SMT10E Series

3.0 Vin to 5.5 Vin Single output

- 10 A Current rating
- Input voltage range: 3.0 Vdc to 5.5 Vdc
- Output voltage range: 0.8 Vdc to 3.63 Vdc
- Ultra high efficiency: 96% @ 5 Vin and 3.3 Vout
- Extremely low internal power dissipation
- Minimal thermal design concerns
- Designed in reliability: MTBF of >7 million hours per Telcordia SR-332
- Ideal solution where board space is at a premium or tighter card pitch is required
- Industry standard footprint and pin out
- Available RoHS compliant

The SMT10E Series are non-isolated dc-dc converters packaged in a single-in-line footprint giving designers a cost effective solution for conversion from either a 5 V or 3.3 V input to output voltages of 3.3 Vdc to 0.8 Vdc. The SIL10E offers both fixed outputs and wide a output trim range, which allows maximum design flexibility and a pathway for future upgrades. Local voltage conversion by the SMT10E Series from existing 5 V or 3.3 V system voltages eliminates the need for redesign of existing power architectures when voltage requirements change. The SIL10E is designed for applications that include distributed power, workstations, optical network and wireless applications. Implemented using state of the art surface mount technology and automated manufacturing techniques, the SIL10E offers compact size and efficiencies of up to 96%.

[2 YEAR WARRANTY]

ARTESYN TECHNOLOGIES

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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		5.5	V DC	$V_{in}(+) - V_{in}(-)$
Input voltage - peak/surge	V_{surge}	-0.3		6	V DC	2s max, non-repetitive
Operating temperature	T_{op}	-40		100	°C	Measured at thermal reference points, See Note 1 for thermal Derating
Storage temperature	$T_{storage}$	-40		125	°C	
Output power (S1V2)	$P_{out\ (max)}$	0		13.2	W	
Output power (S1V5)	$P_{out\ (max)}$	0		16.5	W	
Output power (S1V8)	$P_{out\ (max)}$	0		19.8	W	
Output power (S2V5)	Pout (max)	0		27.5	W	
Output power (S3V3)	$P_{out\ (max)}$	0		36.3	W	
Output power (W3V3)	$P_{out\ (max)}$	0		36.3	W	

All specifications are typical at nominal input Vin = 5V, full load under any resistive load combination at 25°C unless otherwise stated.

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input voltage - operating	$V_{in\ (oper)}$	3	5	5.5	V DC	
Input current - no load	I_{in}		70	150	mA DC	V_{in} (min) - V_{in} (max), enabled
Input current - Quiescent	$I_{in\ (off)}$		2		mA DC	Converter disabled
Inrush current (i^2t)					$A^2\mu s$	
Input ripple current					mA rms	
Input fuse*				12.5	A	Slowblow/antisurge HRC recommended

* Fuse A - S(T) 1.25 x 0.25 inches
SIBA P/N 70-065-65/12.5ARS

Turn On/Off

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input voltage - turn on	$V_{in\ (on)}$	2.25	2.70	3	V DC	Will regulate @ V_{in} >3V if $V_{out} \leq$ 2V5
Turn on delay - enabled, then power applied	T_{delay} (power)		20		msec	With the enable signal asserted, this is the time from when the input voltage reaches the minimum specified operating voltage until the output voltage is within the total regulation band
Turn on delay - power applied, then enabled	T_{delay} (enable)		20		msec	V_{in} = V_{in} (nom), then enabled. This is the time taken until the output voltage is within the total error band
Rise time	T_{rise}		15		msec	From 10% to 90%; full resistive load, no external capacitance

Signal Electrical Interface

Characteristic - Signal Name	Symbol	Min	Typ	Max	Units	Notes and Conditions
At remote/control ON/OFF pin Open collector or equivalent compatible						**See Notes 2 and 3** See Application Note 134 for Remote ON/OFF details
Control pin open circuit voltage	V_{ih}		0		V	I_{ih} = 0 µA; open circuit voltage
High level input current	I_{ih}			300	µA	Current flowing into control pin when pin is pulled high
High level input voltage	V_{ih}	1.2			Vin	Converter guaranteed OFF when control pin is greater than V_{ih} (min)
Acceptable high level leakage current	I_{ih} (leakage)			-10	µA	Acceptable leakage current from control pin into the open collector driver (neg = from converter)
Low level input voltage	V_{il}	0		0.5	V	Converter guaranteed ON when control pin is less than V_{il} (max)
Low level input current	I_{il}			20	µA	V_{il} = < 0.4 V

Reliability and Service Life

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Mean time between failure	MTBF	680,000			Hours	MIL-HDBK-217F, V_{in} = $V_{in\ (nom)}$; I_{out} = $I_{out\ (max)}$; ambient 25°C; ground benign environment
Mean time between failure	MTBF	7,042,000			Hours	Telcordia SR-332
Mean time between failure	MTBF	TBA			Hours	Demonstrated. This entry will be periodically updated as the number of test hours increase

Other Specifications

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Switching frequency	F_{sw}		300		kHz	Fixed frequency
Weight			6.3		g	
Coplanarity			100		µm	Measured from seating plane

EMC
Electromagnetic Compatibility

Phenomenon	Port	Standard	Test level	Criteria	Notes and conditions
Immunity:					
Conducted immunity		EN61000-4-6			
Radiated immunity		EN61000-4-3			
ESD	Enclosure	EN61000-4-2	6kV contact 8kV air	NP	As per ETS 300 386-1 table 5

Performance criteria:

NP: Normal Performance: EUT shall withstand applied test and operate within relevant limits as specified without damage.
RP: Reduced Performance: EUT shall withstand applied test. Reduced performance is permitted within specified limits, resumption to normal performance shall occur at the cessation of the test.
LFS: Loss of Function (self recovery): EUT shall withstand applied test without damage, temporary loss of function permitted during test. Unit will self recover to normal performance after test.

Referenced ETSI standards:

ETS 300 386-1 table 5 (1997): Public telecommunication network equipment, EMC requirements
ETS 300 132-2 (1996): Power supply interface at the input to telecommunication equipment: Part 2 operated by direct current (DC)
ETR 283 (1997): Transient voltages at interface A on telecommunication direct current (DC) power distributions

Safety Agency Approvals

Characteristic	Notes and Conditions
UL/cUL60950	File No. E174104
TÜV Product Services EN60950	B03 10 38572 037
CB certficate and report to IEC60950	DE3-51686M1

Material Ratings

Characteristic - Signal Name	Notes and Conditions
Flammability rating	UL94V-0

Model Numbers

Model Number	Input Voltage	Output Voltage	Output Current (Max.)	Typical Efficiency	Max. Load Regulation
SMT10E-05S1V2J	3.0 - 5.5VDC	1.2V	10A	89%	1.0%
SMT10E-05S1V5J	3.0 - 5.5VDC	1.5V	10A	90%	1.0%
SMT10E-05S1V8J	3.0 - 5.5VDC	1.8V	10A	92%	1.0%
SMT10E-05S2V5J	3.0 - 5.5VDC	2.5V	10A	95%	1.0%
SMT10E-05S3V3J	4.5 - 5.5VDC	3.3V	10A	96%	1.0%
SMT10E-05W3V3J	3.0 - 5.5VDC	3.3V	10A	96%	1.0%

RoHS Compliance Ordering Information

RoHS 2002/95/EC

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.

S1V2 Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		2.7	2.8	A DC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max.); $V_o = V_o$ (nom)
Reflected ripple current	I_{in} (ripple)		150		mA rms	$I_{out} = I_{out}$ (max.), measured without external filter
Input capacitance - internal filter	C_{input}		18.8		µF	Internal to converter
Input capacitance - external bypass	C_{bypass}	100			µF	Recommended customer added capacitance

S1V2 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	1.16	1.2	1.24	V DC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	1.14		1.25	V DC	For all line, static load and temperature until end of life
Line regulation			0.2	0.5	%	$I_{out} = I_{out}$ (nom); V_{in} (min) to V_{in} (max)
Load regulation				1.0	%	$V_{in} = V_{in}$ (nom); I_{out} (min) to I_{out} (max)
Output current continuous	I_{out}	0		10	A DC	
Output current - short circuit	I_{sc}		10	20	A rms	Continuous, unit auto recovers from short, V_o < 100mV
Output voltage - noise	V_{p-p} V_{rms}			50 25	mV pk-pk mV rms	Measurement bandwidth: 20MHz. See Application Note 168 for measurement set-up details

S1V2 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		60		mV	Peak deviation for 50% to 75% step load, di/dt = 100mA/µsec Measurement taken with no external capacitors
Load transient response - recovery	$T_{recovery}$		50		µsec	Settling time to within 1% of output set point voltage for 50% to 75% step load. Measurement taken with no external capacitors
External load capacitance	C_{ext}	0		10,000	µF	

S1V2 Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Allowable output voltage*				10	%	Trim up (% of V_o nom).
		10			%	Trim down (% of V_o nom) See Application Note 168 for details of trim equations and trim curves
Remote sense voltage				10	%	If trim up is invoked de-rate power accordingly (remote sense + trim ≤ 10%)

*V_{in} (min) = 3.3V at max. trim-up

S1V2 Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	η	86.0	89.0		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	η	86.0	89.0		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

S1V5 Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		3.3	3.4	A DC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max.); $V_o = V_o$ (nom)
Reflected ripple current	I_{in} (ripple)		150		mA rms	$I_{out} = I_{out}$ (max.), measured without external filter
Input capacitance - internal filter	C_{input}		18.8		µF	Internal to converter
Input capacitance - external bypass	C_{bypass}	100			µF	Recommended customer added capacitance

S1V5 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	1.45	1.5	1.55	V DC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	1.42		1.57	V DC	For all line, static load and temperature until end of life
Line regulation			0.2	0.5	%	$I_{out} = I_{out}$ (nom); V_{in} (min) to V_{in} (max)
Load regulation				1.0	%	$V_{in} = V_{in}$ (nom); I_{out} (min) to I_{out} (max)
Output current continuous	I_{out}	0		10	A DC	
Output current - short circuit	I_{sc}		10	20	A rms	Continuous, unit auto recovers from short, V_o < 100mV
Output voltage - noise	V_{p-p} V_{rms}			50 25	mV pk-pk mV rms	Measurement bandwidth: 20MHz. See Application Note 168 for measurement set-up details

S1V5 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		60		mV	Peak deviation for 50% to 75% step load, di/dt = 100mA/µsec Measurement taken with no external capacitors
Load transient response - recovery	$T_{recovery}$		50		µsec	Settling time to within 1% of output set point voltage for 50% to 75% step load. Measurement taken with no external capacitors
External load capacitance	C_{ext}	0		10,000	µF	

S1V5 Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Allowable output voltage*				10	%	Trim up (% of V_o nom).
		10			%	Trim down (% of V_o nom) See Application Note 168 for details of trim equations and trim curves
Remote sense voltage				10	%	If trim up is invoked de-rate power accordingly (remote sense + trim ≤ 10%)

*V_{in} (min) = 3.3V at max. trim-up

S1V5 Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	η	88.0	90.0		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	η	88.0	90.0		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

S1V8 Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		3.9	4.1	A DC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max.); $V_o = V_o$ (nom)
Reflected ripple current	I_{in} (ripple)		150		mA rms	$I_{out} = I_{out}$ (max.), measured without external filter
Input capacitance - internal filter	C_{input}		18.8		µF	Internal to converter
Input capacitance - external bypass	C_{bypass}	100			µF	Recommended customer added capacitance

S1V8 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	1.75	1.8	1.86	V DC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	1.72		1.88	V DC	For all line, static load and temperature until end of life
Line regulation			0.2	0.5	%	$I_{out} = I_{out}$ (nom); V_{in} (min) to V_{in} (max)
Load regulation				1.0	%	$V_{in} = V_{in}$ (nom); I_{out} (min) to I_{out} (max)
Output current continuous	I_{out}	0		10	A DC	
Output current - short circuit	I_{sc}		10	20	A rms	Continuous, unit auto recovers from short, V_o < 100mV
Output voltage - noise	V_{p-p} V_{rms}			50 25	mV pk-pk mV rms	Measurement bandwidth: 20MHz. See Application Note 168 for measurement set-up details

S1V8 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		60		mV	Peak deviation for 50% to 75% step load, di/dt = 100mA/µsec Measurement taken with no external capacitors
Load transient response - recovery	$T_{recovery}$		50		µsec	Settling time to within 1% of output set point voltage for 50% to 75% step load. Measurement taken with no external capacitors
External load capacitance	C_{ext}	0		10,000	µF	

S1V8 Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Allowable output voltage*				10	%	Trim up (% of V_o nom).
		10			%	Trim down (% of V_o nom) See Application Note 168 for details of trim equations and trim curves
Remote sense voltage				10	%	If trim up is invoked de-rate power accordingly (remote sense + trim ≤ 10%)

*V_{in} (min) = 3.3V at max. trim-up

S1V8 Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	η	89.5	92.0		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	η	89.0	91.5		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

S2V5 Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		5.3	5.45	A DC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max.); $V_o = V_o$ (nom)
Reflected ripple current	I_{in} (ripple)		200		mA rms	$I_{out} = I_{out}$ (max.), measured without external filter
Input capacitance - internal filter	C_{input}		18.8		µF	Internal to converter
Input capacitance - external bypass	C_{bypass}	100			µF	Recommended customer added capacitance

S2V5 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	2.43	2.5	2.57	V DC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	2.38		2.612	V DC	For all line, static load and temperature until end of life
Line regulation			0.2	0.5	%	$I_{out} = I_{out}$ (nom); V_{in} (min) to V_{in} (max)
Load regulation				1.0	%	$V_{in} = V_{in}$ (nom); I_{out} (min) to I_{out} (max)
Output current continuous	I_{out}	0		10	A DC	
Output current - short circuit	I_{sc}		10	20	A rms	Continuous, unit auto recovers from short, V_o < 100mV
Output voltage - noise	V_{p-p} V_{rms}			60 25	mV pk-pk mV rms	Measurement bandwidth: 20MHz. See Application Note 168 for measurement set-up details

S2V5 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		50		mV	Peak deviation for 50% to 75% step load, di/dt = 100mA/µsec Measurement taken with no external capacitors
Load transient response - recovery	$T_{recovery}$		50		µsec	Settling time to within 1% of output set point voltage for 50% to 75% step load. Measurement taken with no external capacitors
External load capacitance	C_{ext}	0		10,000	µF	

S2V5 Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Allowable output voltage*		10		10	%	Trim up (% of V_O nom).
					%	Trim down (% of V_O nom) See Application Note 168 for details of trim equations and trim curves
Remote sense voltage				10	%	If trim up is invoked de-rate power accordingly (remote sense + trim ≤ 10%)

*V_{in} (min) =3.3V at max. trim-up

S2V5 Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	η	92.5	95.0		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	η	91.5	90.0		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

S3V3 Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		6.9	7.1	ADC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max.); $V_o = V_o$ (nom)
Reflected ripple current	I_{in} (ripple)		150		mA rms	$I_{out} = I_{out}$ (max.), measured without external filter
Input capacitance - internal filter	C_{input}		18.8		µF	Internal to converter
Input capacitance - external bypass	C_{bypass}	100			µF	Recommended customer added capacitance

S3V3 Model

Electrical Characteristics – O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	V_o (nom.)	3.21	3.3	3.39	VDC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	3.15		3.45	VDC	For all line, static load and temperature until end of life
Line regulation			0.2	0.5	%	$I_{out} = I_{out}$ (nom); $V_{in\ (min)}$ to V_{in} (max)
Load regulation				1	%	$V_{in} = V_{in}$ (nom); I_{out} (min) to I_{out} (max)
Output current continuous	I_{out}	0		10	ADC	
Output current - short circuit	I_{sc}		10	20	A rms	Continuous, unit auto recovers from short, V_o < 100mV
Output voltage - noise	V_{p-p} V_{rms}			50 25	mV pk-pk mV rms	Measurement bandwidth 20MHz See Application Note 168 for set-up details

S3V3 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		50		mV	Peak deviation for 50% to 75% step load, di/dt = 100mA/µsec Measurement taken with no external capacitors
Load transient response - recovery	$T_{recovery}$		50		µsec	Settling time to within 1% of output set point voltage for 50% to 75% step load. Measurement taken with no external capacitors
External load capacitance	C_{ext}	0		10,000	µF	

S3V3 Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Allowable output voltage		10		10	% %	Trim up (% of V_o nom). Trim down (% of V_o nom) See Application Note 168 for details of trim equations and trim curves
Remote sense voltage				10	%	If trim up is invoked de-rate power accordingly (remote sense + trim ≤ 10%)

S3V3 Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	η	93.5	96.0		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	η	93.5	95.3		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

W3V3 Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		7.0	8.0	ADC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max.); $V_o = V_o$ (nom)
Reflected ripple current	I_{in} (ripple)		150		mA rms	$I_{out} = I_{out}$ (max.), measured without external filter
Input capacitance - internal filter	C_{input}		18.8		µF	Internal to converter
Input capacitance - external bypass	C_{bypass}	100			µF	Recommended customer added capacitance

W3V3 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	V_o (nom.)	3.21	3.3	3.39	VDC	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	3.15		3.45	VDC	For all line, static load and temperature until end of life
Line regulation			0.2	0.5	%	$I_{out} = I_{out}$ (nom); $V_{in\ (min)}$ to V_{in} (max)
Load regulation				1	%	$V_{in} = V_{in}$ (nom); I_{out} (min) to I_{out} (max)
Output current continuous	I_{out}	0		10	ADC	
Output current - short circuit	I_{sc}		10	20	A rms	Continuous, unit auto recovers from short, V_o < 100mV
Output voltage - noise	V_{p-p} V_{rms}			50 25	mV pk-pk mV rms	Measurement bandwidth 20MHz See Application Note 168 for set-up details

W3V3 Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Load transient response - peak deviation	$V_{dynamic}$		50		mV	Peak deviation for 50% to 75% step load, di/dt = 100mA/µsec Measurement taken with no external capacitors
Load transient response - recovery	$T_{recovery}$		50		µsec	Settling time to within 1% of output set point voltage for 50% to 75% step load. Measurement taken with no external capacitors
External load capacitance	C_{ext}	0		10,000	µF	

W3V3 Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Allowable output voltage				10	%	Trim up (% of V_o nom).
		75			%	Trim down (% of V_o nom) See Application Note 168 for details of trim equations and trim curves
Remote sense voltage				10	%	If trim up is invoked de-rate power accordingly (remote sense + trim ≤ 10%)

W3V3 Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	η	94.0	96.0		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	η	94.0	95.0		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

S1V2 Model

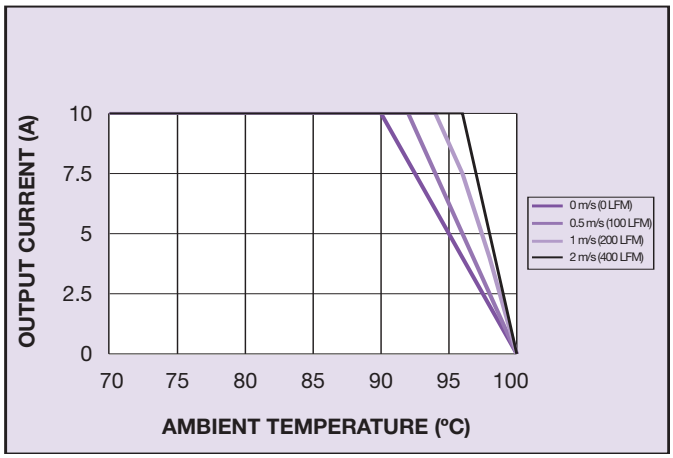


Figure 1: Derating Curve with V_{in} = 5V and V_{out} = 1.2V

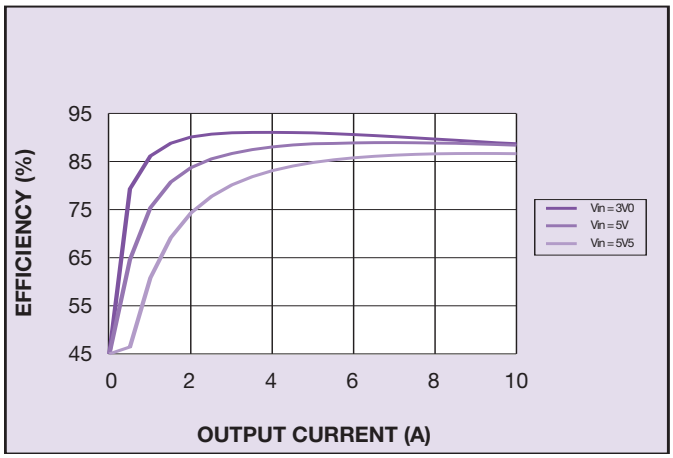


Figure 2: Efficiency vs Load

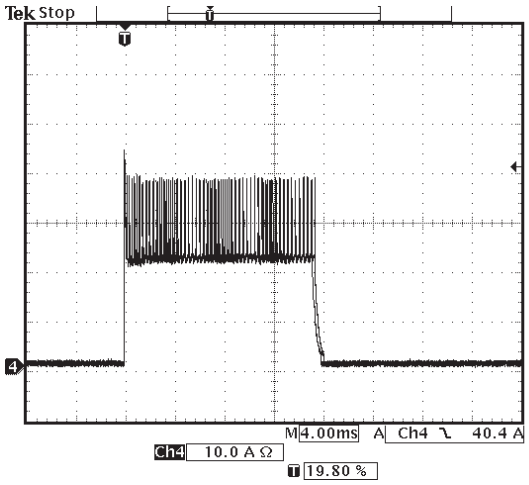


Figure 3: Short Circuit Characteristic (Channel 1: Is/c)

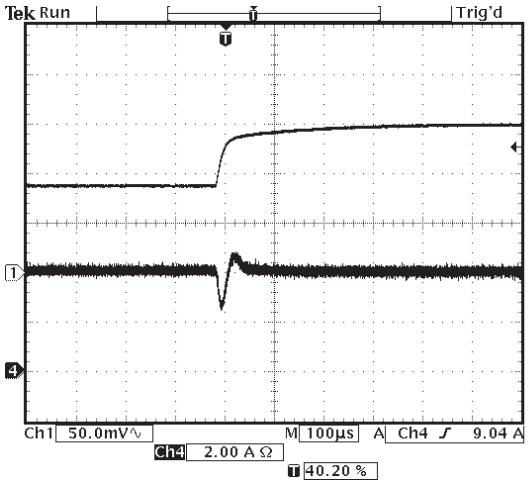


Figure 4: Typical Transient Response 75% - 100% Step Load Change (Channel 1: Vo, Channel 4: Io)

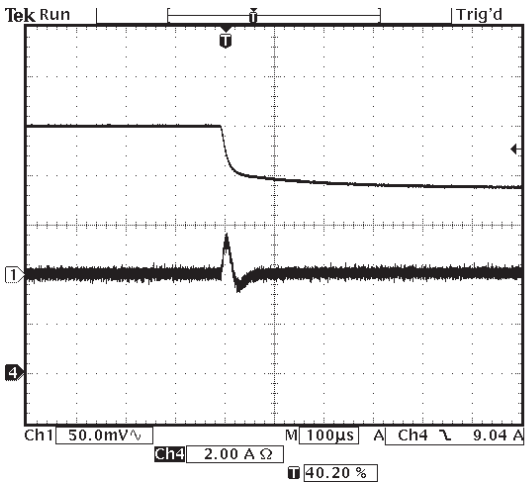


Figure 5: Typical Transient Response 100% - 75% Step Load Change (Channel 1: Vo, Channel 4: Io)

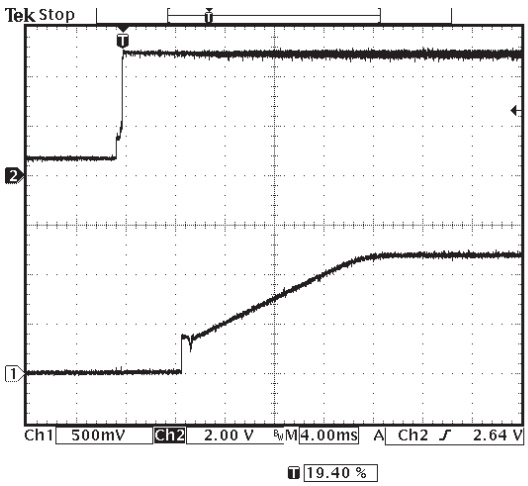


Figure 6: Typical Power-up Characteristic (Channel 1: Vo, Channel 2: Vin)

S1V2 Model

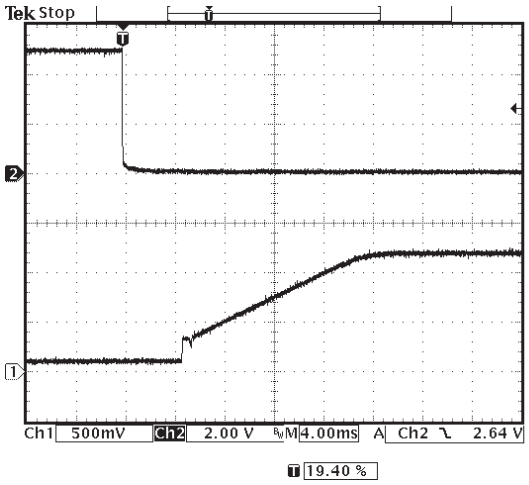


Figure 7: Control On/Off Characteristic
(Channel 1: Vo, Channel 2: Remote ON/OFF)

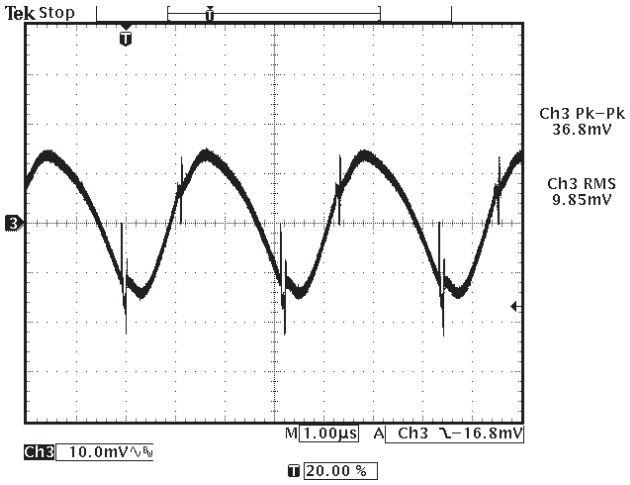


Figure 8: Typical Ripple and Noise
(Channel 3: Vo)

S1V5 Model

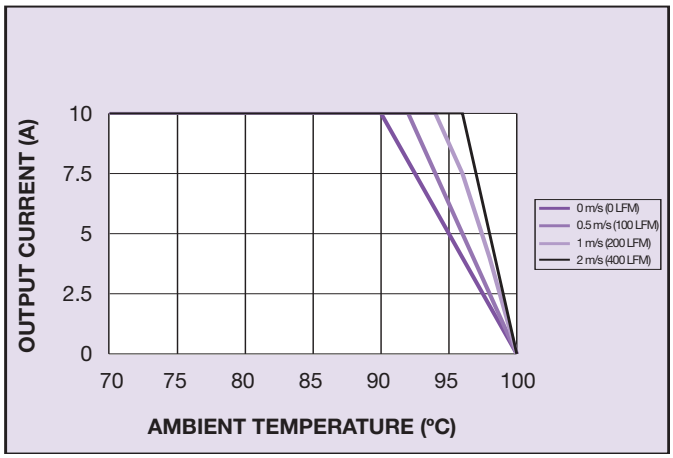


Figure 9: Derating Curve with V_{in} = 5V and V_{out} = 1.5V

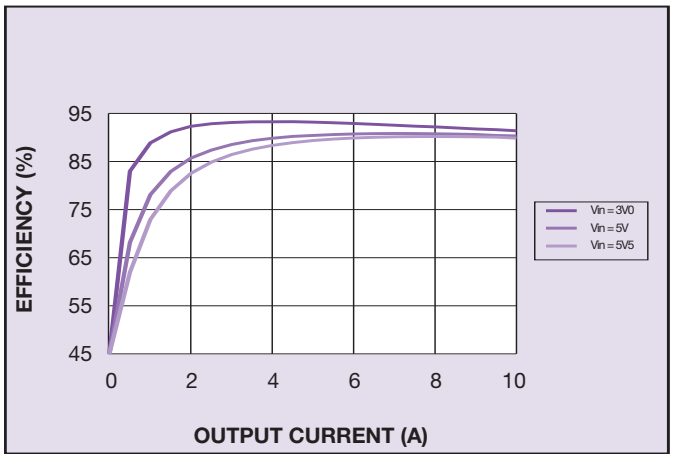


Figure 10: Efficiency vs Load

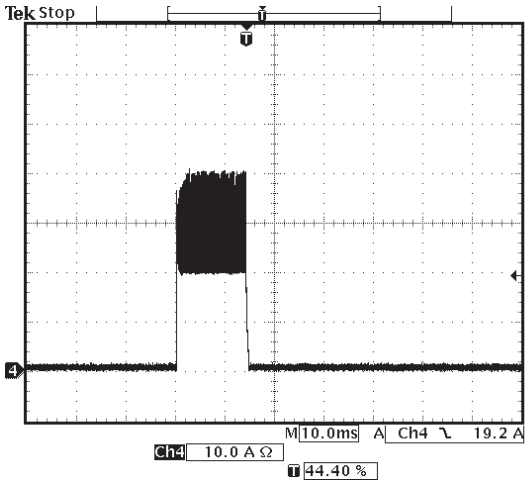


Figure 11: Short Circuit Characteristic (Channel 1: Is/c)

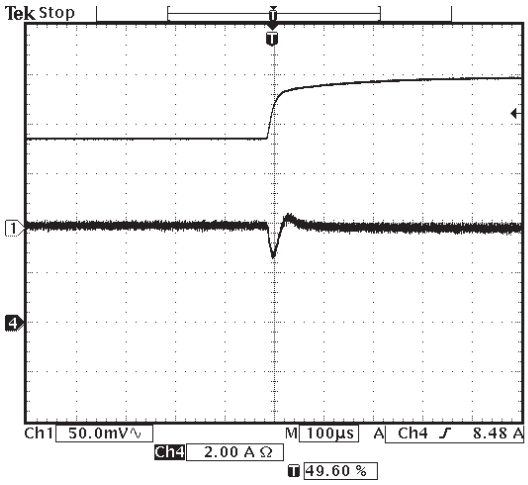


Figure 12: Typical Transient Response 75% - 100% Step Load Change (Channel 1: Vo, Channel 4: Io)

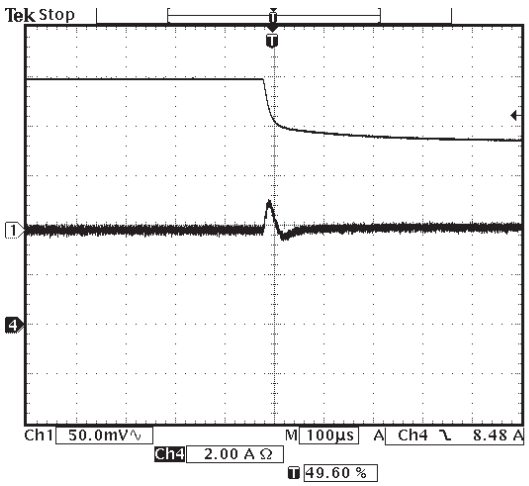


Figure 13: Typical Transient Response 100% - 75% Step Load Change (Channel 1: Vo, Channel 4: Io)

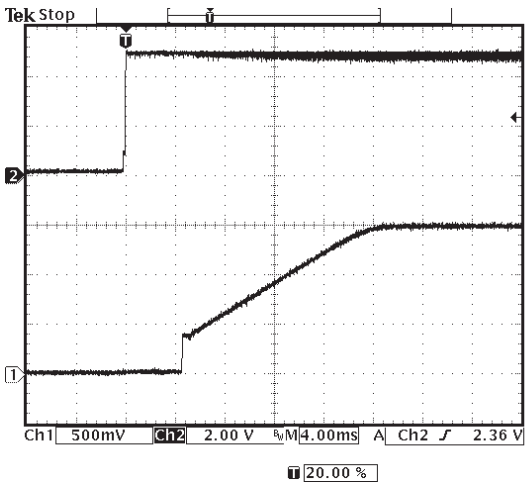


Figure 14: Typical Power-up Characteristic (Channel 1: Vo, Channel 2: Vin)

S1V5 Model

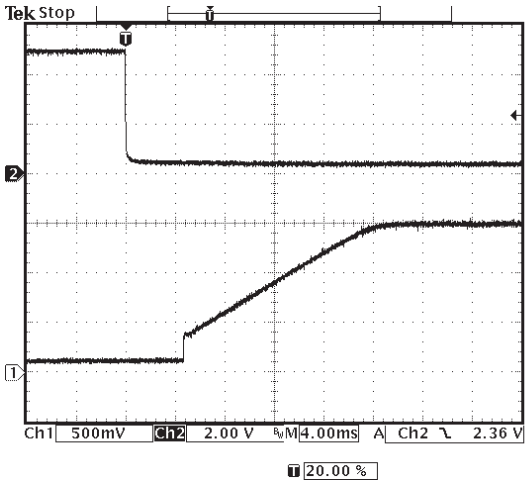


Figure 15: Control On/Off Characteristic (Channel 1: Vo, Channel 2: Remote ON/OFF)

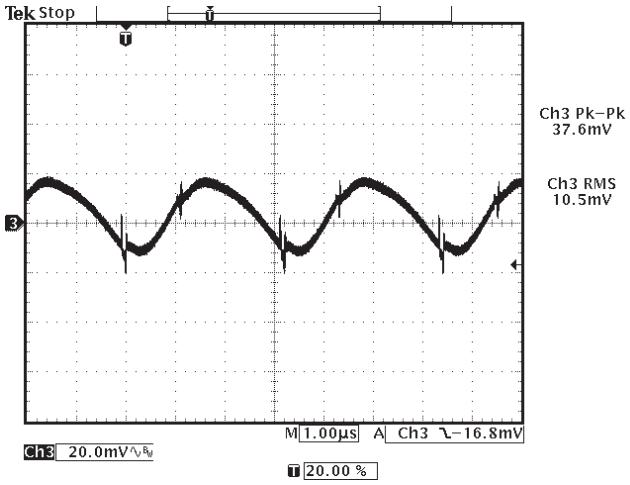


Figure 16: Typical Ripple and Noise (Channel 3: Vo)

S1V8 Model

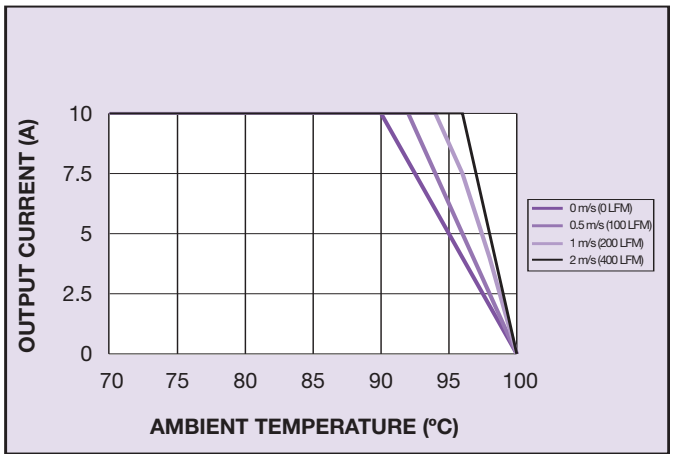


Figure 17: Derating Curve with V_{in} = 5V and V_{out} = 1.8

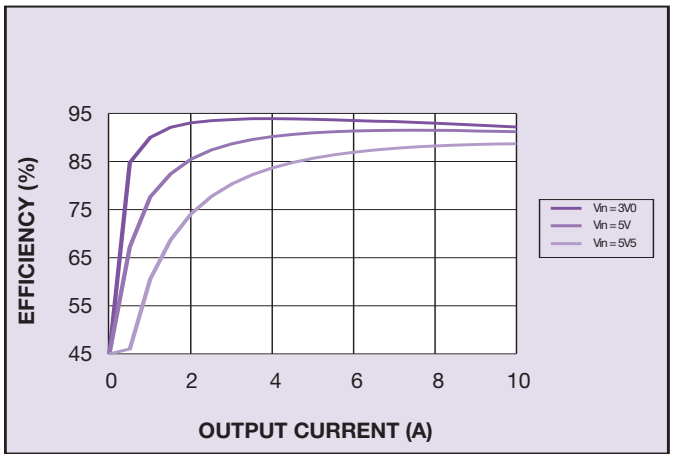


Figure 18: Efficiency vs Load

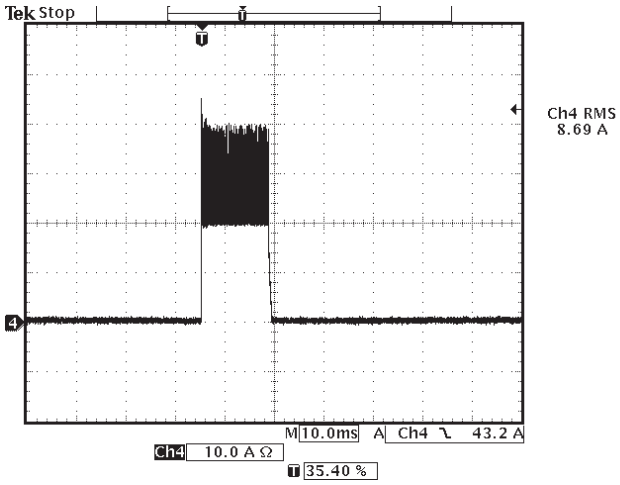


Figure 19: Short Circuit Characteristic (Channel 1: Is/c)

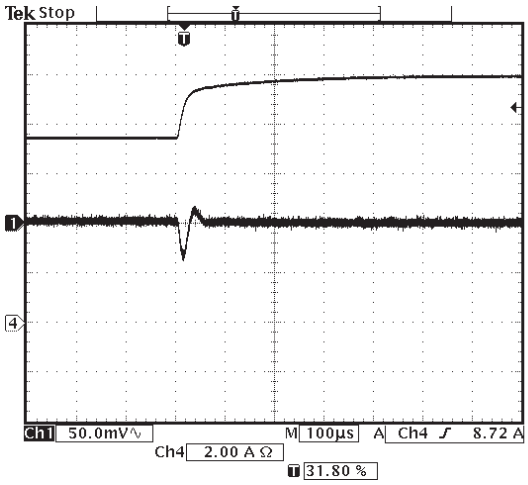


Figure 20: Typical Transient Response 75% - 100% Step Load Change (Channel 1: Vo, Channel 4: Io)

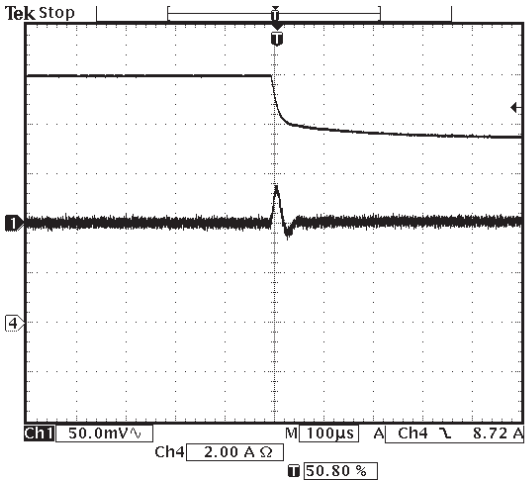


Figure 21: Typical Transient Response 100% - 75% Step Load Change (Channel 1: Vo, Channel 4: Io)

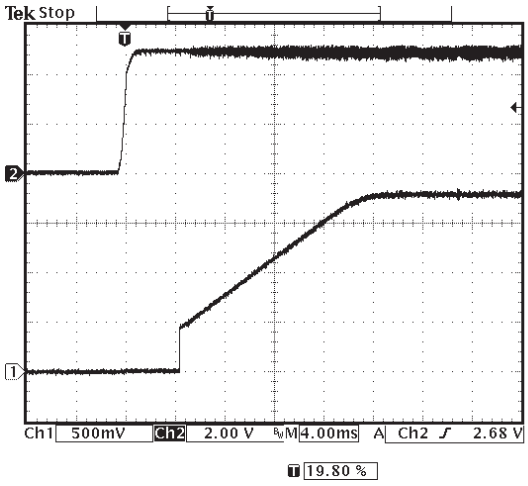


Figure 22: Typical Power-up Characteristic (Channel 1: Vo, Channel 2: Vin)

S1V8 Model

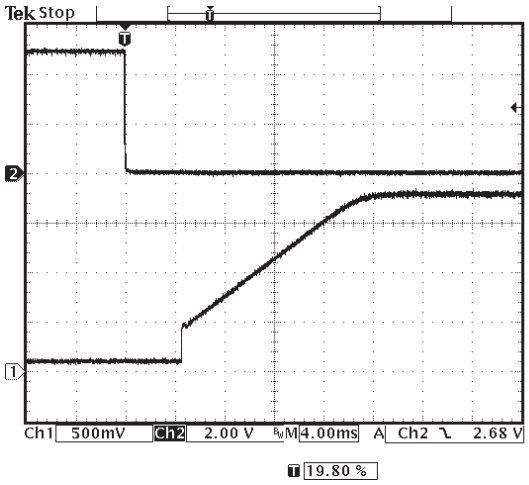


Figure 23: Control On/Off Characteristic (Channel 1: Vo, Channel 2: Remote ON/OFF)

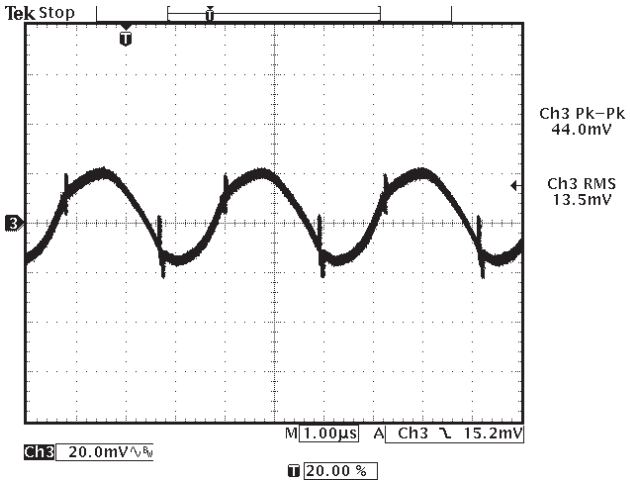


Figure 24: Typical Ripple and Noise (Channel 3: Vo)

S2V5 Model

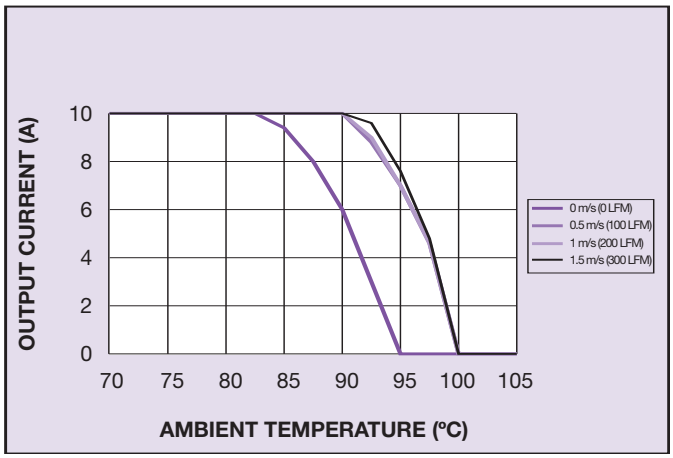


Figure 25: Derating Curve with V_{in} = 5V and V_{out} = 2.5V

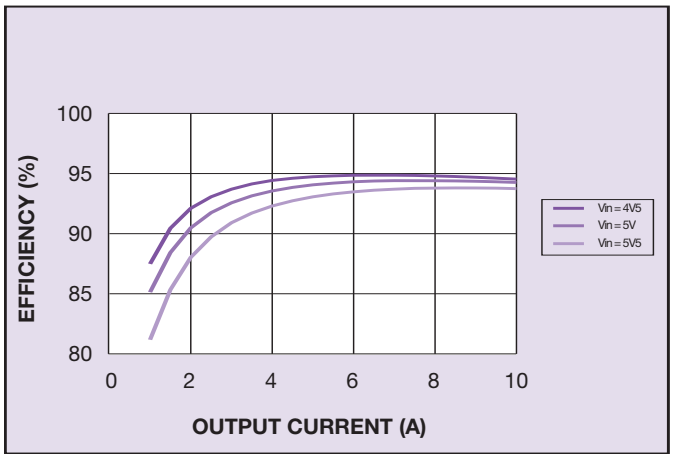


Figure 26: Efficiency vs Load

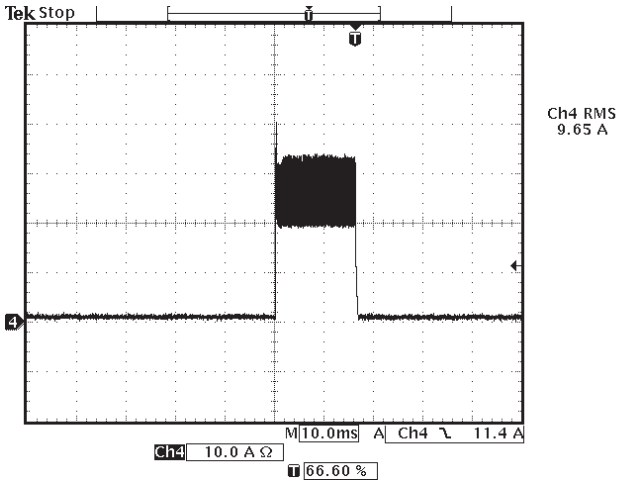


Figure 27: Short Circuit Characteristic (Channel 1: Is/c)

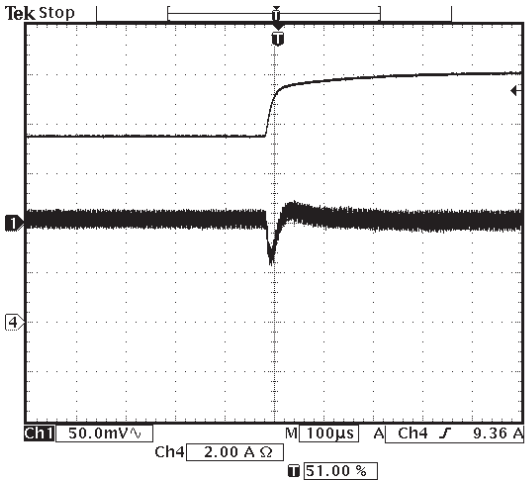


Figure 28: Typical Transient Response 75% - 100% Step Load Change (Channel 1: Vo, Channel 4: Io)

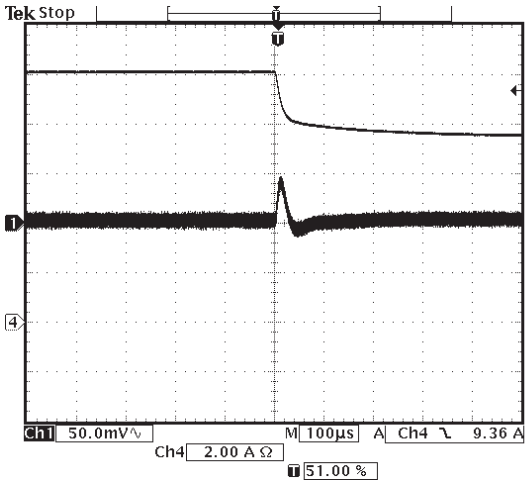


Figure 29: Typical Transient Response 100% - 75% Step Load Change (Channel 1: Vo, Channel 4: Io)

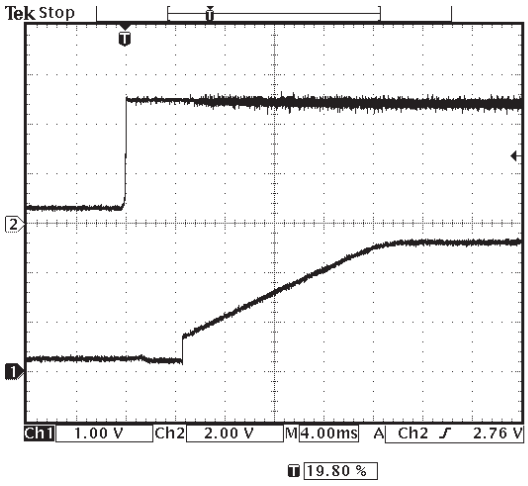


Figure 30: Typical Power-up Characteristic (Channel 1: Vo, Channel 2: Vin)

S2V5 Model

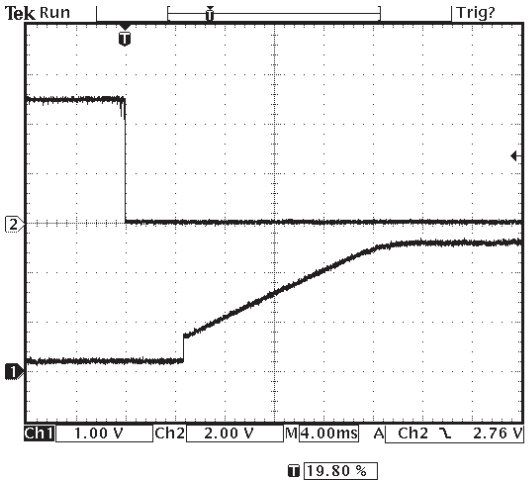


Figure 31: Control On/Off Characteristic
(Channel 1: Vo, Channel 2: Remote ON/OFF)

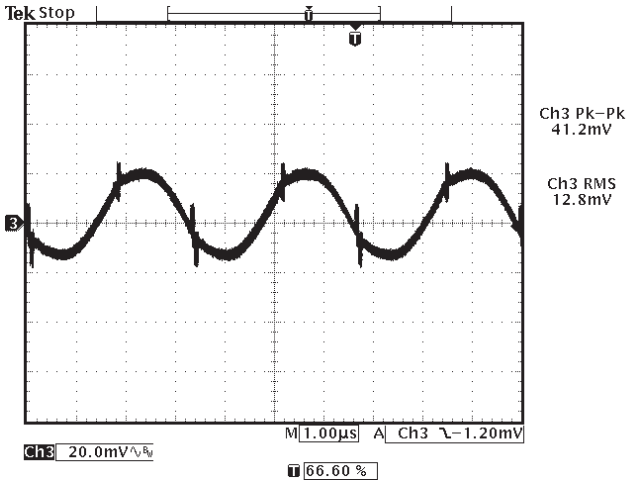


Figure 32: Typical Ripple and Noise
(Channel 3: Vo)

S3V3 Model

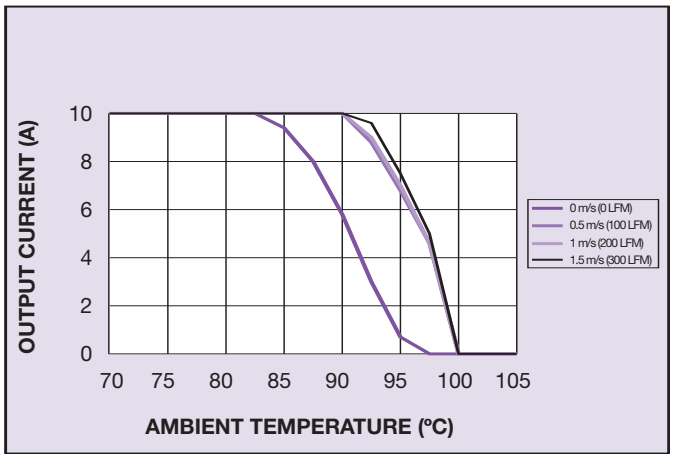


Figure 33: Derating Curve with V_{in} = 5V and V_{out} = 3.3V

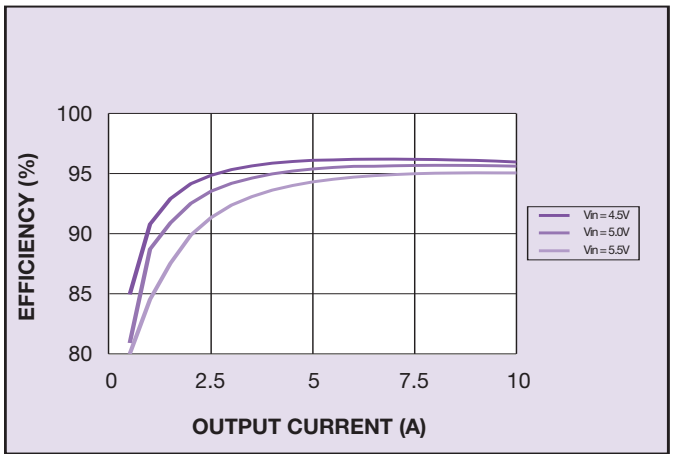


Figure 34: Efficiency vs Load

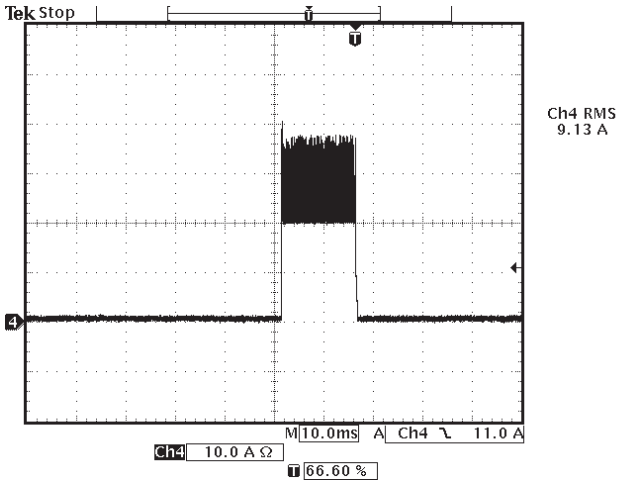


Figure 35: Short Circuit Characteristic (Channel 4: Io)

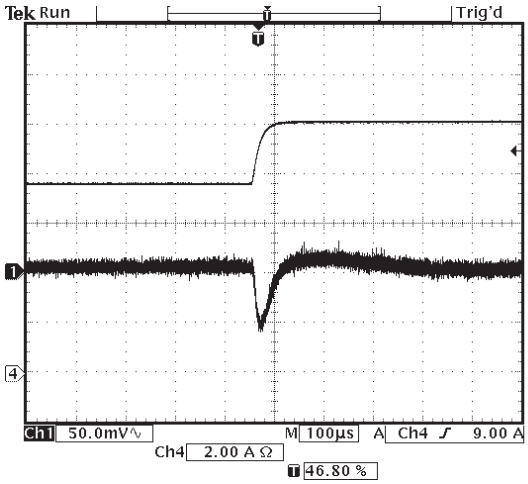


Figure 36: Typical Transient Response 75% - 100% Step Load Change (Channel 1: Vo, Channel 4: Io)

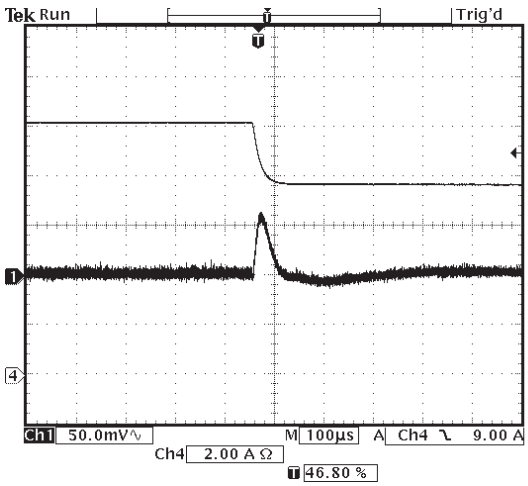


Figure 37: Typical Transient Response 100% - 75% Step Load Change (Channel 1: Vo, Channel 4: Io)

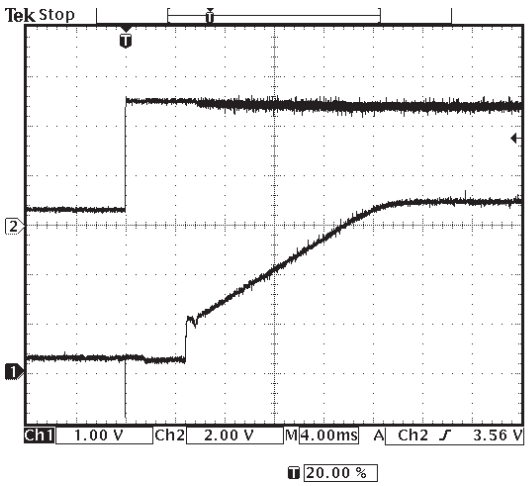


Figure 38: Typical Power-up Characteristic (Channel 1: Vo, Channel 2: Vin)

S3V3 Model

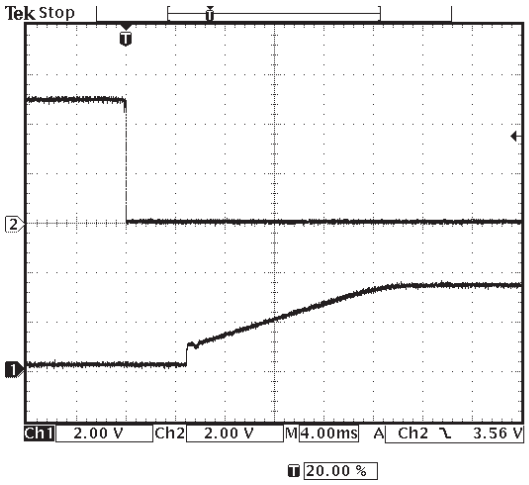


Figure 39: Control On/Off Characteristic (Channel 1: Vo, Channel 2: Remote ON/OFF)

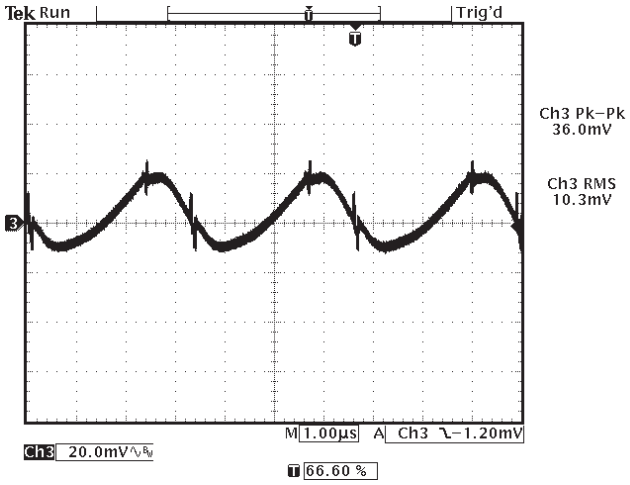


Figure 40: Typical Ripple and Noise (Channel 3: Vo)

W3V3 Model

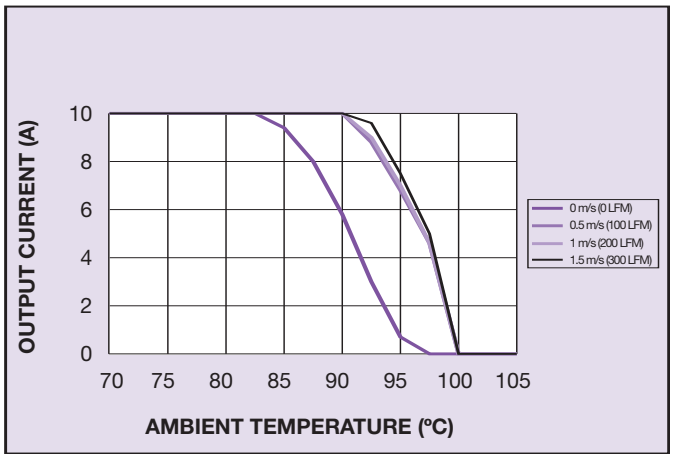


Figure 41: Derating Curve with V_{in} = 5V and V_{out} = 3.3V

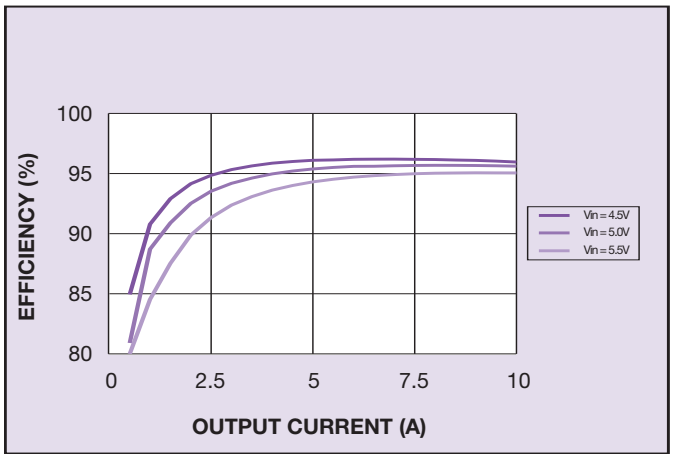


Figure 42: Efficiency vs Load

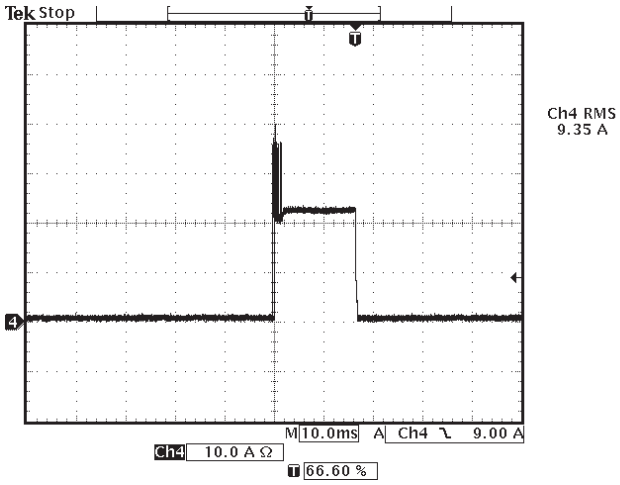


Figure 43: Short Circuit Characteristic (Channel 4: Io)

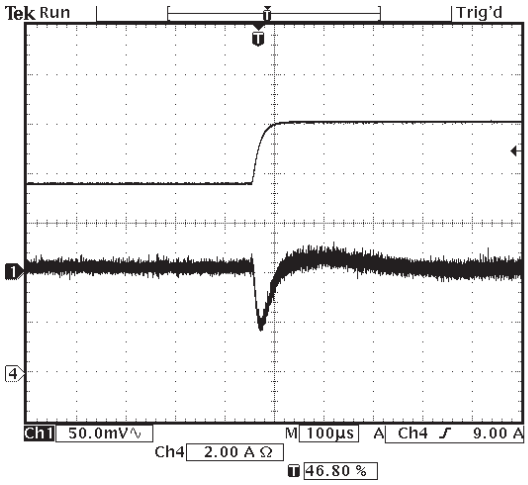


Figure 44: Typical Transient Response 75% - 100% Step Load Change (Channel 1: Vo, Channel 4: Io)

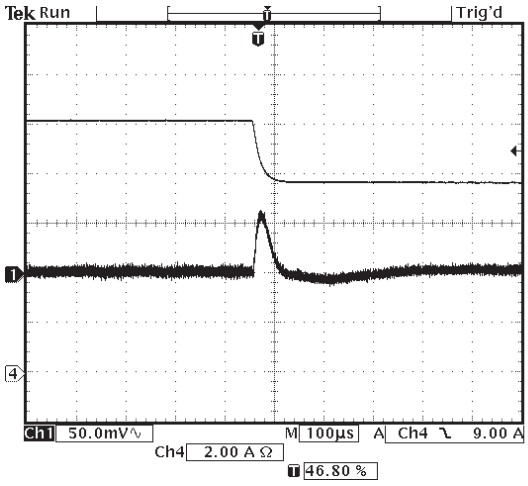


Figure 45: Typical Transient Response 100% - 75% Step Load Change (Channel 1: Vo, Channel 4: Io)

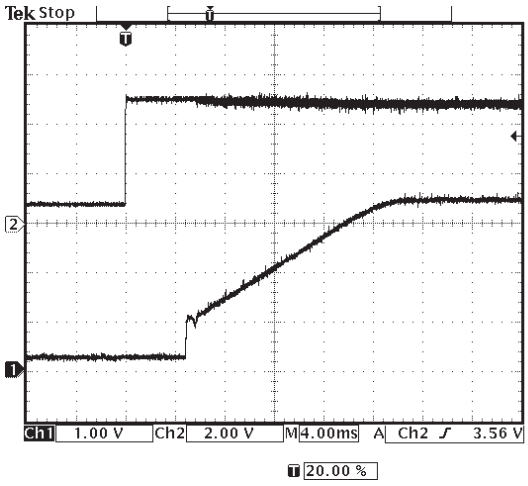


Figure 46: Typical Power-up Characteristic (Channel 1: Vo, Channel 2: Vin)

WV3 Model

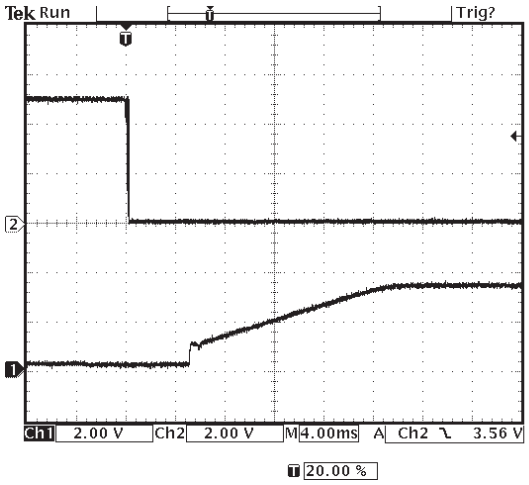


Figure 47: Control On/Off Characteristic (Channel 1: Vo, Channel 2: Remote ON/OFF)

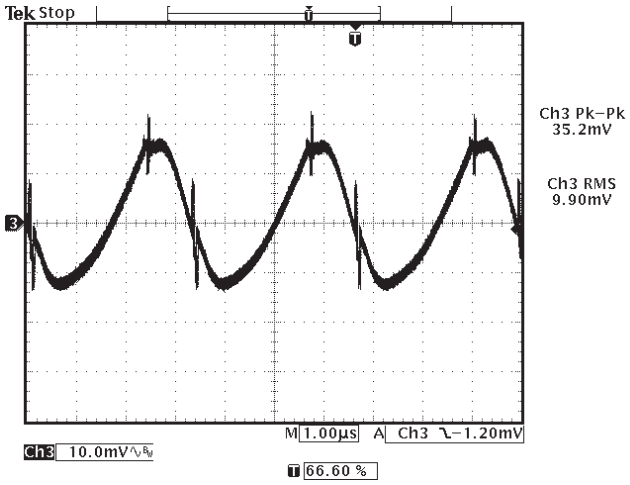
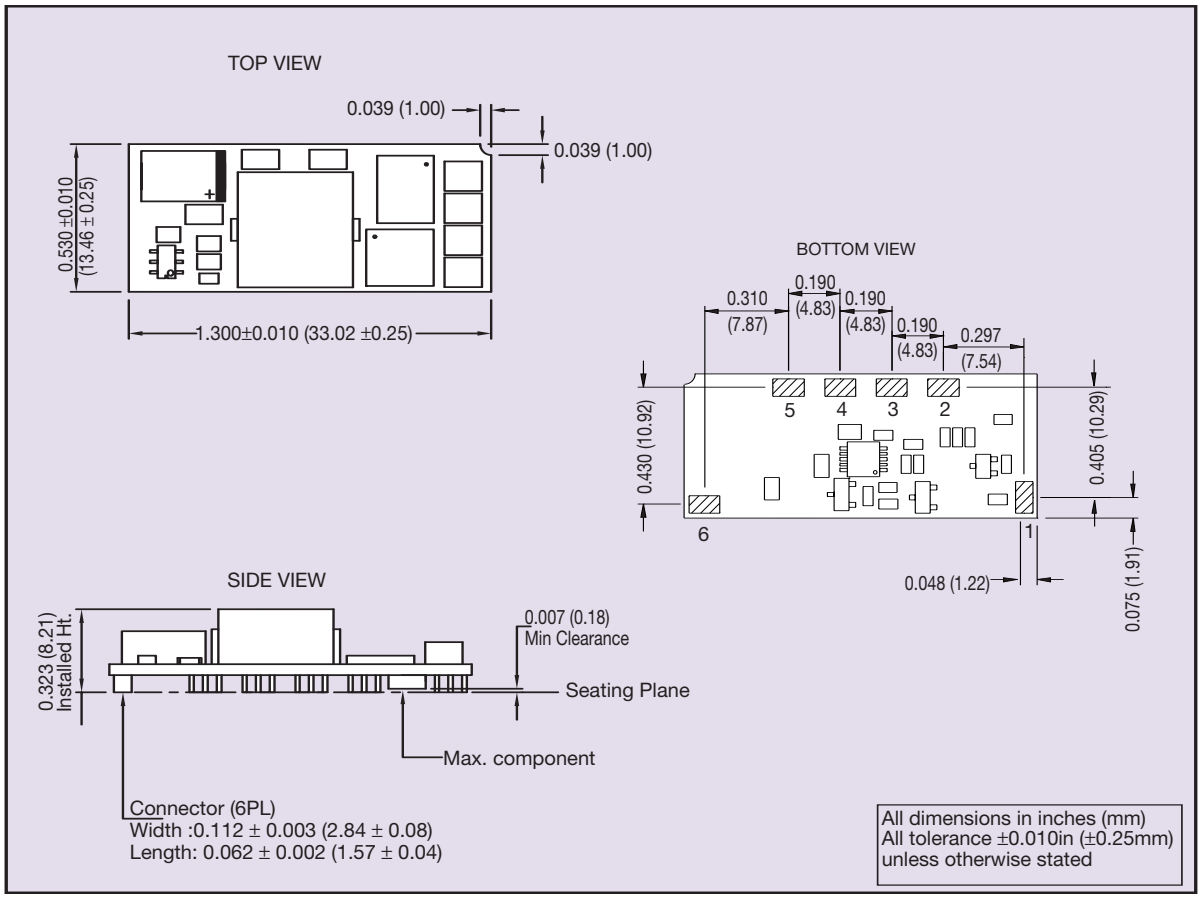


Figure 48: Typical Ripple and Noise (Channel 3: Vo)



Pin Connections

Pin No.	*Function*
1	Remote ON/OFF
2	Remote Sense +
3	Trim
4	+Vout
5	Ground
6	+Vin

Figure 49: Mechanical Drawing and Pinout Table

Note 1

Thermal reference is defined as the highest temperature measured at any one of the specified thermal reference points. See Figure 50: Thermal reference points.

Note 2

The Remote ON/OFF pin is referenced to ground.

Note 3

The SMT10E features a 'Negative Logic' Remote ON/OFF operation. If not using the Remote ON/OFF pin, leave the pin open (the converter will be on). The Remote ON/OFF pin is referenced to ground.

The following conditions apply for the SMT10E:

Configuration	Converter Operation
Remote pin open circuit	Unit is ON
Remote pin pulled low	Unit is ON
Remote pin pulled high [Von/off >1.2V]	Unit is OFF

A 'Positive Logic' Remote ON/OFF version is also possible with this converter. To order please place the suffix '-R' at the end of the model number, e.g. SMT10E-05W3V3-RJ.

Note 4

Thermal reference set up: Unit mounted on an edge card test board 203mm x 190mm. Test board mounted vertically. For test details and recommended set-up see Application Note 168.

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.

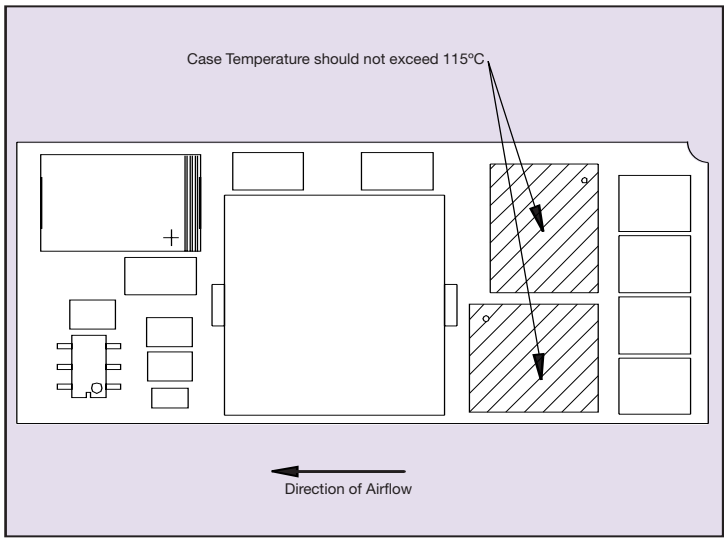


Figure 50: Thermal Reference Points

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