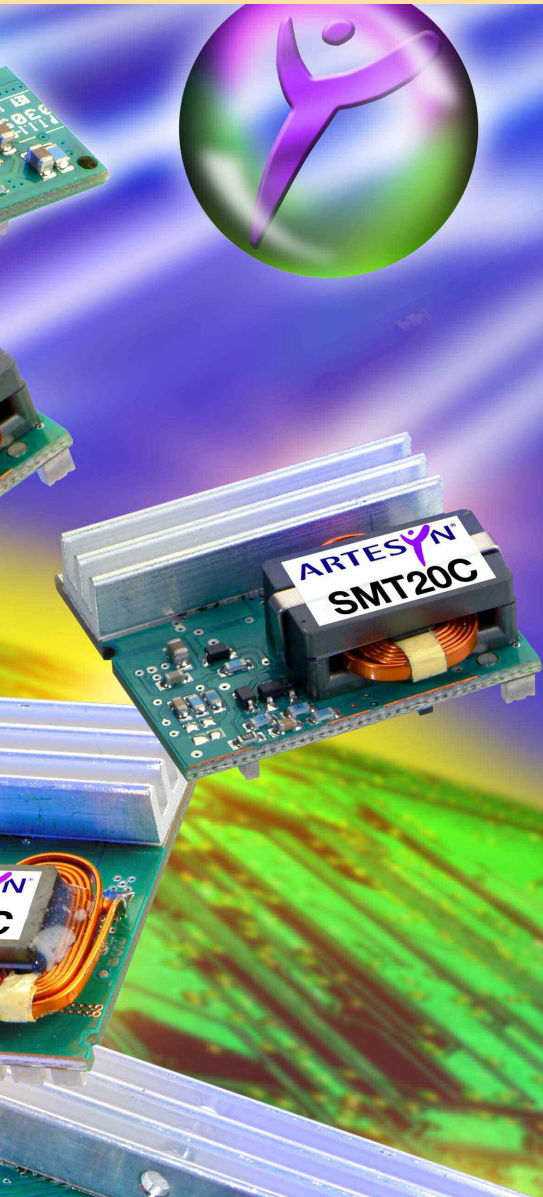


SMT20C SERIES

Single Output



Wide output voltage trim (0.9 Vdc to 5.0 Vdc, 20 A max.)

Power good output signal (open collector)

Input undervoltage lockout

Current sink capability for termination applications

Operating ambient temperature up to 80 °C with suitable derating and forced air cooling

Remote ON/OFF

No minimum load requirements

Non-latching overcurrent protection

5 V and 12 V input options

Available RoHS compliant

The SMT20C is a new high density open frame non-isolated converter series for space-sensitive applications. Each model has a wide input range (4.5 Vdc to 5.5 Vdc or 10.2 Vdc to 13.8 Vdc) and offer a wide 0.9 Vdc to 3.3/5 Vdc output voltage range with a 20 A load. An external resistor adjusts the output voltage from its pre-set value of 0.9 V to any value up to the maximum allowed value for that model. Typical efficiencies are 87% for the 5 V input version and 91% for the 12 V input version at full load conditions.

The SMT20C series offers remote ON/OFF and overcurrent protection as standard. With full international safety approval including EN60950 and UL/cUL60950, the SMT20C reduces compliance costs and time to market.

[2 YEAR WARRANTY]



Stresses in excess of the maximum ratings can cause permanent damage to the device. Operation of the device is not implied at these or any other conditions in excess of those given in the specification. Exposure to absolute maximum ratings can adversely affect device reliability.

Absolute Maximum Ratings

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input voltage - continuous	$V_{in} (cont)$	-0.3		13.8	V DC	$V_{in(+)} - V_{in(-)}$
Operating temperature	T_{op}	0		50	°C	Measured at thermal reference points, see Note 1. Higher ambient operation possible with forced air cooling. See de-rating curves
Storage temperature	$T_{storage}$	-40		125	°C	
Output current	$I_{out} (max)$			20	A	

All specifications are typical at nominal input $V_{in} = 5V$ and $12V$, full load under any resistive load combination at $25^{\circ}C$ unless otherwise stated.

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input voltage (5V)	V_{in}	4.5	5.0	5.5	V DC	
(12V)	V_{in}	10.2	12.0	13.8	V DC	
Input current - no load (5V)	I_{in}		65		mADC	$V_{in} (min) - V_{in} (max)$, enabled
(12V)			65			
Input current - Quiescent (5V)	I_{in}		10	20	mADC	Converter disabled
(12V)			3.5	6.5		
Input voltage variation	dv/dt		1.2		V/ms	Product was tested at 1.2V/ms. Much higher dv/dt is possible (>10V/ms).

Turn On/Off

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input voltage - turn on (5V)	$V_{in} (on)$	4.4	4.5	4.6	V DC	
(12V)	$V_{in} (on)$	9.0	9.3	9.6	V DC	
Input voltage - turn off (5V)	$V_{in} (off)$	4.2	4.3	4.4	V DC	
(12V)	$V_{in} (off)$	7.5	7.8	8.1	V DC	
Turn on delay - enabled, then power applied	$T_{delay} (power)$			20	msec	With the Remote ON/OFF signal asserted, this is the time from when the input voltage reaches the minimum specified operating voltage until the Power Good is asserted high
Turn on delay - power applied, then Remote ON/OFF asserted	$T_{delay} (Remote ON/OFF)$			20	msec	$V_{in} = V_{in} (nom)$, then Remote ON/OFF asserted. This is the time taken until the power good is asserted high.
Output to power good delay	$T_{delay} (power good)$			8	ms	Output voltage in full regulation to power good asserted high.
Rise time (5V)	T_{rise}			10	msec	From 10% to 90%; full resistive load, 680 μ F capacitance

Signal Electrical Interface

Characteristic - Signal Name	Symbol	Min	Typ	Max	Units	Notes and Conditions
At remote/control ON/OFF pin						See Notes 2 and 3 See Application Note 169 for Remote ON/OFF details
Control pin open circuit voltage	V_{ih}		2.27	2.5	V	$I_{ih} = 0 \mu\text{A}$; open circuit voltage
High level input current	I_{ih}			1.0	μA	Current flowing into control pin when pin is pulled high (max. at $V_{ih} = 13.8\text{V}$)
High level input voltage	V_{ih}	2.4			V	Converter guaranteed on when control pin is greater than $V_{ih}(\text{min})$
Low level input voltage	V_{il}			0.8	V	Converter guaranteed off when control pin is less than $V_{il}(\text{max})$
Low level input current (5V)	$I_{il}(\text{max})$			0.50	mA	$V_{il} = 0.0\text{V}$;
(12V)				0.13	mA	

Reliability and Service Life

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Mean time between failure (5V) (12V)	MTBF	168,281 167,868			Hours	MIL-HDBK-217F, $V_{in} = V_{in}(\text{nom})$; $I_{out} = I_{out}(\text{max})$; ambient 25°C; ground benign environment
Mean time between failure (5V) (12V)	MTBF	8,857,111 7,963,574			Hours	Telcordia SR-332 Issue 3, ground benign, temp. = 40°C, $V_{in} = V_{in}(\text{nom})$, $I_{out} = I_{out}(\text{max})$

Other Specifications

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Switching frequency	F_{sw}		275		kHz	Fixed frequency
Weight			14.2		g	

Safety Agency Approvals

Characteristic	
UL/cUL 60950 File No.	E139421
TÜV Product Service IEC 60950	Certificate No. B 04 08 19870 228

Material Ratings

Characteristic - Signal Name	Notes and Conditions
Flammability rating	UL94V-0
Material type	FR4 PCB

Model Numbers

Model Number	Input Voltage	Output Voltage	Output Current (Max.)	Efficiency at Full Load	Max. Load Regulation
SMT20C-05SADJJ	4.5V - 5.5V	0.9V - 3.3V	20A	87%	±1.3%
SMT20C-12SADJJ	10.2V - 13.8	0.9V - 5.0V	20A	91%	±1.3%

RoHS Compliance Ordering Information



The 'J' at the end of the part number indicates that the part is Pb-free (RoHS 6/6 compliant). TSE RoHS 5/6 (non Pb-free) compliant versions may be available on special request, please contact your local sales representative for details.

5V and 12V Model 0.9V Setpoint

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating						
(Source) (5V)	I_{in}		5.27		A DC	$V_{in} = V_{in} (nom); I_{out} = I_{out} (max);$
(Sink) (5V)	I_{in}		-2.00		A DC	
(Source) (12V)	I_{in}		2.15		A DC	$V_{in} = V_{in} (nom); I_{out} = I_{out} (max);$
(Sink) (12V)	I_{in}		-0.97		A DC	
Reflected ripple current						
(5V)	$I_{in} (ripple)$		50		mA RMS	$I_{out} = I_{out} (max);$ measured with external filter. See Application Note 169 for details
(5V)			200		mA pk-pk	
(12V)			25		mA RMS	
(12V)			100		mA pk-pk	
Input capacitance - internal filter	C_{input}		4.70		μF	
Input capacitance - external input	C_{bypass}		540		μF	Recommended customer added capacitance. Maximum ESR = 20m Ω . See Application Note 169 for ripple current requirements

5V and 12V Model 0.9V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	$V_o (nom)$	0.878	0.9	0.923	V DC	$V_{in} = V_{in} (nom); I_{out} = I_{out} (NL)$
Line regulation				± 0.2	%	$V_{in} (min)$ to $V_{in} (max)$
Load regulation				± 1.3	%	$V_{in} = V_{in} (nom);$ Output current
Output current continuous	I_{out}	0		± 20	A DC	Minus indicates Sink Mode
Output current - short circuit	I_{sc}		4.0		A rms	Continuous, unit auto recovers
Output voltage - noise						
(5V) 0.9V	V_{p-p}		18.0	30	mV pk-pk	Measurement bandwidth 20MHz See Application Note 169 for
	V_{rms}		3.6	15	mV rms	
(12V) 0.9V	V_{p-p}		28.6	50	mV pk-pk	
	V_{rms}		5.3	25	mV rms	

5V and 12V Model 0.9V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		100	200	mV	Peak deviation for 50% to 75% step load, $di/dt = 10A/\mu sec$
Load transient response - recovery	$T_{recovery}$		200		μsec	Settling time to within 1% of output set point voltage for 50% to 75% step load
External load capacitance (5V) (12V)	C_{ext}		680	17,600 11,000	μF	Max ESR = 12m Ω See Application Note 169 for output capacitance values vs. stability

5V and 12V Model 0.9V Setpoint

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overcurrent limit inception (5V) (12V)	I_{oc} I_{oc}		26 26		A DC A DC	

5V and 12V Model 0.9V Setpoint

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency 5V (source mode) 5V (sink mode)	η	65.6 52.7	67.6 54.7		%	$I_{out} = 100\% I_{out} (max)$, $V_{in} = V_{in} (nom)$
Efficiency 12V (source mode) 12V (sink mode)	η	66.8 61.4	68.8 63.4		%	
Efficiency 5V (source mode) 5V (sink mode)	η	76.0 68.3	78.0 70.3		%	$I_{out} = 50\% I_{out} (max)$, $V_{in} = V_{in} (nom)$
Efficiency 12V (source mode) 12V (sink mode)	η	74.1 72.5	76.1 74.5		%	

5V Model 1.8V Setpoint

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating (source) (sink)	I_{in}		8.9		A DC	$V_{in} = V_{in} (nom)$; $I_{out} = I_{out} (max)$;
	I_{in}		-5.5		A DC	
Reflected ripple current	$I_{in} (ripple)$		50		mA RMS	$I_{out} = I_{out} (max)$; measured with external filter. See Application Note 169 for details
			200		mA pk-pk	
Input capacitance - internal filter	C_{input}		4.70		μF	
Input capacitance - external bypass	C_{bypass}		540		μF	Recommended customer added capacitance. Max ESR = 20m Ω See Application Note 169 for ripple current requirements

5V Model 1.8V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	$V_o (nom)$	1.755	1.80	1.845	V DC	$V_{in} = V_{in} (nom)$; $I_{out} = I_{out} (max)$
Line regulation				± 0.2	%	$V_{in} (min)$ to $V_{in} (max)$
Load regulation				± 1.0	%	$V_{in} = V_{in} (nom)$;
Output current continuous	I_{out}	0		± 20	A DC	Minus indicates sink mode
Output current - short circuit	I_{sc}		4.0		A rms	Continuous, unit auto recovers from short, $V_o < 100mV$
Output voltage - noise	V_{p-p}		18.8	30	mV pk-pk	Measurement bandwidth 20MHz See Application Note 169 for measurement set-up details
	V_{rms}		4.2	15	mV rms	

5V Model 1.8V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		100		mV	Peak deviation for 50% to 75% step load, $di/dt = 10A/\mu sec$
Load transient response - recovery	$T_{recovery}$		200		μsec	Settling time to within 1% of output set point voltage for 50% to 75% step load
External load capacitance	C_{ext}		680	16,400	μF	Max ESR = 12m Ω See Application Note 169 for output capacitance values vs. stability

5V Model 1.8V Setpoint

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overcurrent limit inception	I_{OC}		26		A DC	

5V Model 1.8V Setpoint

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency (source) (sink)	η	78.0 73.1	80.0 75.1		%	$I_{out} = I_{out} (max)$, $V_{in} = V_{in} (nom)$
Efficiency (source) (sink)	η	85.5 82.7	87.5 84.7		%	$I_{out} = 50\% I_{out} (max)$, $V_{in} = V_{in} (nom)$

5V Model 3.3V Setpoint

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating (source)	I_{in}		15.11		A DC	$V_{in} = V_{in} (nom)$; $I_{out} = I_{out} (max)$
Reflected ripple current	$I_{in} (ripple)$		50 200		mA RMS mA pk-pk	$I_{out} = I_{out} (max.)$, measured with external filter. See Application Note 169 for details
Input capacitance - internal filter	C_{input}		4.7		μF	
Input capacitance - external bypass	C_{bypass}		540		μF	Recommended customer added capacitance. Max ESR = 20m Ω See Application Note 169 for ripple current requirements

5V Model 3.3V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	$V_o (nom)$	3.22	3.30	3.38	V DC	$V_{in} = V_{in} (nom)$; $I_{out} = I_{out} (NL)$
Line regulation				± 0.2	%	$V_{in} (min)$ to $V_{in} (max)$
Load regulation				± 0.5	%	$V_{in} = V_{in} (nom)$;
Output current continuous	I_{out}	0		± 20	A DC	Minus indicates sink mode
Output current - short circuit	I_{sc}		4.0		A rms	Continuous, unit auto recovers from short, $V_o < 100mV$
Output voltage - noise	V_{p-p}		18.0	40	mV pk-pk	Measurement bandwidth 20MHz
	V_{rms}		3.3	15	mV rms	See Application Note 169 for measurement set-up details

5V Model 3.3V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		75		mV	Peak deviation for 50% to 75% step load, $di/dt = 10A/\mu sec$
Load transient response - recovery	$T_{recovery}$		200		μsec	Settling time to within 1% of output set point voltage for 50% to 75% step load
External load capacitance	C_{ext}		680	13,200	μF	Max ESR = 12m Ω See Application Note 169 for output capacitance values vs. stability

5V Model 3.3V Setpoint

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overcurrent limit inception	I_{oc}		26		A DC	

5V Model 3.3V Setpoint

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency (source)	η	85.1	87.1		%	$I_{out} = I_{out} (max)$
Efficiency (source)	η	90.3	92.3		%	$I_{out} = 50\% I_{out} (max)$

12V Model 2.5V Setpoint

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating (source)	I_{in}		4.84		A DC	$V_{in} = V_{in} (nom)$; $I_{out} = I_{out} (max)$
(sink)	I_{in}		-3.44		A DC	
Reflected ripple current	$I_{in} (ripple)$		45 170		mA RMS mA pk-pk	$I_{out} = I_{out} (max)$; measured with external filter. See Application Note 169 for details
Input capacitance - internal filter	C_{input}		4.70		μF	
Input capacitance - external bypass	C_{bypass}		540		μF	Recommended customer added capacitance. Max ESR = 20m Ω See Application Note 169 for ripple current requirements

12V Model 2.5V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	$V_o (nom)$	2.43	2.50	2.56	V DC	$V_{in} = V_{in} (nom)$; $I_{out} = I_{out} (NL)$
Line regulation				± 0.2	%	$V_{in} (min)$ to $V_{in} (max)$
Load regulation				± 1	%	$V_{in} = V_{in} (nom)$
Output current continuous	I_{out}	0		± 20	A DC	Minus indicates sink mode
Output current - short circuit	I_{sc}		4.0		A rms	Continuous, unit auto recovers from short, $V_o < 100mV$
Output voltage - noise	V_{p-p} V_{rms}		38.0 8.6	50 25	mV pk-pk mV rms	Measurement bandwidth 20MHz See Application Note 169 for measurement set-up details

12V Model 2.5V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		75		mV	Peak deviation for 50% to 75% step load, $di/dt = 10A/\mu sec$
Load transient response - recovery	$T_{recovery}$		200		μsec	Settling time to within 1% of output set point voltage for 50% to 75% step load
External load capacitance	C_{ext}		680	7840	μF	Max ESR = 12m Ω See Application Note 169 for output capacitance values vs. stability

12V Model 2.5V Setpoint

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overcurrent limit inception	I_{OC}		26		A DC	

12V Model 2.5V Setpoint

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency (source) (sink)	η	82.0 79.2	85.2 81.2		%	$I_{out} = I_{out} (max)$, $V_{in} = V_{in} (nom)$
Efficiency (source) (sink)	η	87.1 85.0	89.1 87.0		%	$I_{out} = 50\% I_{out} (max)$, $V_{in} = V_{in} (nom)$

12V Model 5V Setpoint

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		9.03		A DC	$V_{in} = V_{in} (nom)$; $I_{out} = I_{out} (max)$
Reflected ripple current	$I_{in} (ripple)$		50 180		mA RMS mA pk-pk	$I_{out} = I_{out} (max)$; measured with external filter. See Application Note 169 for details
Input capacitance - internal filter	C_{input}		4.70		μF	
Input capacitance - external bypass	C_{bypass}		540		μF	Recommended customer added capacitance. Max ESR = 20m Ω See Application Note 169 for ripple current requirements

12V Model 5V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	$V_o (nom)$	4.88	5.00	5.13	V DC	$V_{in} = V_{in} (nom)$; $I_{out} = I_{out} (NL)$
Line regulation				± 0.2	%	$V_{in} (min)$ to $V_{in} (max)$
Load regulation				± 0.7	%	$V_{in} = V_{in} (nom)$
Output current continuous	I_{out}	0		± 20	A DC	Minus indicates sink mode
Output current - short circuit	I_{sc}		4.0		A rms	Continuous, unit auto recovers from short, $V_o < 100mV$
Output voltage - noise	V_{p-p} V_{rms}		44.0 10.6	50 25	mV pk-pk mV rms	Measurement bandwidth 20MHz See Application Note 169 for measurement set-up details

12V Model 5V Setpoint

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		70		mV	Peak deviation for 50% to 75% step load, $di/dt = 10A/\mu sec$
Load transient response - recovery	$T_{recovery}$		200		μsec	Settling time to within 1% of output set point voltage for 50% to 75% step load
External load capacitance	C_{ext}		680	5080	μF	Max ESR = 12m Ω See Application Note 169 for output capacitance values vs. stability

12V Model 5V Setpoint

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overcurrent limit inception	I_{oc}		26		A DC	

12V Model 5V Setpoint

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency (source)	η	89.1	91.1		%	$I_{out} = I_{out} (max)$
Efficiency (source)	η	91.6	93.6		%	$I_{out} = 50\% I_{out} (max)$

5V Model 0.9V Setpoint

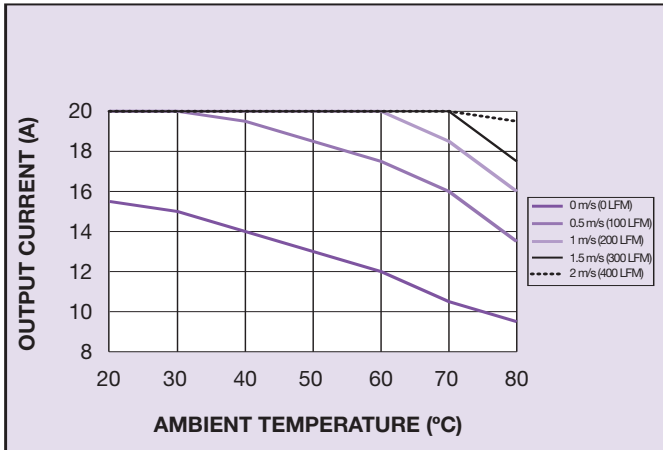


Figure 1: Thermal De-rating Curve

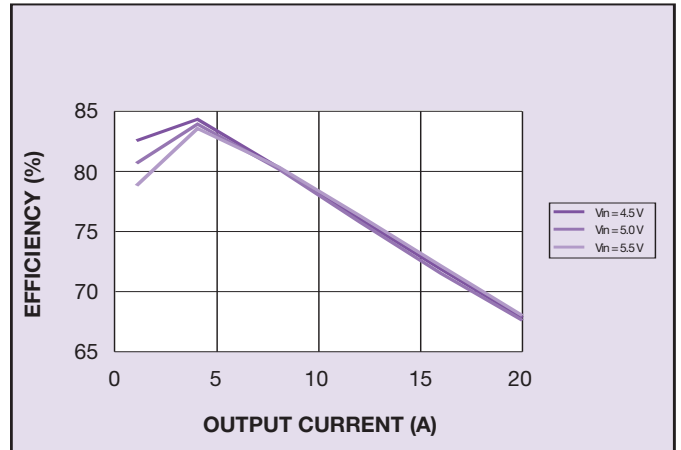


Figure 2: Efficiency when Sourcing

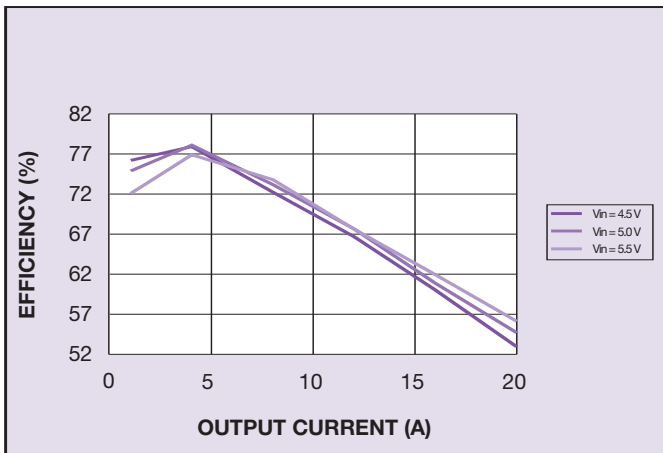


Figure 3: Efficiency when Sinking

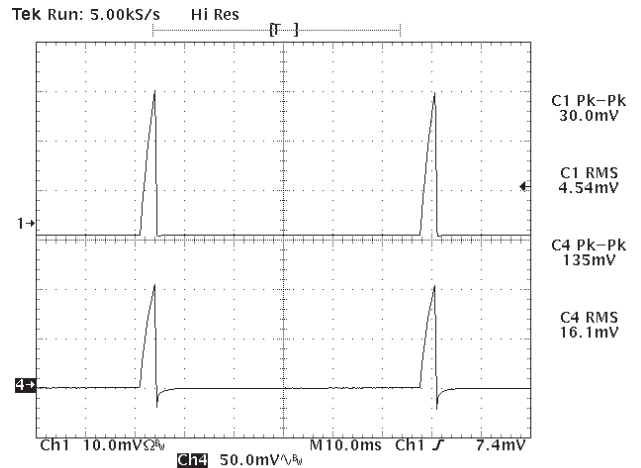


Figure 4: Short Circuit Characteristic (Channel 1: Output Current at 10A/div, Channel 4: Output Voltage)

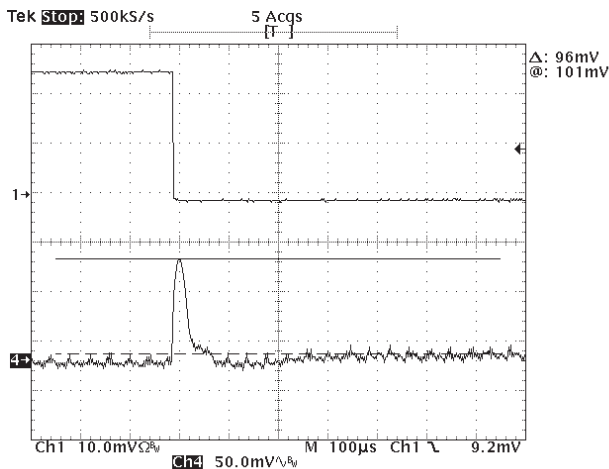


Figure 5: Transient Response 75-50% (Sinking) (Channel 1: Current Load Step at 2A/div, 4: Output Voltage Deviation)

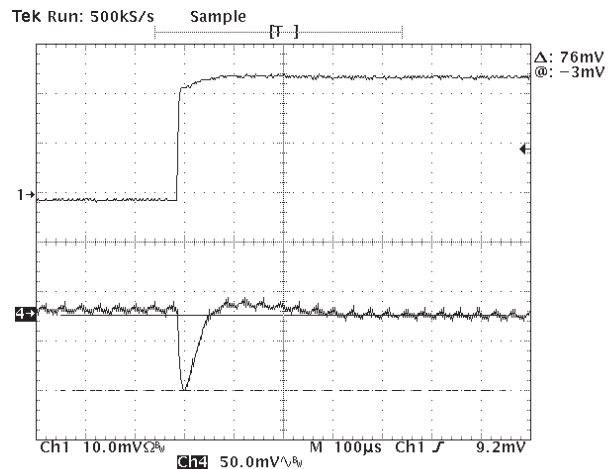


Figure 6: Transient Response 50-75% (Sourcing) (Channel 1: Current Load Step at 2A/div, 4: Output Voltage Deviation)

5V Model 0.9V Setpoint

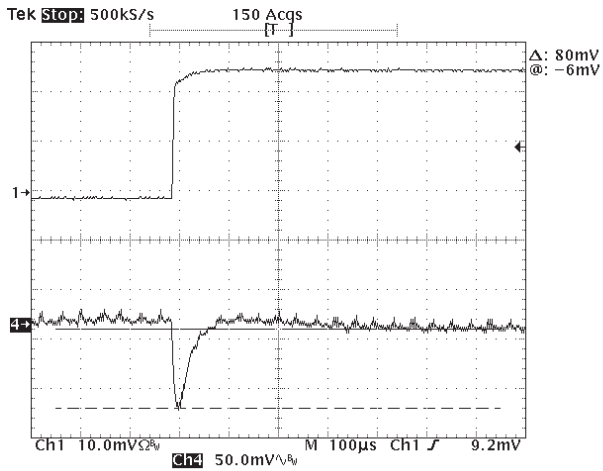


Figure 7: Transient Response 50 - 75% (Sinking)
(Channel 1: Current Load Step at 2A/div
4: Output Voltage Deviation)

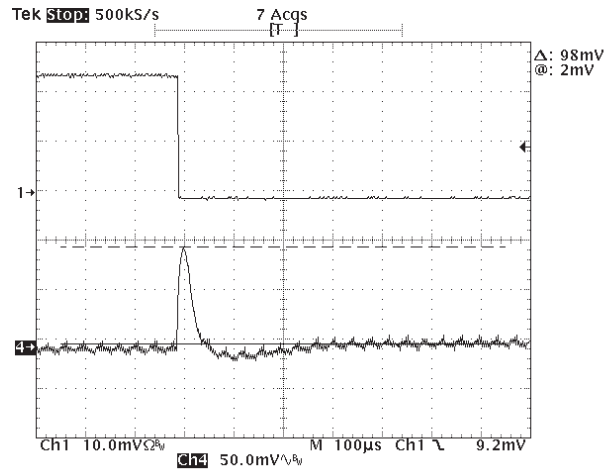


Figure 8: Transient Response 75 - 50% (Sourcing)
(Channel 1: Current Load Step at 2A/div
4: Output Voltage Deviation)

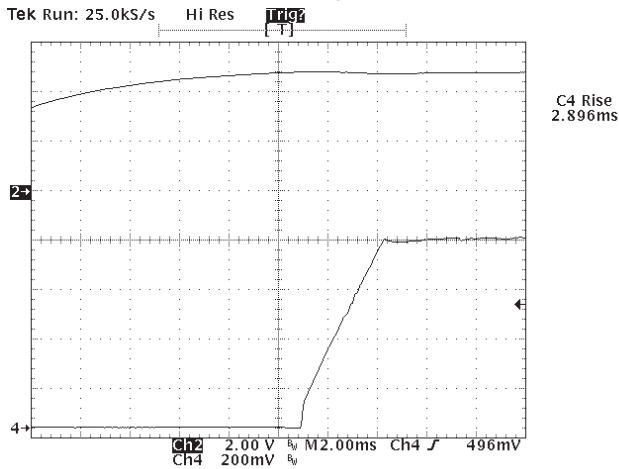


Figure 9: Typical Power Up
(Channel 2: DC Input, Channel 4: Output Voltage)

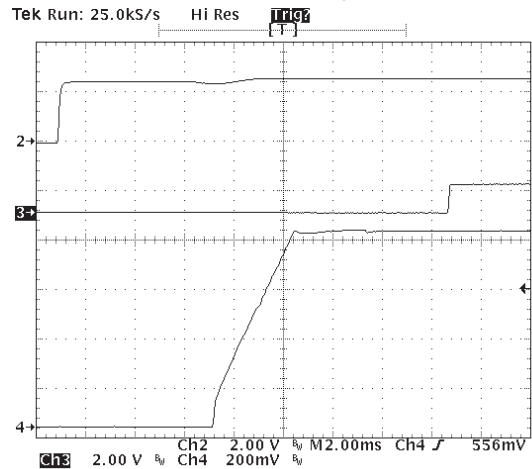


Figure 10: Control On/Off
(Channel 2: Remote ON/OFF, Channel 3: Power Good,
Channel 4: Output Voltage)

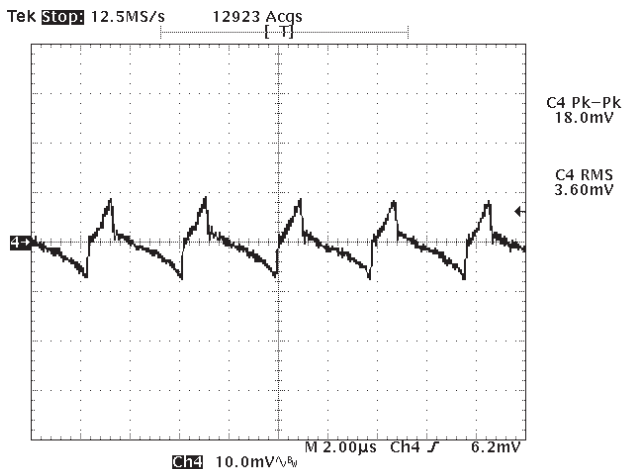


Figure 11: Typical Ripple and Noise

5V Model 1.8V Setpoint

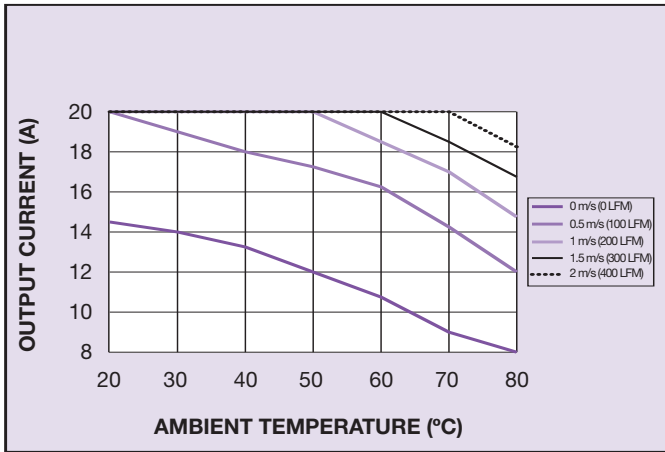


Figure 12: Thermal De-rating Curve

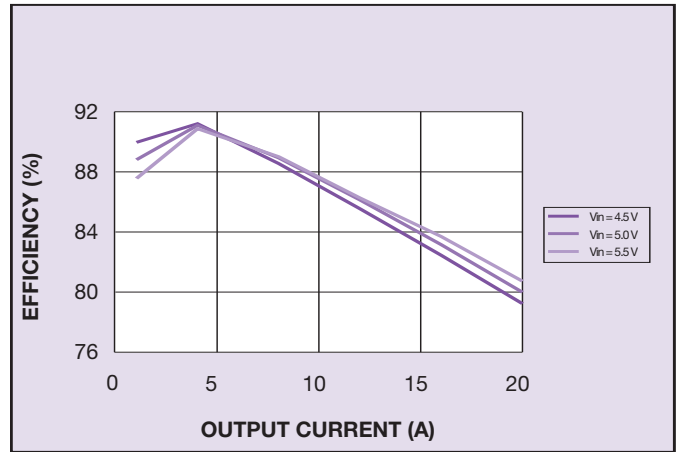


Figure 13: Efficiency when Sourcing

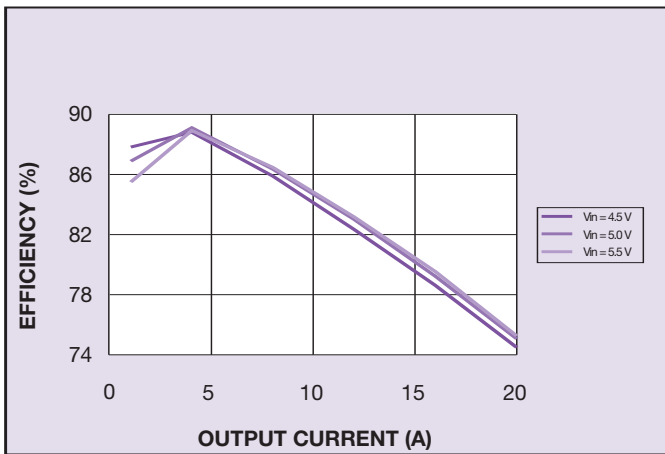


Figure 14: Efficiency when Sinking

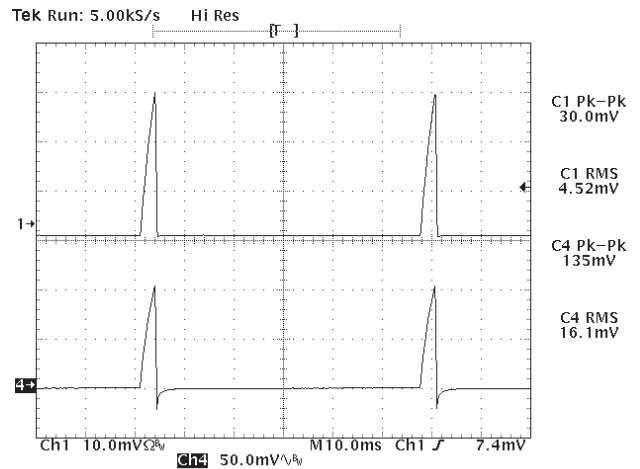


Figure 15: Short Circuit Characteristic (Channel 1: Output Current at 10A/div, Channel 4: Output Voltage)

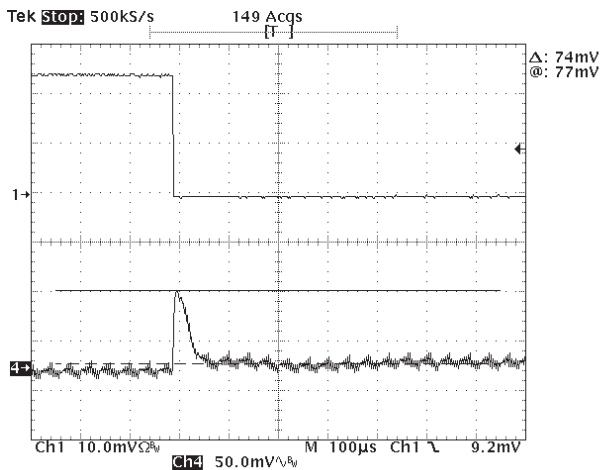


Figure 16: Transient Response 75-50% (Sinking) (Channel 1: Current Load Step at 2A/div, 4: Output Voltage Deviation)

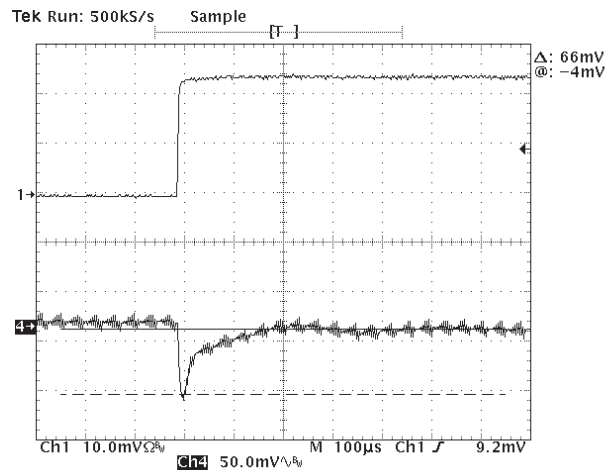


Figure 17: Transient Response 50-75% (Sourcing) (Channel 1: Current Load Step at 2A/div, 4: Output Voltage Deviation)

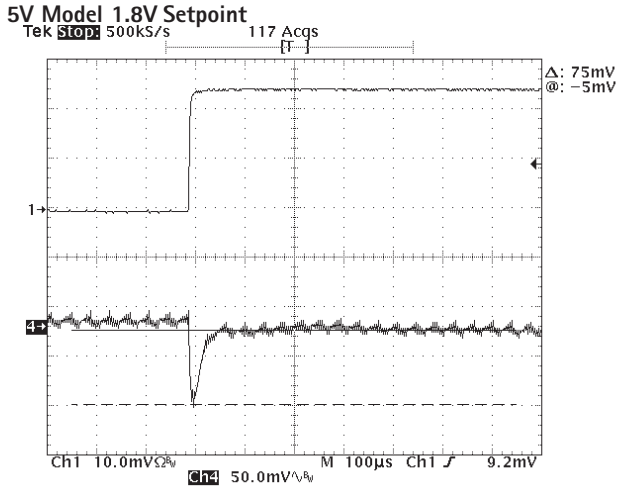


Figure 18: Transient Response 50 - 75% (Sinking)
(Channel 1: Current Load Step at 2A/div
4: Output Voltage Deviation)

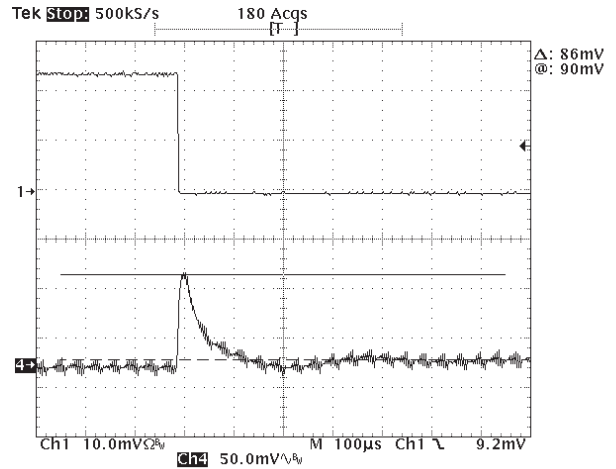


Figure 19: Transient Response 75 - 50% (Sourcing)
(Channel 1: Current Load Step at 2A/div
4: Output Voltage Deviation)

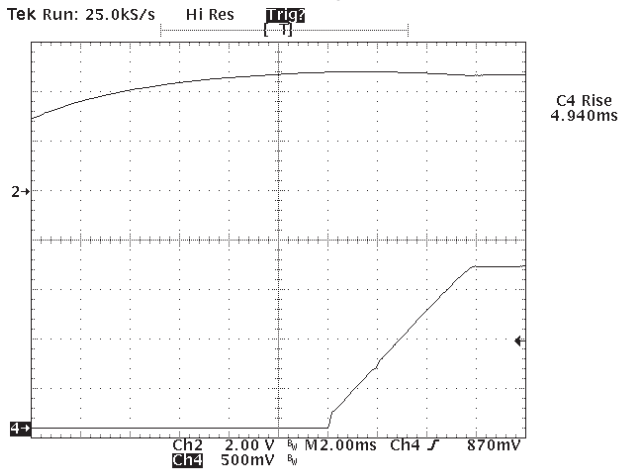


Figure 20: Typical Power Up
(Channel 2: DC Input, Channel 4: Output Voltage)

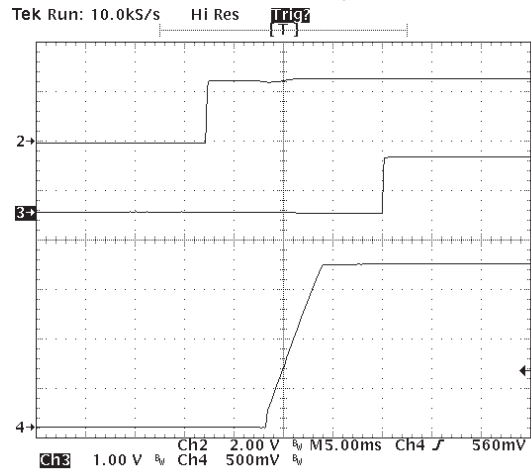


Figure 21: Control On/Off
(Channel 2: Remote ON/OFF, Channel 3: Power Good,
Channel 4: Output Voltage)

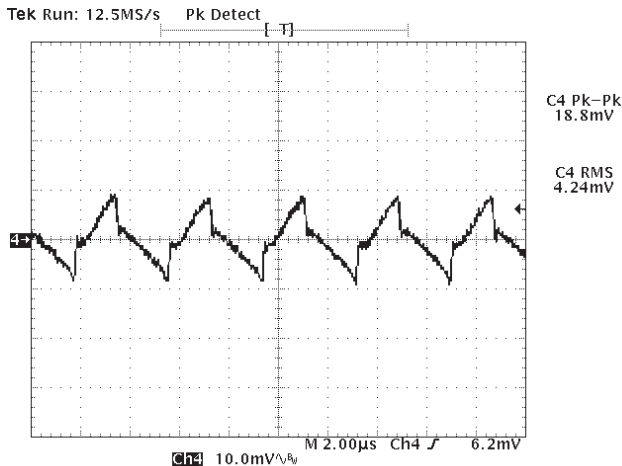


Figure 22: Typical Ripple and Noise

5V Model 3.3V Setpoint

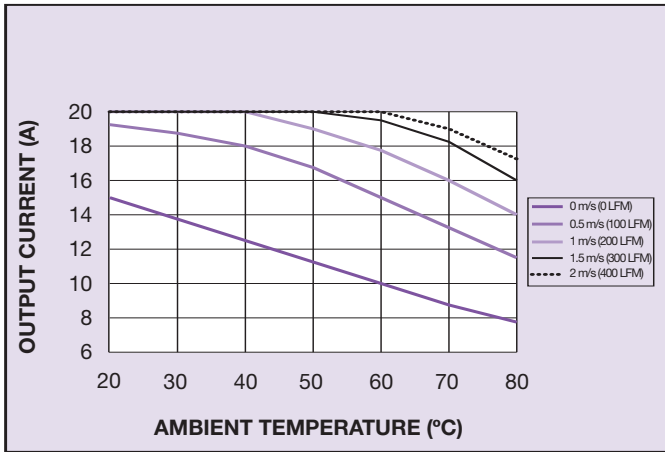


Figure 23: Thermal De-rating Curve

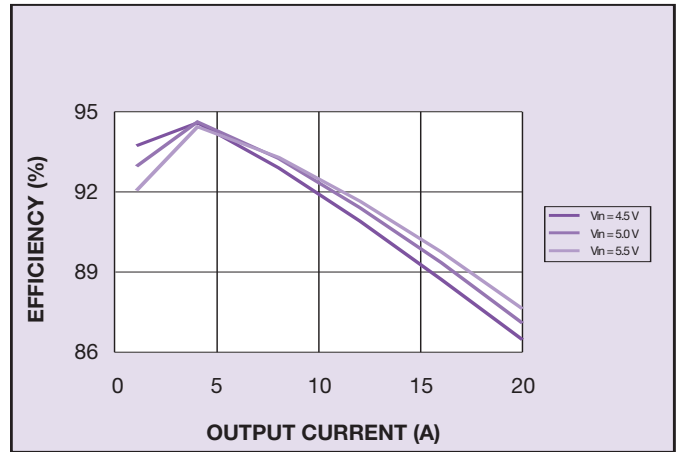


Figure 24: Efficiency when Sourcing

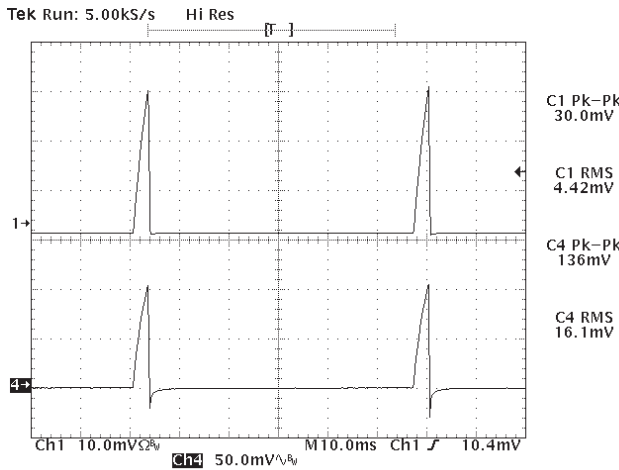


Figure 25: Short Circuit Characteristic (Channel 1: Output Current at 10A/div, Channel 4: Output Voltage)

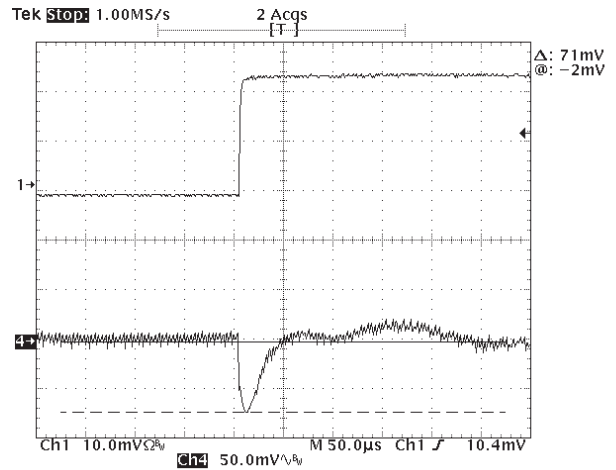


Figure 26: Transient Response 50-75% (Sourcing) (Channel 1: Current Load Step at 2A/div, Channel 4: Output Voltage Deviation)

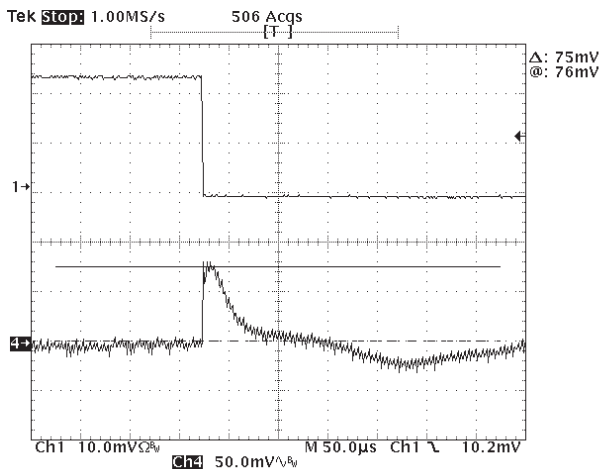


Figure 27: Transient Response 75 - 50% (Sourcing) (Channel 1: Current Load Step at 2A/div, Channel 4: Output Voltage Deviation)

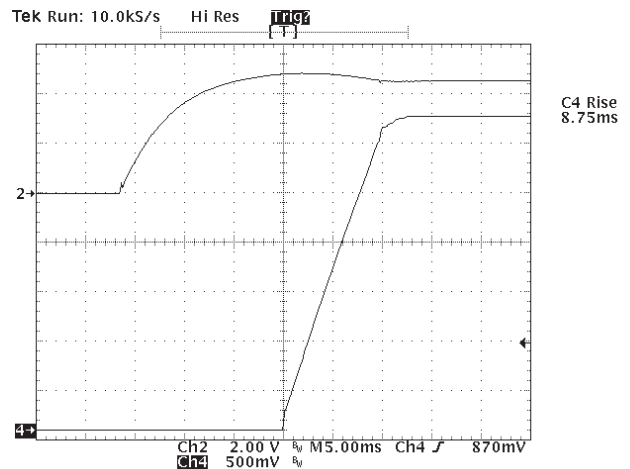


Figure 28: Typical Power Up (Channel 2: DC Input, Channel 4: Output Voltage)

5V Model 3.3V Setpoint

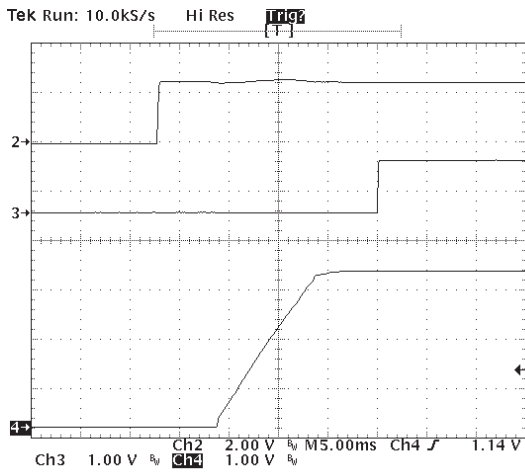


Figure 29: Control On/Off
 (Channel 2: Remote ON/OFF, Channel 3: Power Good
 Channel 4: Output Voltage)

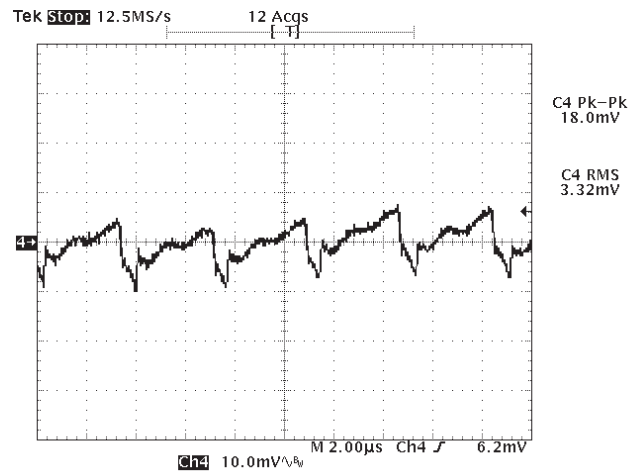


Figure 30: Typical Ripple and Noise

12V Model 0.9V Setpoint

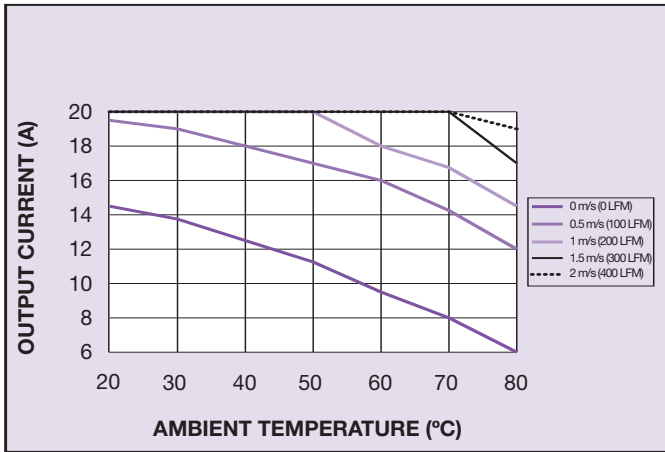


Figure 31: Thermal De-rating Curve

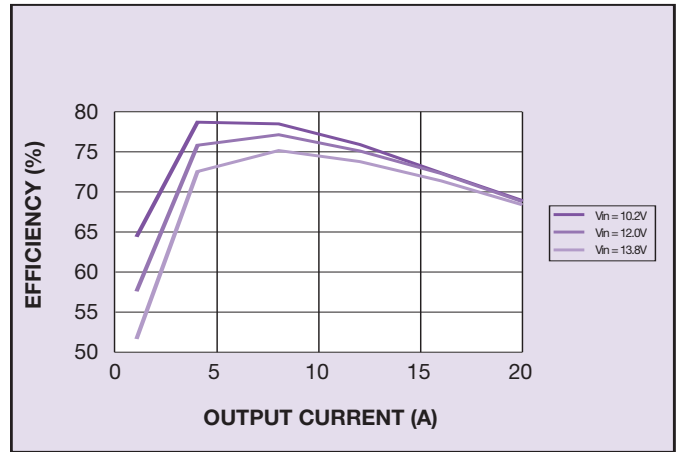


Figure 32: Efficiency when Sourcing

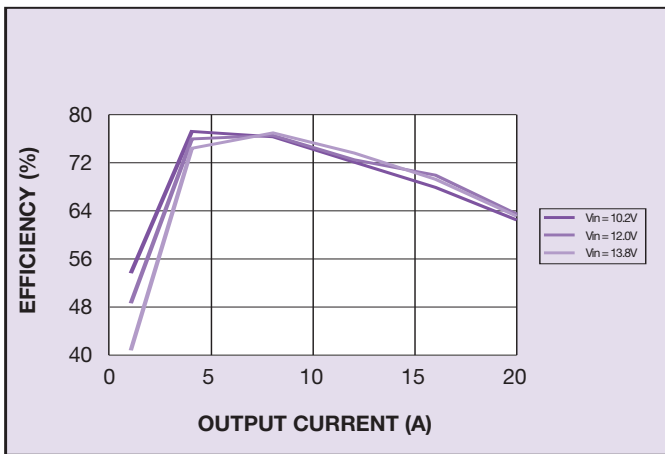


Figure 33: Efficiency when Sinking

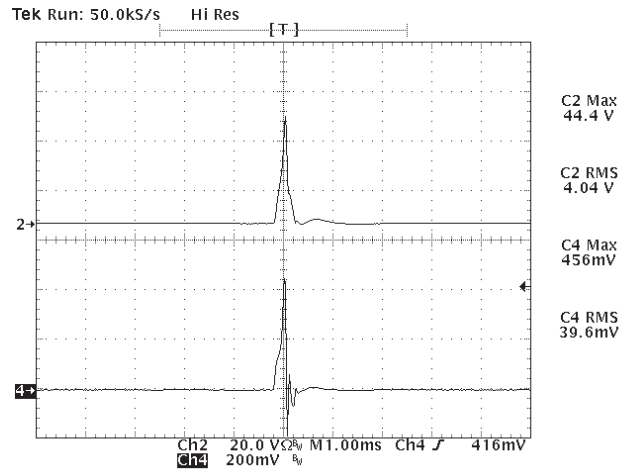


Figure 34: Short Circuit Characteristic (Channel 2: Output Current at 10A/div, Channel 4: Output Voltage)

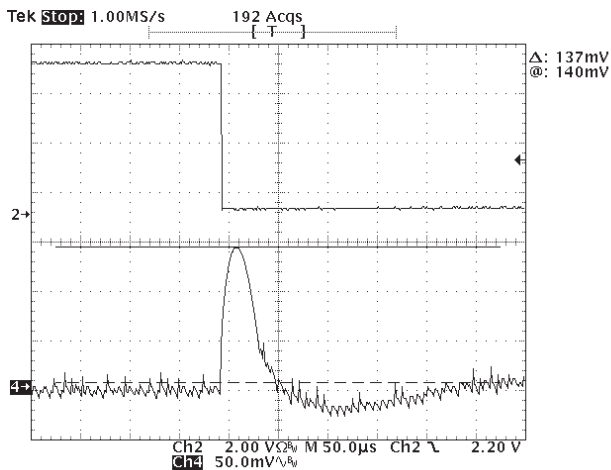


Figure 35: Transient Response 75-50% (Sinking) (Channel 2: Current Load Step at 2A/div 4: Output Voltage Deviation)

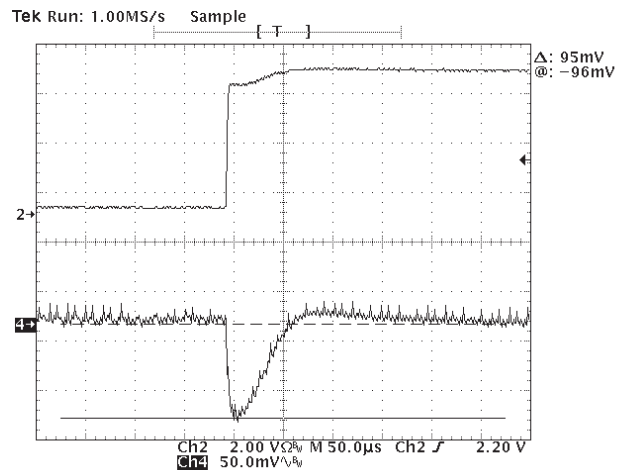


Figure 36: Transient Response 50-75% (Sourcing) (Channel 2: Current Load Step at 2A/div 4: Output Voltage Deviation)

12V Model 0.9V Setpoint

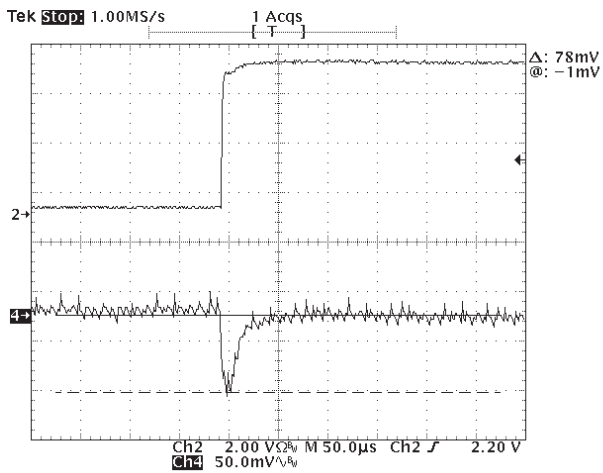


Figure 37: Transient Response 50 - 75% (Sinking)
(Channel 2: Current Load Step at 2A/div
4: Output Voltage Deviation)

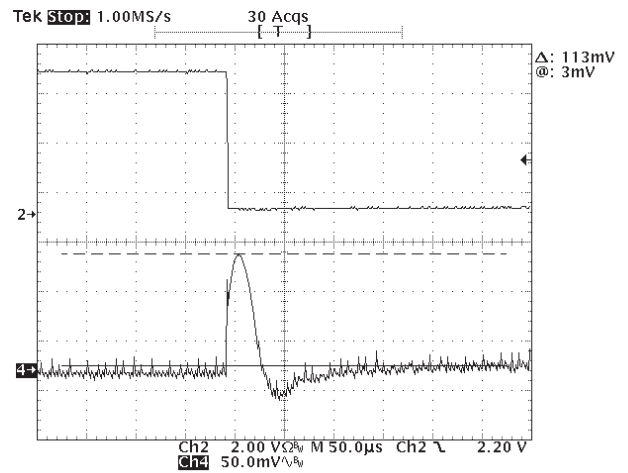


Figure 38: Transient Response 75 - 50% (Sourcing)
(Channel 2: Current Load Step at 2A/div
4: Output Voltage Deviation)

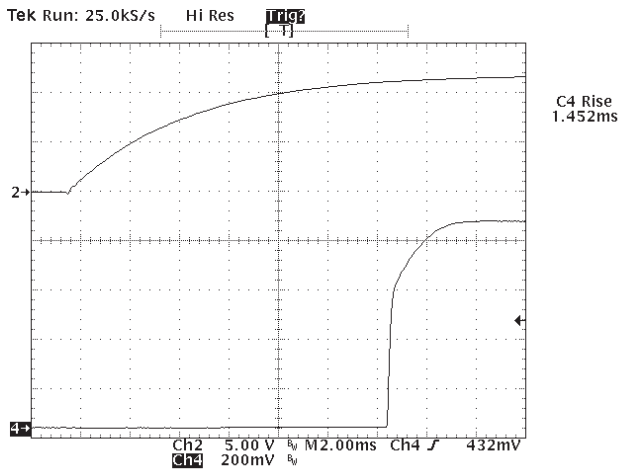


Figure 39: Typical Power Up
(Channel 2: DC Input, Channel 4: Output Voltage)

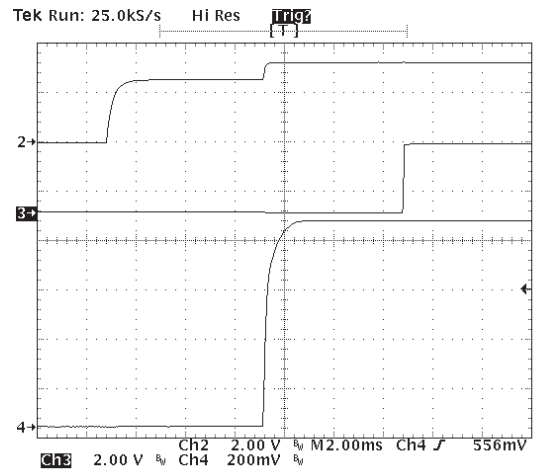


Figure 40: Control On/Off
(Channel 2: Remote ON/OFF, Channel 3: Power Good
Channel 4: Output Voltage)

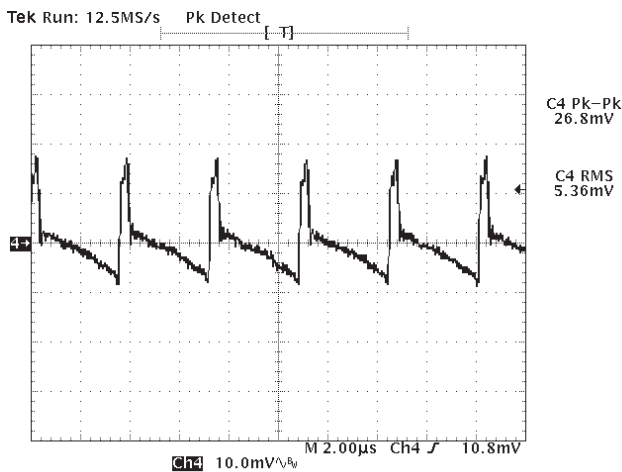


Figure 41: Typical Ripple and Noise

12V Model 2.5V Setpoint

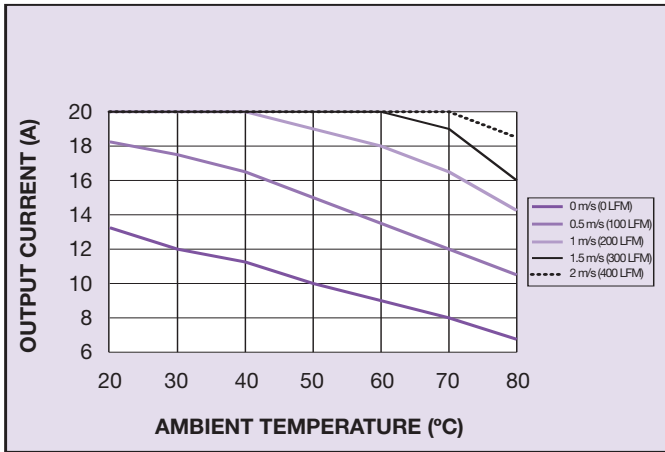


Figure 42: Thermal De-rating Curve

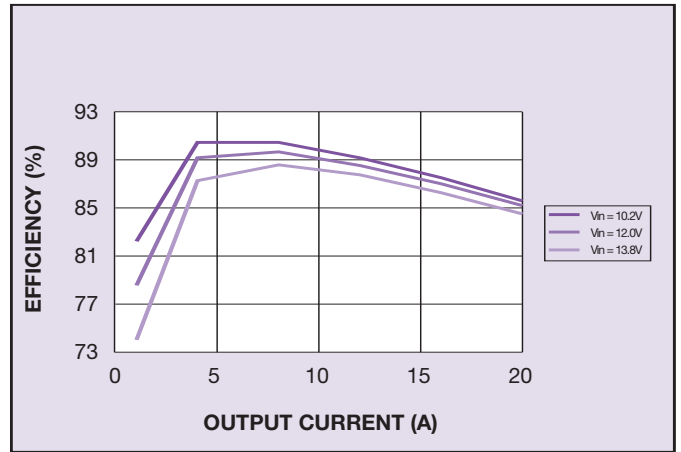


Figure 43: Efficiency when Sourcing

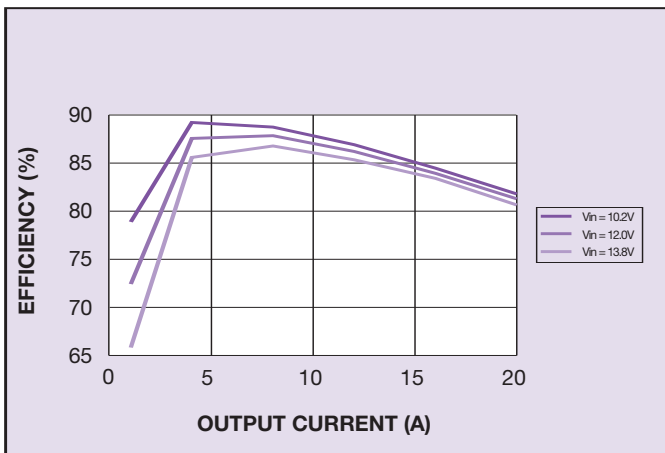


Figure 44: Efficiency when Sinking

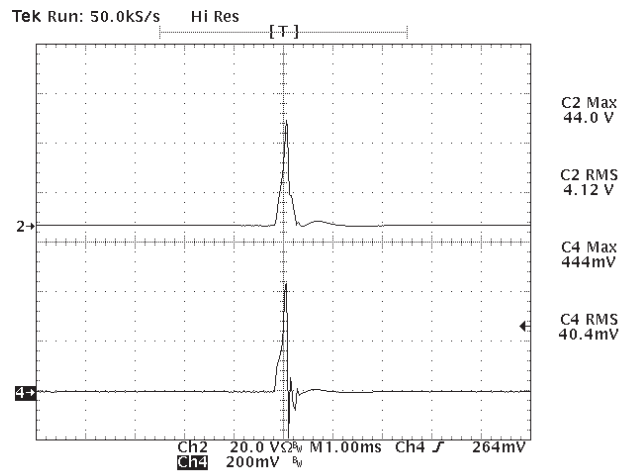


Figure 45: Short Circuit Characteristic (Channel 2: Output Current at 10A/div, Channel 4: Output Voltage)

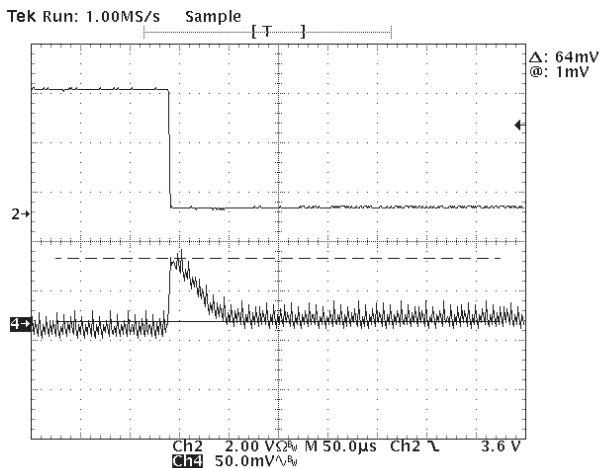


Figure 46: Transient Response 75-50% (Sinking) (Channel 2: Current Load Step at 2A/div 4: Output Voltage Deviation)

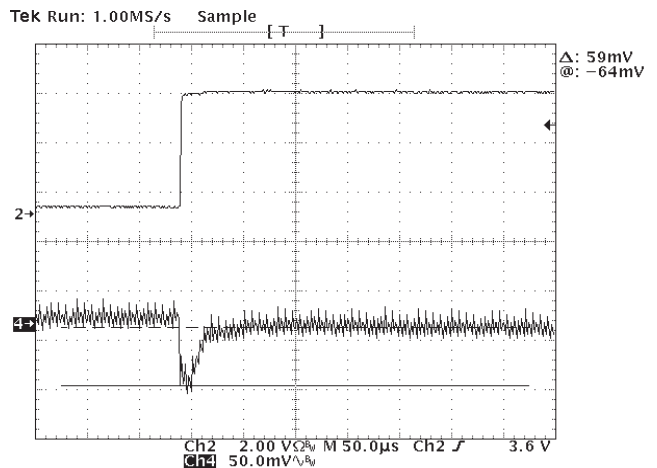


Figure 47: Transient Response 50-75% (Sourcing) (Channel 2: Current Load Step at 2A/div 4: Output Voltage Deviation)

12V Model 2.5V Setpoint

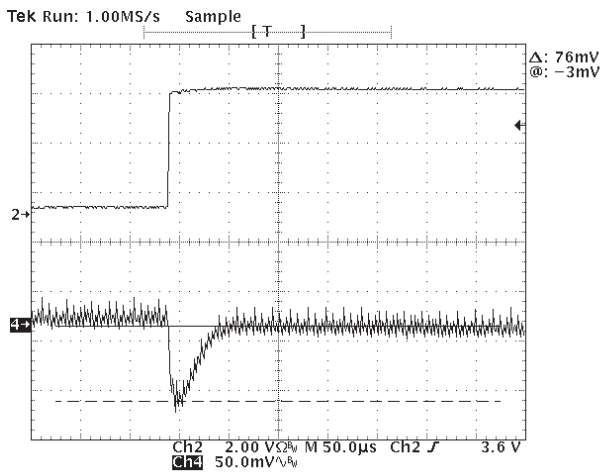


Figure 48: Transient Response 50 - 75% (Sinking)
(Channel 2: Current Load Step at 2A/div
4: Output Voltage Deviation)

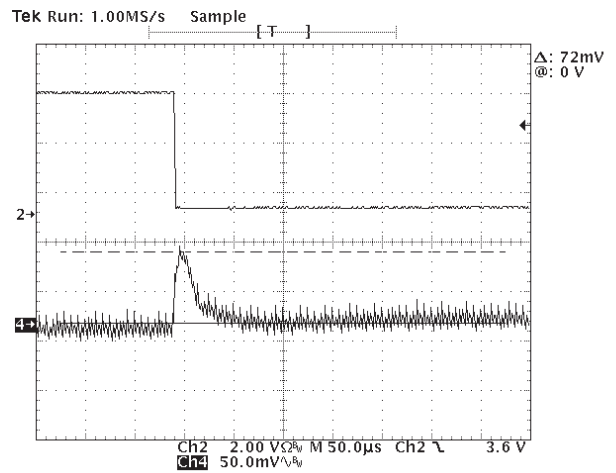


Figure 49: Transient Response 75 - 50% (Sourcing)
(Channel 2: Current Load Step at 2A/div
4: Output Voltage Deviation)

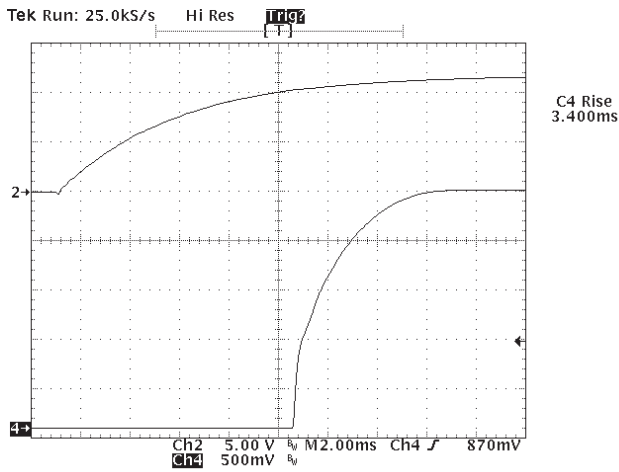


Figure 50: Typical Power Up
(Channel 2: DC Input, Channel 4: Output Voltage)

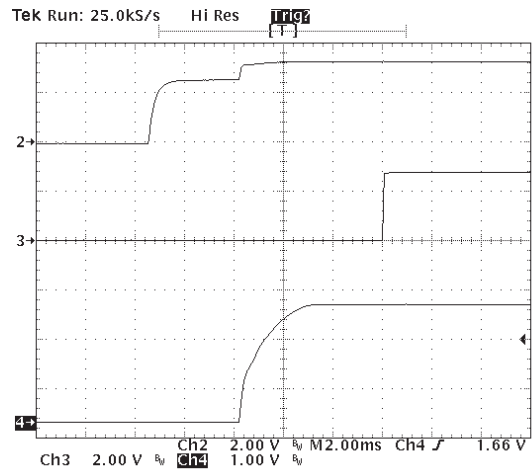


Figure 51: Control On/Off
(Channel 2: Remote ON/OFF, Channel 3: Power Good
Channel 4: Output Voltage)

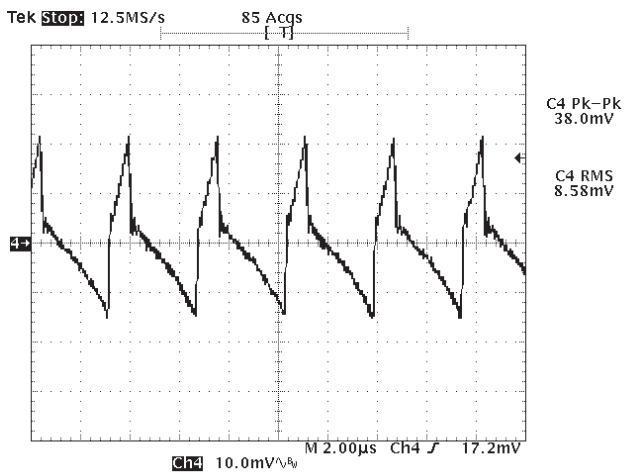


Figure 52: Typical Ripple and Noise

12V Model 5.0V Setpoint

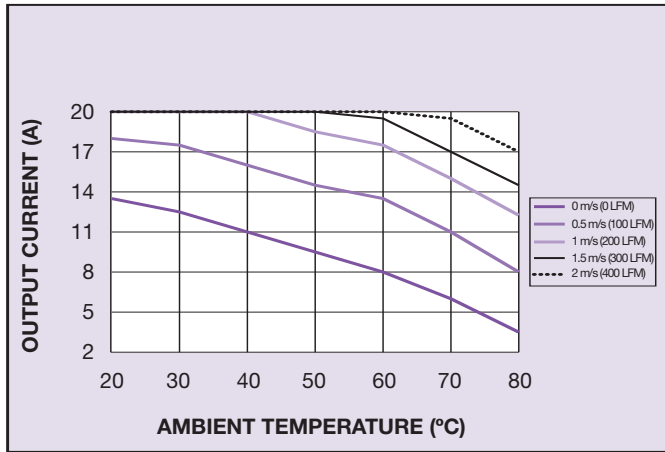


Figure 53: Thermal De-rating Curve

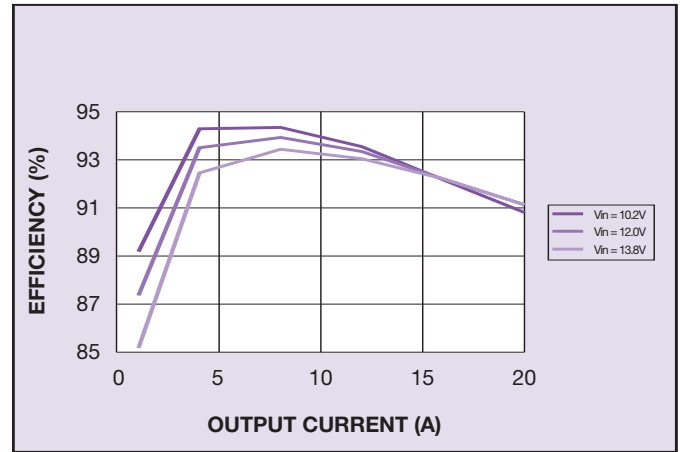


Figure 54: Efficiency when Sourcing

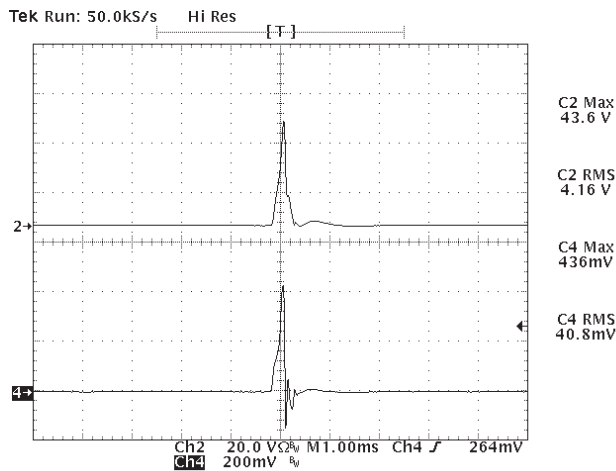


Figure 55: Short Circuit Characteristic (Channel 2: Output Current at 10A/div, Channel 4: Output Voltage)

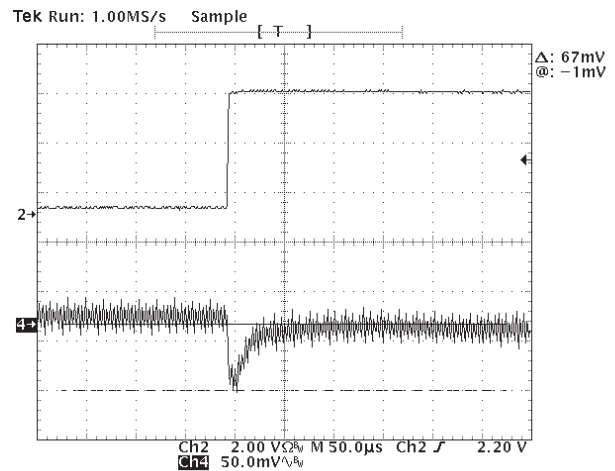


Figure 56: Transient Response 50-75% (Sourcing) (Channel 2: Current Load Step at 2A/div, Channel 4: Output Voltage Deviation)

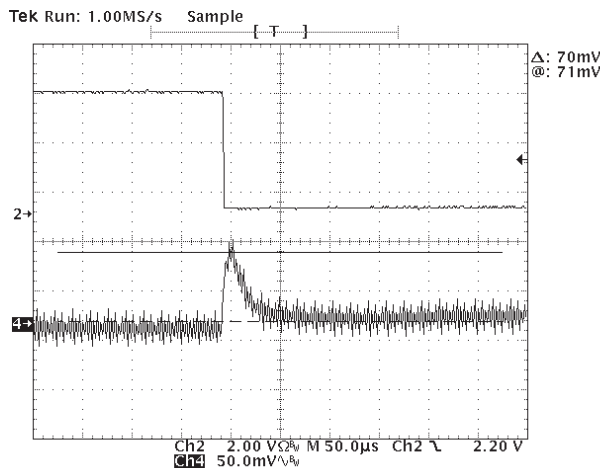


Figure 57: Transient Response 75 - 50% (Sourcing) (Channel 2: Current Load Step at 2A/div, Channel 4: Output Voltage Deviation)

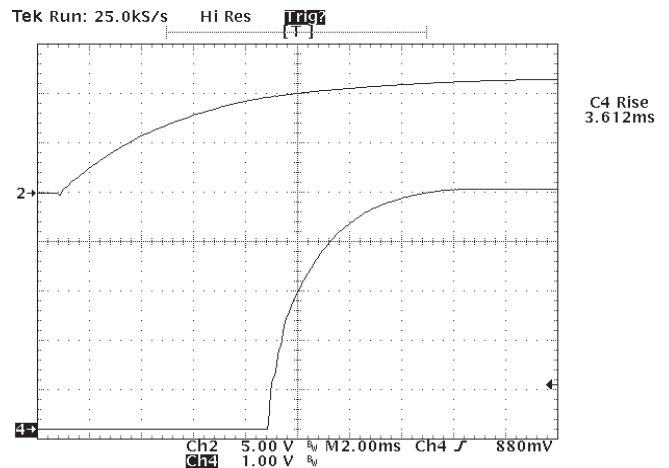


Figure 58: Typical Power Up (Channel 2: DC Input, Channel 4: Output Voltage)

12V Model 5.0V Setpoint

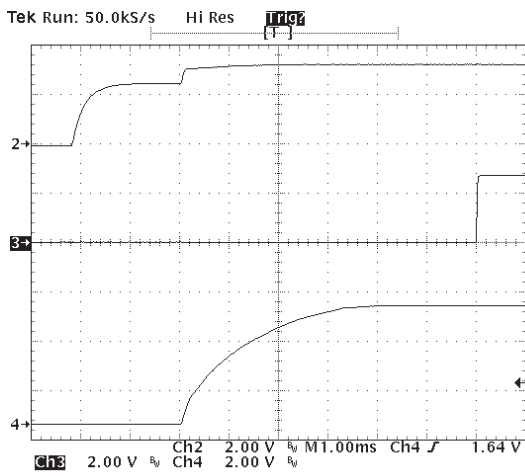


Figure 59: Control On/Off
 (Channel 2: Remote ON/OFF, Channel 3: Power Good
 Channel 4: Output Voltage)

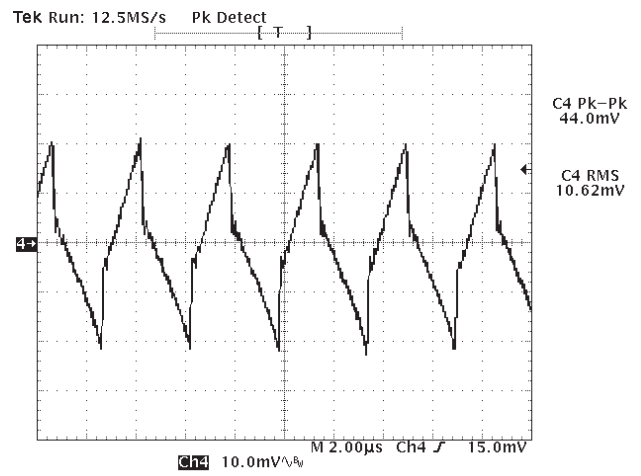
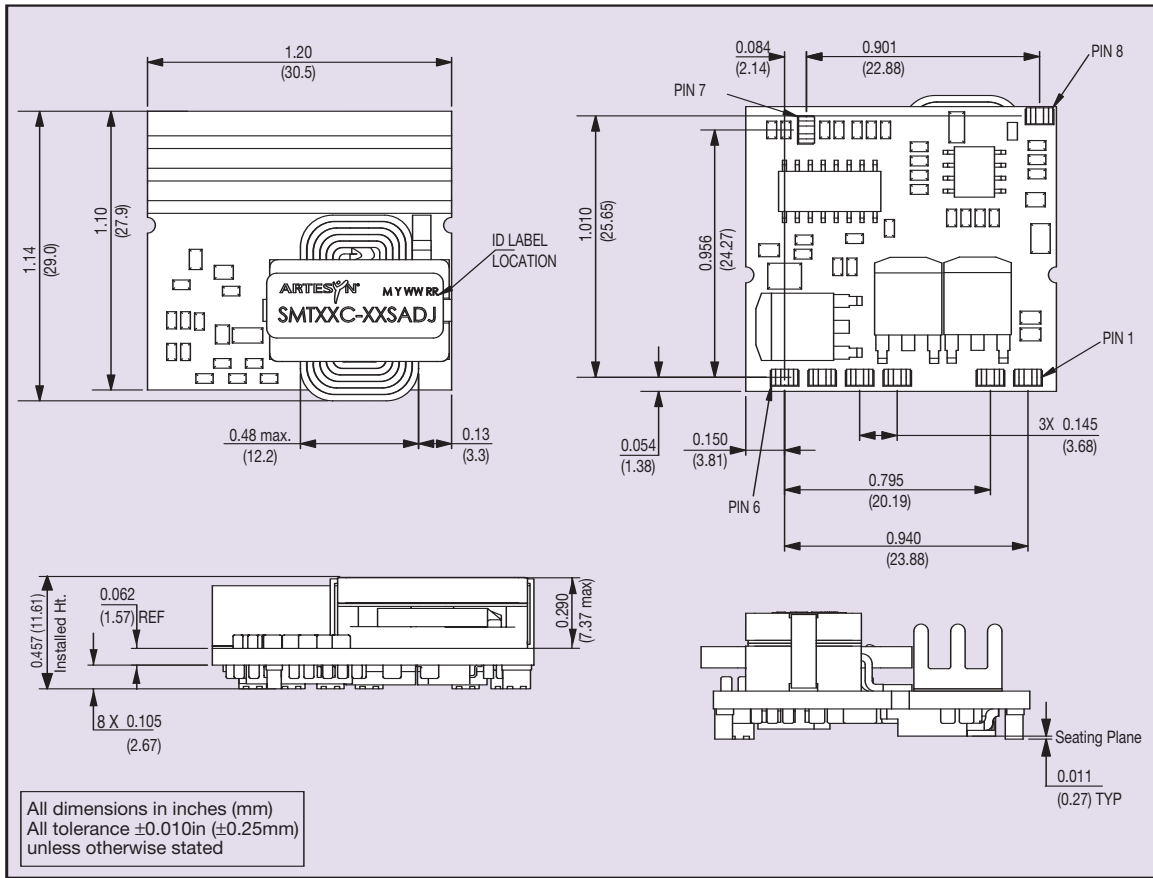


Figure 60: Typical Ripple and Noise



Pin Connections	
Pin No.	Function
1	Vout
2	Vout
3	Power Good
4	GND
5	GND
6	Vin
7	Trim
8	Remote ON/OFF

Figure 61: Mechanical Drawing and Pin Connections

Note 1

Thermal reference point is defined as the highest temperature measured at any one of the specified thermal reference points. Refer to Section 7.2 of Application Note 169 for more details.

Note 2

The control pin is referenced to Ground

Note 3

The SMT20C is supplied as standard with Positive Logic.
Control input pulled low: Unit Disabled
Control input left open: Unit Enabled

Note 4

Thermal reference set up: Unit mounted on an edge card test board 215mm x 115mm. Test board mounted vertically. For test details and recommended set-up see Application Note 169.

Note 5

3-200Hz, sweep at 1/2 octave/min from low to high frequency, and then from high to low. Thirty minute dwell at all resonant points.

CAUTION: Hazardous internal voltages and high temperatures. Ensure that unit is accessible only to trained personnel. The user must provide the recommended fusing in order to comply with safety approvals.

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