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		75	Vdc	$V_{in(+)}$ - $V_{in(-)}$
Input voltage - peak/surge	V_{in} (peak)	-0.3		100	Vdc	Peaks of any duration, converter OFF above 80 V, non-latching, unit ON once V_{in} <75 V
Input voltage - remote pin	V_{rem} (peak)	-0.3		75	Vdc	Peaks of any duration
Operating temperature	T_{op}	-40		100	˚C	Measured at baseplate
Storage temperature	$T_{storage}$	-40		125	˚C	
Output power (12 V)	Pout (max)			100	W	
Output power (5 V)	P_{out} (max)			100	W	
Output power (3.3 V)	Pout (max)			82.5	W	
Output power (2.5 V)	P_{out} (max)			75	W	
Output power (1.8 V)	Pout (max)			54	W	
Output power (1.5 V)	P_{out} (max)			45	W	
Output power (1.2 V)	Pout (max)			36	W	

All specifications are typical at nominal input Vin = 48 V, full rated load at 25 ˚C unless otherwise specified.

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input voltage - operating	V_{in} (oper)	33	48	75	Vdc	
Input current - no load (1.2 V)	I_{in}		35	60	mAdc	V_{in} (min) - V_{in} (max), enabled
Input current - no load (1.5 V)	I_{in}		45	65	mAdc	V_{in} (min) - V_{in} (max), enabled
Input current - no load (1.8 V)	I_{in}		60	70	mAdc	V_{in} (min) - V_{in} (max), enabled
Input current - no load (2.5 V)	I_{in}		60	75	mAdc	V_{in} (min) - V_{in} (max), enabled
Input current - no load (3.3 V)	I_{in}		65	80	mAdc	V_{in} (min) - V_{in} (max), enabled
Input current - no load (5 V)	I_{in}		70	88	mAdc	V_{in} (min) - V_{in} (max), enabled
Input current - no load (12 V)	I_{in}		65	85	mAdc	V_{in} (min) - V_{in} (max), enabled
Input current - Quiescent	I_{in} (off)		13	20	m Adc	Converter disabled
Input voltage variation	dv/dt			5	V/ms	Complies with ETS300 132 Part 4.4
Inrush current (i^2t)	Iinrush		0.022		A^2s	Complies with ETS300 132 Part 4.7, with recommended LISN and recommended external bypass capacitor
Inrush current ratio	I_t/I_m		11.7			Complies with ETS300 132 Part 4.7, with recommended LISN and recommended external bypass capacitor
Input ripple rejection			50		dB	Frequency <1 kHz
Input fuse				5	A	Slow Blow/Antisurge HRC recommended 200 V Rating. See Application Note 118

Turn On/Off

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input voltage - turn on	$V_{in\ (on)}$	30	32.5	34	Vdc	
Input voltage - turn off	$V_{in\ (off)}$	29	30.5	33	Vdc	
Hysteresis			2.5		Vdc	
Turn on delay - enabled, then power applied	T_{delay} (power)		6	10	ms	With the Remote ON/OFF signal asserted, time from when V_{in} > V_{in} (oper) until Vout is within total regulation band
Turn on delay - power applied, then enabled	T_{delay} (enable)		2	5	ms	With $V_{in} = V_{in\ (nom)}$, then Remote ON/OFF asserted, time until Vo is within total error band
Rise time	T_{rise}		1	2	ms	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 ON/OFF pin Open collector or equivalent compatible						See Notes 1 and 2
Control pin open circuit voltage	V_{ih}		4.5	5.0	V	I_{ih} = 0 µA; open circuit voltage
High level input voltage	V_{ih}	4.0			V	Converter guaranteed ON when control pin is greater than V_{ih} (min)
High level input current	I_{ih}			10	µA	Current flowing into control pin when pin is pulled high (max. at V_{ih} = 75 V)
Acceptable high level leakage current	I_{ih} (leakage)			-10	µA	Acceptable leakage current from signal pin into the open collector driver (neg = from converter)
Low level input voltage	V_{il}	-0.3		1.2	V	Converter guaranteed off when control pin is less than V_{il} (max)
Low level input current	I_{il}		-0.2	-0.4	mA	V_{il} = 0.4 V
Low level input current	I_{il} (max)		-0.2	-0.4	mA	V_{il} = 0.0 V, maximum source current from converter with short circuit

Common Protection/Control

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overtemperature shutdown threshold	Tots	110	115	120	˚C	Baseplate temperature, non-latching shutdown protection
Overtemperature shutdown - restart hysteresis			5		˚C	
Remote sense compensation				10	%	% of Vo (nom), compensation includes trim. See Application Note 118

Reliability and Service Life

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Mean time between failure	MTBF	2,284,281			Hours	Telcordia SR-332 V_{in} = $V_{in\ (nom)}$; I_{out} = $I_{out\ (max)}$; ambient 25 ˚C; ground benign environment
HALT testing						Completed
Asynchronous dynamic testing						Completed

Isolation

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input to output test voltage				1500	Vdc	Test duration 1 s
Input to output capacitance			2000		pF	
Input to output resistance		100			MΩ	Measured with 500 Vdc
Input to output insulation system			Operational			

Other Specifications

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Switching frequency	f_{sw}	340	400	460	kHz	Fixed frequency (all models)
Weight			45	48	g	Statistical weight data available

Environmental Requirements

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Thermal performance		-40		100	˚C	Baseplate temperature
Altitude				3000	m	Derate total max. output current by 20%
				9843	ft	Derate total max. output current by 20%
				10000	m	Derate total max. output current by 50%
				32808	ft	Derate total max. output current by 50%

Type	Parameter	Reference	Test Level	Notes and Conditions
Air temperature	Low	IEC 68-2-1	-40 ˚C	All characteristics and parameters
	High	IEC 68-2-2	+70 ˚C	extracted from ETS 300 019
	Change	IEC 68-2-14	-40 ˚C to +70 ˚C	classes 3.1, 3.2, 3.3, 3.4 and 3.5
				$T_{max.}$ = +65 ˚C for T3.4
Relative humidity	Low		10%	
	High	IEC 68-2-56	100%	
	Condensation	IEC 68-2-30	90% to 100%	
Vibration IEC class 3M5	Freq. velocity	IEC 68-2-6	5-9 Hz 5 mm/s	
	Freq. acceleration	IEC 68-2-6	9-200 Hz 1 g	
Shocks IEC class 3M5	Acceleration	IEC 68-2-29	10 g	

Referenced ETSI standards:

ETS 300 019: Environmental conditions and environmental tests for telecommunications equipment
ETS 300 019: Part 1-3 (1997) Classification of environmental conditions stationary use at weather protected locations
ETS 300 019: Part 2-3 (1997) Specification of environmental tests stationary use at weather protected locations

EMC Electromagnetic Compatibility

Phenomenon	Port	Standard	Test level	Criteria	Notes and conditions
Immunity:					
ESD	Enclosure	EN61000-4-2	6 kV contact	NP	As per ETS 300 386-1 table 5
			8 kV air	RP	
EFT	DC power	EN61000-4-4	2 kV	NP	As per ETS 300 386-1 table 5
			4 kV	LFS	
	Signal	EN61000-4-4	1 kV	NP	See Application Note 118
			2 kV	LFS	See Application Note 118
Radiated field	Enclosure	EN61000-4-3	10 V/m	NP	As per ETS 300 386-1 table 5
Conducted	Dc power	EN61000-4-6	10 V	NP	As per ETS 300 386-1 table 5
	Signal	EN61000-4-6	10 V	NP	See Application Note 118
Input transients	DC power	ETS 300 132 ETR 283			

EMC Electromagnetic Compatibility

Phenomenon	Port	Standard	Test level	Criteria	Notes and conditions
Emission:					
Conducted	DC power	EN55022	Level A		With recommended external filter for compliance bandwidth 20 kHz to 30 MHz, as per ETS 300 386-1
			EN55022	Level B	With recommended external filter for compliance bandwidth 20 kHz to 30 MHz, as per ETS 300 386-1
	Signal	EN55022	TBD		Bandwidth 150 kHz to 30MHz, as per ETS 300 386-1
Radiated		EN55022	TBD		Bandwidth 30 MHz to 1 GHz, as per ETS 300 386-1

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

Standards Compliance List

Characteristic	
EN60950 UL/cUL 1950 TÜV Rheinland	3rd edition

Safety Agency Approvals

Standard	Category
UL/cUL 1950 File Number	E135734
TÜV Rheinland Certificate No.	R72050216

Material Ratings

Characteristic - Signal Name	Notes and Conditions
Flammability rating	UL94V-0
Material type	FR4 PCB, T - LAM IMS - Baseplate

Model Numbers

Model Number	Input Voltage	Output Voltage	Overvoltage Protection	Output Current (Max.)	Typical Efficiency
EXQ125-48S1V2J	33-75 Vdc	1.2 V	1.45 V	30 A	86.5%
EXQ125-48S1V5J	33-75 Vdc	1.5 V	1.8 V	30 A	87.5%
EXQ125-48S1V8J	33-75 Vdc	1.8 V	2.25 V	30 A	88%
EXQ125-48S2V5J	33-75 Vdc	2.5 V	3 V	30 A	90%
EXQ125-48S3V3J	33-75 Vdc	3.3 V	3.9 V	25 A	91%
EXQ125-48S05J	33-75 Vdc	5 V	5.9 V	20 A	92%
EXQ125-48S12J	33-75 Vdc	12 V	14.4 V	8.3 A	93%

EXQ125-48S1V2J Model
Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		0.87	0.89	Adc	$V_{in} = V_{in\,(nom)}$; $I_{out} = I_{out\,(max)}$; $V_O = V_{O\,(nom)}$
Input current - maximum	$I_{in\,(max.)}$		1.28	1.30	Adc	$V_{in} = V_{in\,(min)}$; $I_{out} = I_{out\,(max)}$; $V_O = V_{O\,(nom)}$, measured at converter
Input Capacitor ripple current	$I_{in\,(ripple)}$		50 130		mA rms mA pk-pk	$I_{out} = I_{out\,(max)}$, measured without standard filter. See Application Note 118
Reflected ripple current	$I_{in\,(refl)}$		2 5.5		mA rms mA pk-pk	$I_{out} = I_{out\,(max)}$, measured with standard filter. See Application Note 118
Input capacitance - Internal	C_{input}	2.4	3	5.4	µF	Internal to converter
Input capacitance - External bypass	C_{bypass}		33		µF	Recommended customer added capacitance <0.7 Ohm ESR

EXQ125-48S1V2J Model
Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	1.182	1.200	1.218	Vdc	$V_{in} = V_{in\,(nom)}$; $I_{out} = I_{out\,(nom)}$
Total regulation band	V_O	1.164		1.236	Vdc	For all line, static load and temperature until end of life.
Line regulation			0.01	0.1	%	$I_{out} = I_{out}$ (nom), V_{in} (min) to V_{in} (max)
Load regulation			0.02	0.2	%	$V_{in} = V_{in}$ (nom), I_{out} (min) to I_{out} (max)
Temperature regulation			0.002	0.02	±%/˚C	$V_{in} = V_{in}$ (nom), $I_{out} = I_{out\,(max)}$
Output current continuous	Iout	0		30	Adc	
Output current - short circuit	I_{sc}	32	35	38	A rms	Continuous, unit auto recovers from short, V_O < 100 mV
Load transient response - peak deviation	$V_{dynamic}$/ Vo (nom)		6		%	Peak deviation for 50% to 75% step load, di/dt = 100 mA/µs, % of Vo (nom)
Load transient response - recovery	$T_{recovery}$		100	150	µs	Settling time to within 1% of output set point voltage for 50% to 75% load step
External load capacitance	C_{ext}	0		10,000	µF	Higher load capacitance values may be possible. Contact Artesyn Technologies for details
Output voltage - noise	V_{p-p} V_{rms}		45 15	60 20	mV pk-pk mV rms	Measurement bandwidth 20 MHz See Application Note 118 for test set-up

EXQ125-48S1V2J Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overvoltage clamp voltage	V_{OV}	1.35		1.55	Vdc	Non-latching. See Application Note 118 for details
Overcurrent limit inception	I_{OC}	32	35	38	Adc	V_O = 90% of V_O (nom)
Output voltage trim range		 90		110	% %	Trim up (% of $V_{O\ nom}$) Trim down (% of $V_{O\ nom}$) See Application Note 118 for details of trim equations and trim curves
Open sense voltage		1.15	1.20	1.30	Vdc	

EXQ125-48S1V2J Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	h	85	86.5		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	h	85.5	86.5		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

EXQ125-48S1V5J Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		1.28	1.31	Adc	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max); $V_o = V_o$ (nom)
Input current - maximum	I_{in} (max.)		1.07	1.09	Adc	$V_{in} = V_{in}$ (min); $I_{out} = I_{out}$ (max); $V_o = V_o$ (nom), measured at converter
Input Capacitor ripple current	I_{in} (ripple)		70 200		mA rms mA pk-pk	$I_{out} = I_{out}$ (max), measured without standard filter. See Application Note 118
Reflected ripple current	I_{in} (refl)		2 5.5		mA rms mA pk-pk	$I_{out} = I_{out}$ (max), measured with standard filter. See Application Note 118
Input capacitance - Internal	C_{input}	2.4	3	5.4	µF	Internal to converter
Input capacitance - External bypass	C_{bypass}		33		µF	Recommended customer added capacitance

EXQ125-48S1V5J Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	1.477	1.500	1.523	Vdc	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	1.455		1.545	Vdc	For all line, static load and temperature until end of life
Line regulation			0.01	0.1	%	$I_{out} = I_{out}$ (nom), V_{in} (min) to V_{in} (max)
Load regulation			0.02	0.2	%	$V_{in} = V_{in}$ (nom), I_{out} (min) to I_{out} (max)
Temperature regulation			0.002	0.02	±%/˚C	$V_{in} = V_{in}$ (nom), $I_{out} = I_{out}$ (max)
Output current continuous	Iout	0		30	Adc	
Output current - short circuit	I_{sc}	32	35	38	A rms	Continuous, unit auto recovers from short, V_o < 100 mV
Load transient response - peak deviation	$V_{dynamic}$/ Vo (nom)		5		%	Peak deviation for 50% to 75% step load, di/dt = 100 mA/µs, % of Vo (nom)
Load transient response - recovery	$T_{recovery}$		100	150	µs	Settling time to within 1% of output set point voltage for 50% to 75% load step
External load capacitance	C_{ext}	0		10,000	µF	Higher load capacitance values may be possible. Contact Artesyn Technologies for details
Output voltage - noise	V_{p-p} V_{rms}		45 15	60 20	mV pk-pk mV rms	Measurement bandwidth 20 MHz See Application Note 118 for test set-up

EXQ125-48S1V5J Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overvoltage clamp voltage	V_{OV}	1.70		1.95	Vdc	Non-latching. See Application Note 118 for details
Overcurrent limit inception	I_{OC}	32	35	38	Adc	V_O = 90% of V_O (nom)
Output voltage trim range				110	%	Trim up (% of $V_{O\ nom}$)
		90			%	Trim down (% of $V_{O\ nom}$) See Application Note 118 for details of trim equations and trim curves
Open sense voltage		1.45	1.50	1.55	Vdc	

EXQ125-48S1V5J Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	h	86	87.5		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	h	86	87.5		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

EXQ125-48S1V8J Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		1.28	1.31	Adc	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max); $V_o = V_o$ (nom)
Input current - maximum	I_{in} (max.)		1.89	1.92	Adc	$V_{in} = V_{in}$ (min); $I_{out} = I_{out}$ (max); $V_o = V_o$ (nom), measured at converter
Input Capacitor ripple current	I_{in} (ripple)		70 200		mA rms mA pk-pk	$I_{out} = I_{out}$ (max), measured without standard filter. See Application Note 118
Reflected ripple current	I_{in} (refl)		2 5.5		mA rms mA pk-pk	$I_{out} = I_{out}$ (max), measured with standard filter. See Application Note 118
Input capacitance - Internal	C_{input}	2.4	3	5.4	µF	Internal to converter
Input capacitance - External bypass	C_{bypass}		33		µF	Recommended customer added capacitance

EXQ125-48S1V8J Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	1.773	1.800	1.827	Vdc	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	1.746		1.854	Vdc	For all line, static load and temperature until end of life
Line regulation			0.01	0.1	%	$I_{out} = I_{out}$ (nom), V_{in} (min) to V_{in} (max)
Load regulation			0.02	0.2	%	$V_{in} = V_{in}$ (nom), I_{out} (min) to I_{out} (max)
Temperature regulation			0.002	0.02	±%/˚C	$V_{in} = V_{in}$ (nom), $I_{out} = I_{out}$ (max)
Output current continuous	Iout	0		30	Adc	
Output current - short circuit	I_{sc}	32	35	38	A rms	Continuous, unit auto recovers from short, V_o < 100 mV
Load transient response - peak deviation	$V_{dynamic}$/ Vo (nom)		3		%	Peak deviation for 50% to 75% step load, di/dt = 100 mA/µs, % of Vo (nom)
Load transient response - recovery	$T_{recovery}$		100	150	µs	Settling time to within 1% of output set point voltage for 50% to 75% load step
External load capacitance	C_{ext}	0		10,000	µF	Higher load capacitance values may be possible. Contact Artesyn Technologies for details
Output voltage - noise	V_{p-p} V_{rms}		45 15	60 20	mV pk-pk mV rms	Measurement bandwidth 20 MHz See Application Note 118 for test set-up

EXQ125-48S1V8J Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overvoltage clamp voltage	V_{OV}	2.0		2.3	Vdc	Non-latching. See Application Note 118 for details
Overcurrent limit inception	I_{OC}	32	35	38	Adc	V_O = 90% of V_O (nom)
Output voltage trim range				110	%	Trim up (% of $V_{O\ nom}$)
		90			%	Trim down (% of $V_{O\ nom}$) See Application Note 118 for details of trim equations and trim curves
Open sense voltage		1.77	1.83	1.89	Vdc	

EXQ125-48S1V8J Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	h	86.5	88		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	h	87	88		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

EXQ125-48S2V5J Model
Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		1.75	1.78	Adc	$V_{in} = V_{in\ (nom)}$; $I_{out} = I_{out\ (max)}$; $V_O = V_{O\ (nom)}$
Input current - maximum	$I_{in\ (max.)}$		2.57	2.60	Adc	$V_{in} = V_{in\ (min)}$; $I_{out} = I_{out\ (max)}$; $V_O = V_{O\ (nom)}$ (measured at converter)
Input Capacitor ripple current	$I_{in\ (ripple)}$		90 250		mA rms mA pk-pk	$I_{out} = I_{out\ (max)}$, measured without standard filter. See Application Note 118
Reflected ripple current	$I_{in\ (refl)}$		3 7		mA rms mA pk-pk	$I_{out} = I_{out\ (max)}$, measured with standard filter. See Application Note 118
Input capacitance - Internal	C_{input}	2.4	3	5.4	µF	Internal to converter
Input capacitance - External bypass	C_{bypass}		33		µF	Recommended customer added capacitance

EXQ125-48S2V5J Model
Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	2.462	2.500	2.538	Vdc	$V_{in} = V_{in\ (nom)}$; $I_{out} = I_{out\ (nom)}$
Total regulation band	V_O	2.425		2.575	Vdc	For all line, static load and temperature until end of life
Line regulation			0.01	0.1	%	$I_{out} = I_{out}$ (nom), V_{in} (min) to V_{in} (max)
Load regulation			0.02	0.2	%	$V_{in} = V_{in}$ (nom), I_{out} (min) to I_{out} (max)
Temperature regulation			0.002	0.02	±%/˚C	$V_{in} = V_{in}$ (nom), $I_{out} = I_{out\ (max)}$
Output current continuous	Iout	0		30	Adc	
Output current - short circuit	I_{sc}	32	35	38	A rms	Continuous, unit auto recovers from short, V_O < 100 mV
Load transient response - peak deviation	$V_{dynamic}$/ Vo (nom)		2		%	Peak deviation for 50% to 75% step load, di/dt = 100 mA/µs, % of Vo (nom)
Load transient response - recovery	$T_{recovery}$		100	150	µs	Settling time to within 1% of output set point voltage for 50% to 75% load step
External load capacitance	C_{ext}	0		10,000	µF	Higher load capacitance values may be possible. Contact Artesyn Technologies for details
Output voltage - noise	V_{p-p} V_{rms}		45 15	60 20	mV pk-pk mV rms	Measurement bandwidth 20 MHz See Application Note 118 for test set-up

EXQ125-48S2V5J Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overvoltage clamp voltage	V_{OV}	2.8		3.1	Vdc	Non-latching. See Application Note 118 for details
Overcurrent limit inception	I_{OC}	32	35	38	Adc	V_O = 90% of V_O (nom)
Output voltage trim range		 90		110	% %	Trim up (% of $V_{O\ nom}$) Trim down (% of $V_{O\ nom}$) See Application Note 118 for details of trim equations and trim curves
Open sense voltage		2.50	2.54	2.62	Vdc	

EXQ125-48S2V5J Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	h	89	90		%	I_{out} = 100% Iout (max), V_{in} = V_{in} (nom)
Efficiency	h	89	90		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

EXQ125-48S3V3J Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		1.89	1.92	Adc	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (max); $V_o = V_o$ (nom)
Input current - maximum	I_{in} (max.)		2.78	2.81	Adc	$V_{in} = V_{in}$ (min); $I_{out} = I_{out}$ (max); $V_o = V_o$ (nom) (measured at converter)
Input Capacitor ripple current	I_{in} (ripple)		90 250		mA rms mA pk-pk	$I_{out} = I_{out}$ (max), measured without external Pi filter
Reflected ripple current	I_{in} (refl)		3 7		mA rms mA pk-pk	$I_{out} = I_{out}$ (max), measured with standard filter. See Application Note 118
Input capacitance - Internal	C_{input}	2.4	3	5.4	µF	Internal to converter filter
Input capacitance - External bypass	C_{bypass}		33		µF	Recommended customer added capacitance

EXQ125-48S3V3J Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	3.250	3.300	3.350	Vdc	$V_{in} = V_{in}$ (nom); $I_{out} = I_{out}$ (nom)
Total regulation band	V_o	3.20		3.40	Vdc	For all line, static load and temperature until end of life
Line regulation			0.01	0.1	%	$I_{out} = I_{out}$ (nom), V_{in} (min) to V_{in} (max)
Load regulation			0.02	0.2	%	$V_{in} = V_{in}$ (nom), I_{out} (min) to I_{out} (max)
Temperature regulation			0.002	0.02	±%/˚C	$V_{in} = V_{in}$ (nom), $I_{out} = I_{out}$ (max)
Output current continuous	Iout	0		30	Adc	
Output current - short circuit	I_{sc}	27	29	32	A rms	Continuous, unit auto recovers from short, $V_o < 100$ mV
Load transient response - peak deviation	$V_{dynamic}$/ Vo (nom)		2		%	Peak deviation for 50% to 75% step load, di/dt = 100 mA/µs, % of Vo (nom)
Load transient response - recovery	$T_{recovery}$		100	150	µs	Settling time to within 1% of output set point voltage for 50% to 75% load step
External load capacitance	C_{ext}	0		10,000	µF	Higher load capacitance values may be possible. Contact Artesyn Technologies for details
Output voltage - noise	V_{p-p} V_{rms}		45 15	60 20	mV pk-pk mV rms	Measurement bandwidth 20 MHz See Application Note 118 for test set-up

EXQ125-48S3V3J Model
Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overvoltage clamp voltage	V_{OV}	3.65		4.10	Vdc	Non-latching. See Application Note for details
Overcurrent limit inception	I_{OC}	27	28.5	32	Adc	V_O = 90% of V_O (nom)
Output voltage trim range				110	%	Trim up (% of $V_{O\ nom}$)
		90			%	Trim down (% of $V_{O\ nom}$) See Application Note for details of trim equations and trim curves
Open sense voltage		3.30	3.38	3.45	Vdc	

EXQ125-48S3V3J Model
Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	h	90	91		%	I_{out} = 100% Iout (max), V_{in} = V_{in} (nom)
Efficiency	h	90	91		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

EXQ125-48S05J Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		2.27	2.30	Adc	$V_{in} = V_{in\ (nom)}$; $I_{out} = I_{out\ (max)}$; $V_o = V_{o\ (nom)}$
Input current - maximum	$I_{in\ (max.)}$		3.34	3.38	Adc	$V_{in} = V_{in\ (min)}$; $I_{out} = I_{out\ (max)}$; $V_o = V_{o\ (nom)}$, measured at converter
Input Capacitor ripple current	$I_{in\ (ripple)}$		150 500		mA rms mA pk-pk	$I_{out} = I_{out\ (max)}$, measured without standard filter. See Application Note 118
Reflected ripple current	$I_{in\ (refl)}$		4 8		mA rms mA pk-pk	$I_{out} = I_{out\ (max)}$, measured with standard filter. See Application Note 118
Input capacitance - Internal	C_{input}	2.4	3	5.4	µF	Internal to converter
Input capacitance - External bypass	C_{bypass}		33		µF	Recommended customer added capacitance

EXQ125-48S05J Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	4.925	5.000	5.075	Vdc	$V_{in} = V_{in\ (nom)}$; $I_{out} = I_{out\ (nom)}$
Total regulation band	V_o	4.850		5.150	Vdc	For all line, static load and temperature until end of life
Line regulation			0.01	0.1	%	$I_{out} = I_{out}$ (nom), V_{in} (min) to V_{in} (max)
Load regulation			0.02	0.2	%	$V_{in} = V_{in}$ (nom), I_{out} (min) to I_{out} (max)
Temperature regulation			0.002	0.02	±%/˚C	$V_{in} = V_{in}$ (nom), $I_{out} = I_{out\ (max)}$
Output current continuous	Iout	0		20	Adc	
Output current - short circuit	I_{sc}	22	24	26	A rms	Continuous, unit auto recovers from short, V_o < 100 mV
Load transient response - peak deviation	$V_{dynamic}$/ Vo (nom)		2		%	Peak deviation for 50% to 75% step load, di/dt = 100 mA/µs, % of Vo (nom)
Load transient response - recovery	$T_{recovery}$		100	150	µs	Settling time to within 1% of output set point voltage for 50% to 75% load step
External load capacitance	C_{ext}	0		2,200	µF	Higher load capacitance values may be possible. Contact Artesyn Technologies for details
Output voltage - noise	V_{p-p} V_{rms}		45 15	60 20	mV pk-pk mV rms	Measurement bandwidth 20 MHz See Application Note 118 for test set-up

EXQ125-48S05J Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overvoltage clamp voltage	V_{OV}	5.6		6.1	Vdc	Non-latching. See Application Note 118 for details
Overcurrent limit inception	I_{OC}	22	24	26	Adc	V_O = 90% of V_O (nom)
Output voltage trim range				110	%	Trim up (% of $V_{O\ nom}$)
		90			%	Trim down (% of $V_{O\ nom}$) See Application Note 118 for details of trim equations and trim curves
Open sense voltage		4.85	5.00	5.25	Vdc	

EXQ125-48S05J Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	h	90.8	92		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	h	91	92.2		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

EXQ125-48S12J Model

Input Characteristics

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Input current - operating	I_{in}		2.23	2.26	Adc	$V_{in} = V_{in\ (nom)}$; $I_{out} = I_{out\ (max)}$; $V_o = V_{o\ (nom)}$
Input current - maximum	$I_{in\ (max.)}$		3.30	3.33	Adc	$V_{in} = V_{in\ (min)}$; $I_{out} = I_{out\ (max)}$; $V_o = V_{o\ (nom)}$, measured at converter
Input Capacitor ripple current	$I_{in\ (ripple)}$		150 500		mA rms mA pk-pk	$I_{out} = I_{out\ (max)}$, measured without standard filter. See Application Note 118
Reflected ripple current	$I_{in\ (refl)}$		4 8		mA rms mA pk-pk	$I_{out} = I_{out\ (max)}$, measured with standard filter. See Application Note 118
Input capacitance - Internal	C_{input}	2.4	3	5.4	µF	Internal to converter
Input capacitance - External bypass	C_{bypass}		33		µF	Recommended customer added capacitance

EXQ125-48S12J Model

Electrical Characteristics - O/P

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Nominal set-point voltage	Vo (nom)	11.82	12	12.18	Vdc	$V_{in} = V_{in\ (nom)}$; $I_{out} = I_{out\ (nom)}$
Total regulation band	V_o	11.64		12.36	Vdc	For all line, static load and temperature until end of life
Line regulation			0.01	0.1	%	$I_{out} = I_{out}$ (nom), V_{in} (min) to V_{in} (max)
Load regulation			0.02	0.2	%	$V_{in} = V_{in}$ (nom), I_{out} (min) to I_{out} (max)
Temperature regulation			0.002	0.02	±%/˚C	$V_{in} = V_{in}$ (nom), $I_{out} = I_{out\ (max)}$
Output current continuous	Iout	0		8.3	Adc	
Output current - short circuit	I_{sc}	8.8	9.5	11	A rms	Continuous, unit auto recovers from short, V_o < 100 mV
Load transient response - peak deviation	$V_{dynamic}$/ Vo (nom)		2		%	Peak deviation for 50% to 75% step load, di/dt = 100 mA/µs, % of Vo (nom)
Load transient response - recovery	$T_{recovery}$		100	150	µs	Settling time to within 1% of output set point voltage for 50% to 75% load step
External load capacitance	C_{ext}	0		1,000	µF	Higher load capacitance values may be possible. Contact Artesyn Technologies for details
Output voltage - noise	V_{p-p} V_{rms}		60 20	100 30	mV pk-pk mV rms	Measurement bandwidth 20 MHz See Application Note 118 for test set-up

EXQ125-48S12J Model

Protection and Control Features

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Overvoltage clamp voltage	V_{ov}	13.5		14.6	Vdc	Non-latching. See Application Note 118 for details
Overcurrent limit inception	I_{oc}	8.8	9.5	11	Adc	V_o = 90% of V_o (nom)
Output voltage trim range				110	%	Trim up (% of $V_{o\ nom}$)
		90			%	Trim down (% of $V_{o\ nom}$) See Application Note 118 for details of trim equations and trim curves
Open sense voltage		11.6	12	12.5	Vdc	

EXQ125-48S12J Model

Efficiency

Characteristic	Symbol	Min	Typ	Max	Units	Notes and Conditions
Efficiency	h	91.8	93		%	I_{out} = 100% I_{out} (max), V_{in} = V_{in} (nom)
Efficiency	h	91.5	92.8		%	I_{out} = 50% I_{out} (max), V_{in} = V_{in} (nom)

EXQ125-48S1V2J Model

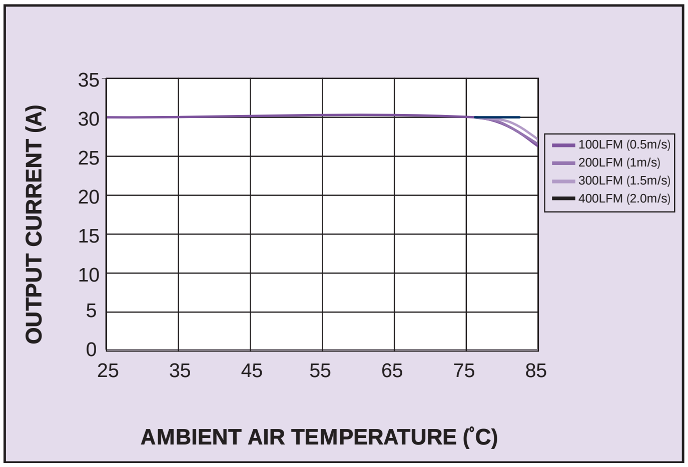


Figure 1: Derating Curve with Forced Air

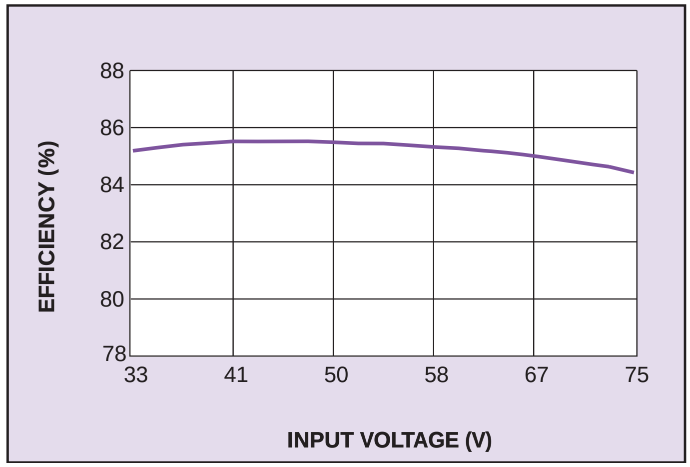


Figure 2: Efficiency vs. Line

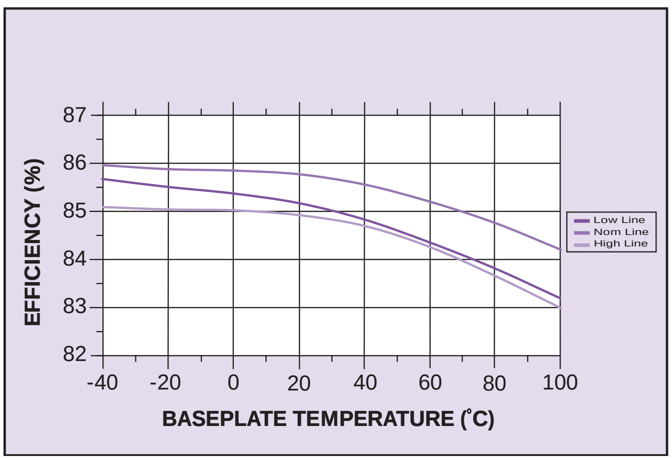


Figure 3: Typical Efficiency vs. Baseplate Temperature

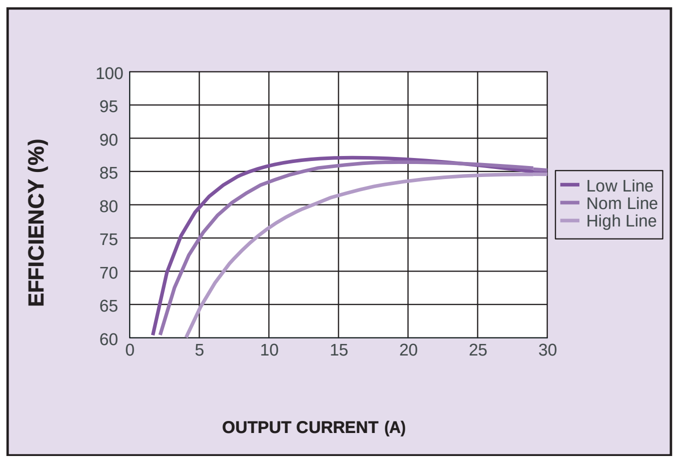


Figure 4: Efficiency vs. Load

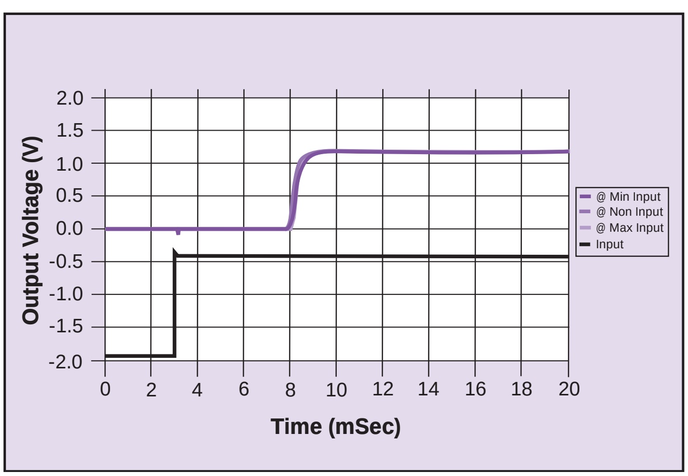


Figure 5: Turn-on Characteristic

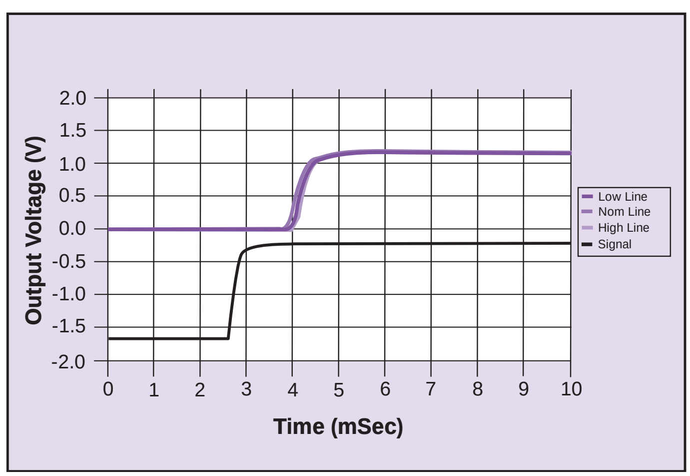


Figure 6: Control On/Off Characteristic

EXQ125-48S1V2J Model

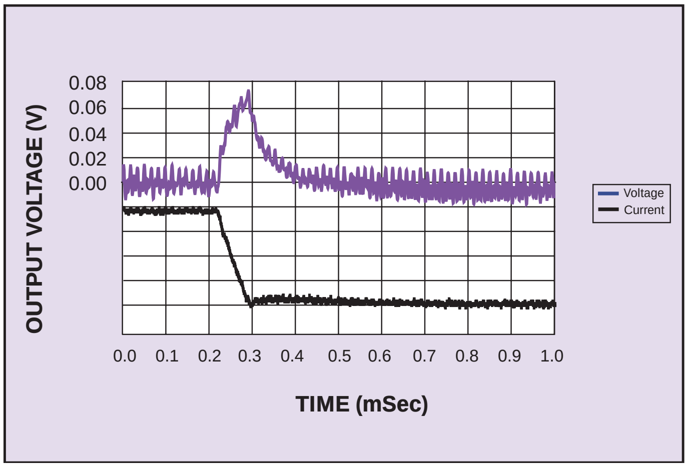


Figure 7: Typical Transient Response 75-50% Step Load Change

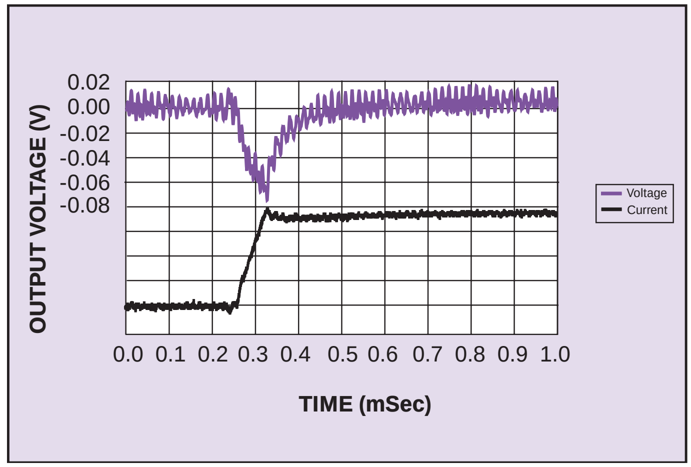


Figure 8: Typical Transient Response 50-75% Step Load Change

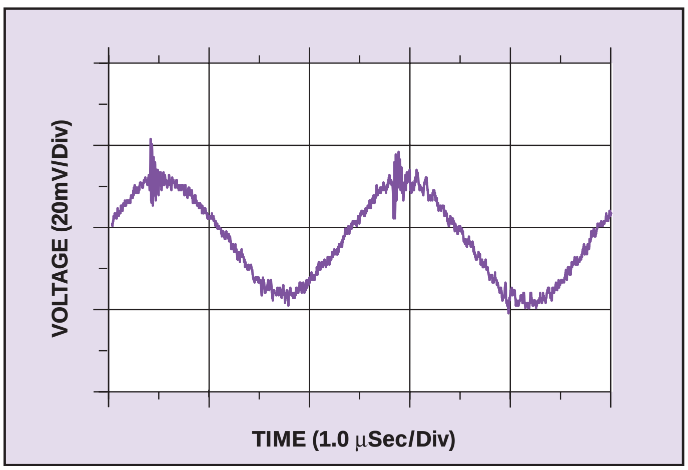


Figure 9: Typical Output Ripple and Noise Measurement

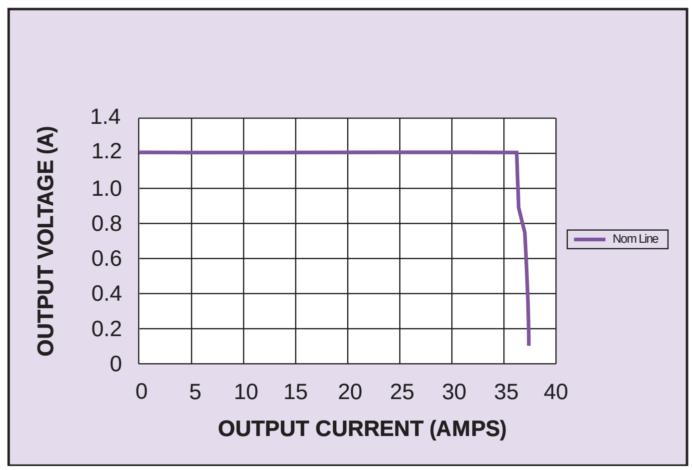


Figure 10: Current Limit Characteristic

EXQ125-48S1V5J Model

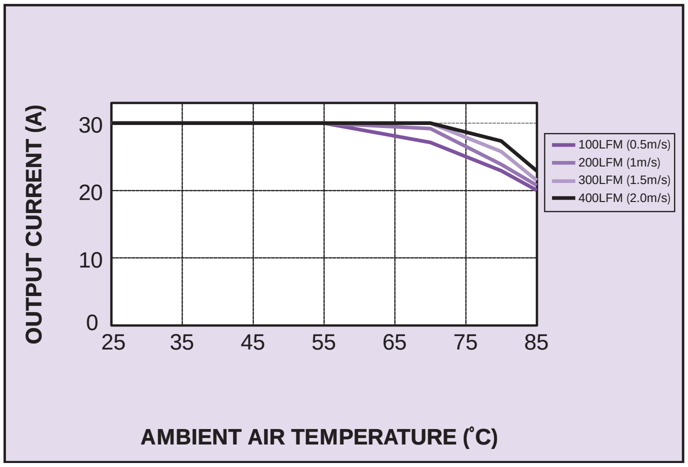


Figure 11: Derating Curve with Forced Air

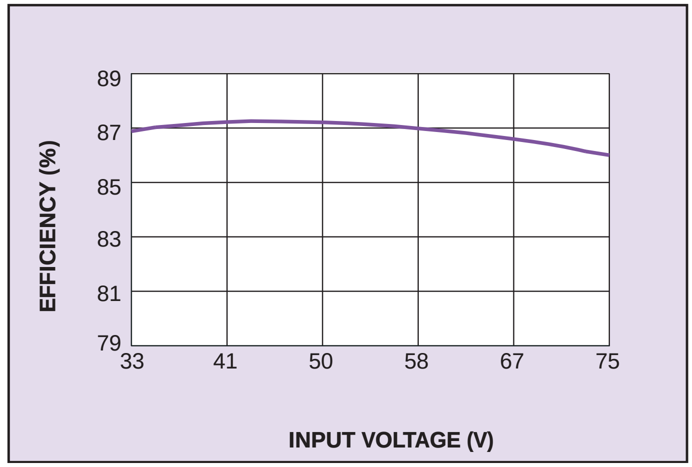


Figure 12: Efficiency vs. Line

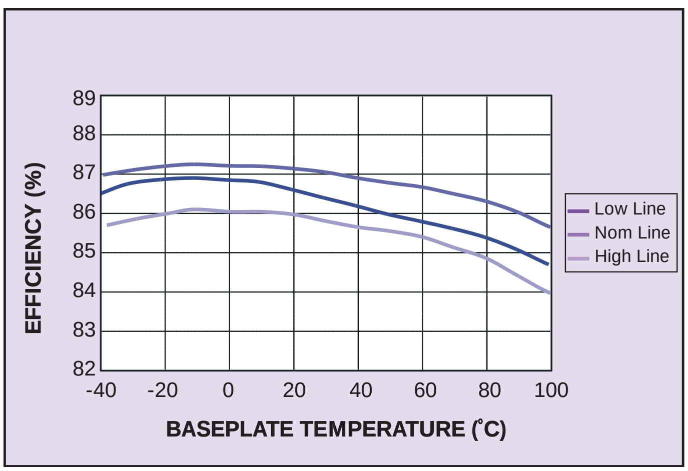


Figure 13: Typical Efficiency vs. Baseplate Temperature

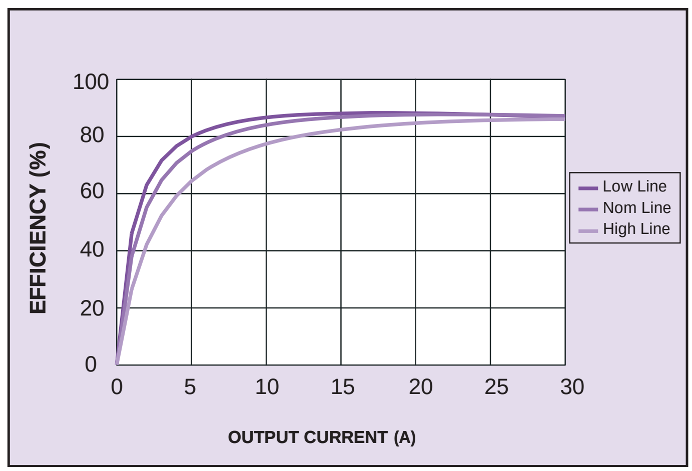


Figure 14: Efficiency vs. Load

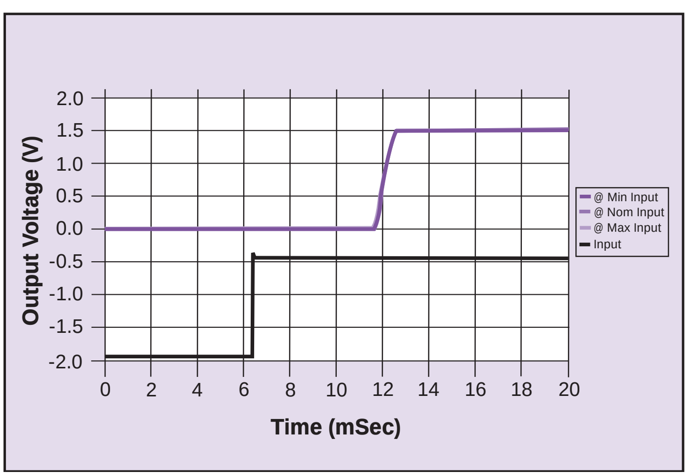


Figure 15: Turn-on Characteristic

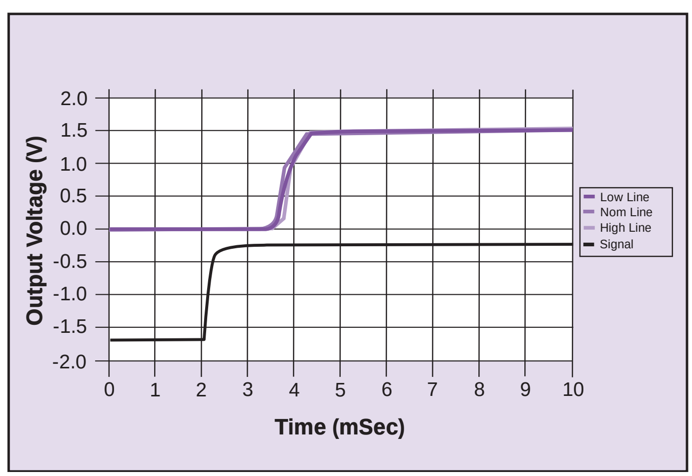


Figure 16: Control On/Off Characteristic

EXQ125-48S1V5J Model

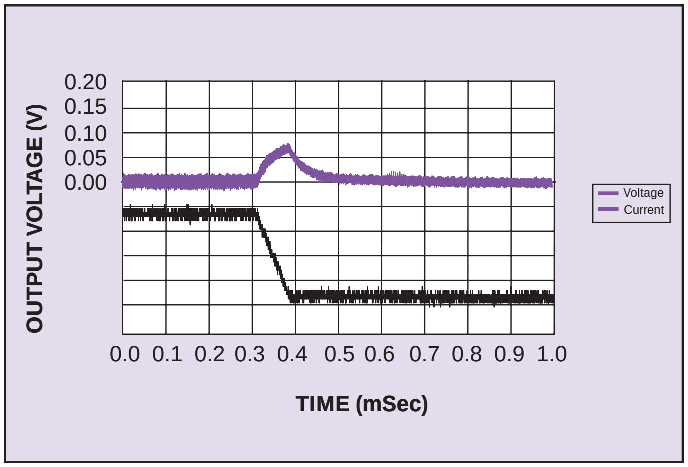


Figure 17: Typical Transient Response 75-50% Step Load Change

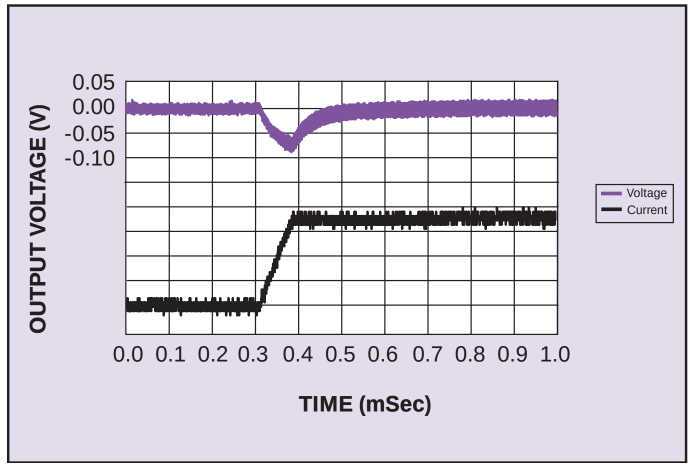


Figure 18: Typical Transient Response 50-75% Step Load Change

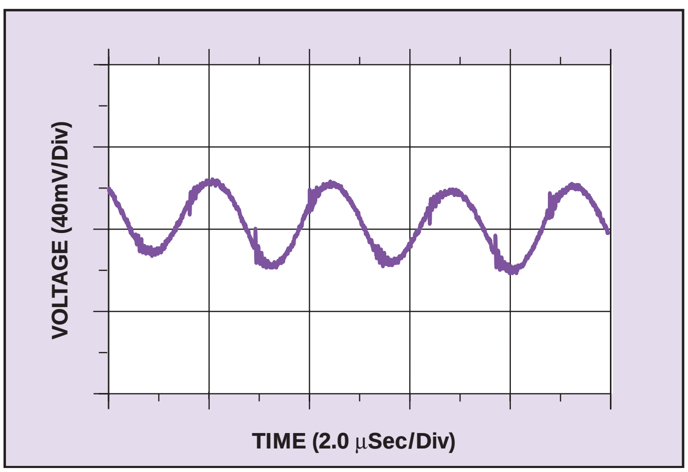


Figure 19: Typical Output Ripple and Noise Measurement

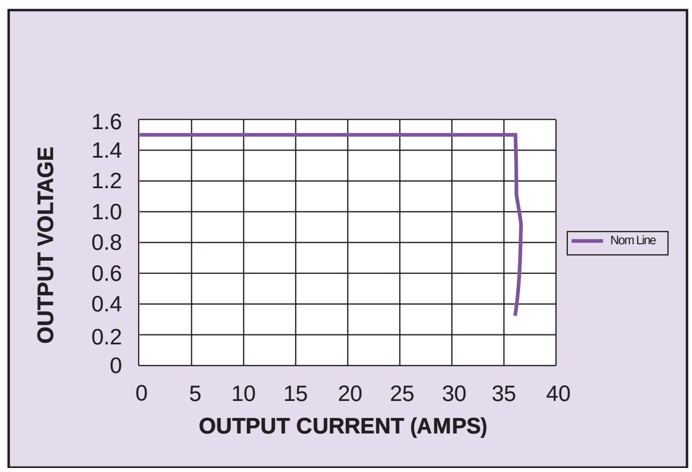


Figure 20: Current Limit Characteristic

EXQ125-48S1V8J Model

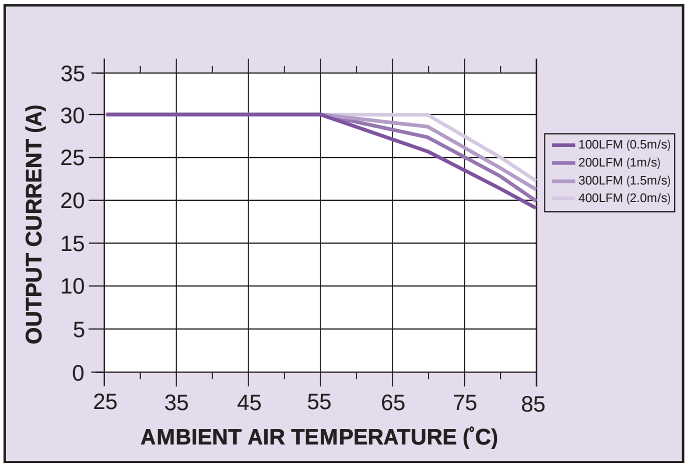


Figure 21: Derating Curve with Forced Air

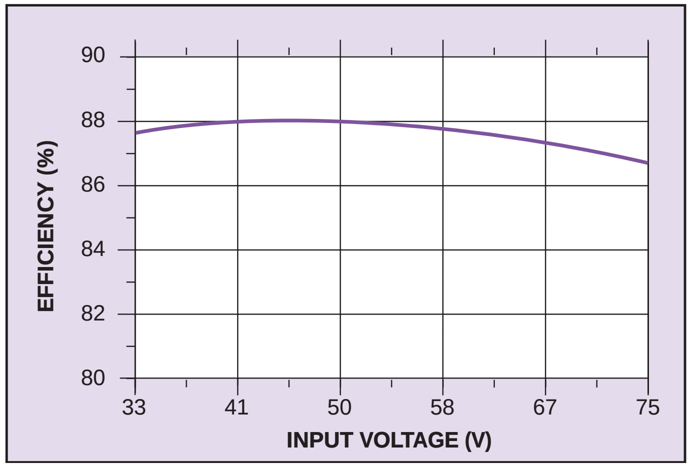


Figure 22: Efficiency vs. Line

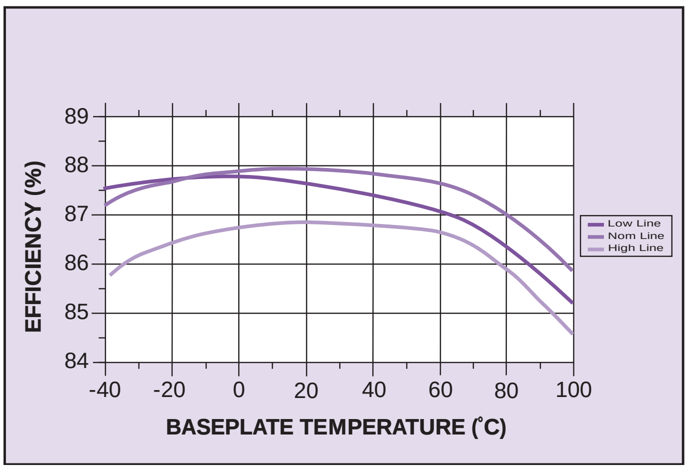


Figure 23: Typical Efficiency vs. Baseplate Temperature

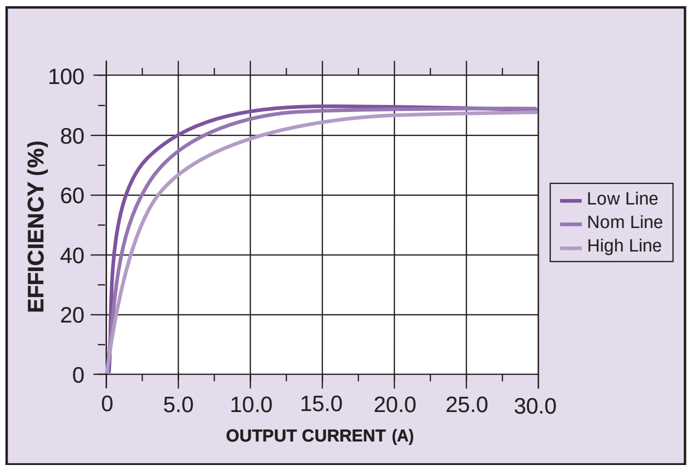


Figure 24: Efficiency vs. Load

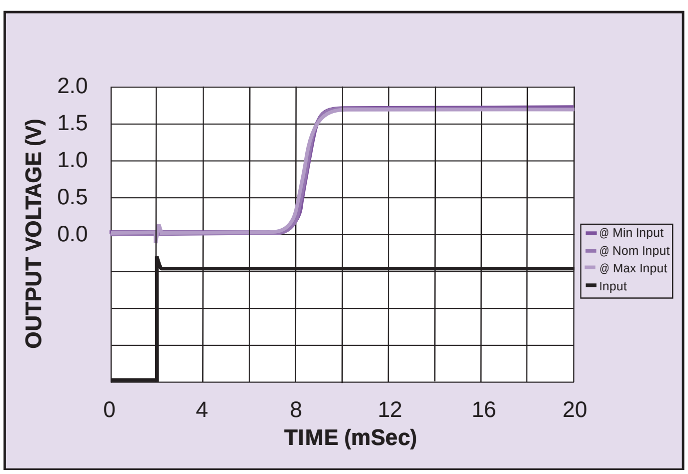


Figure 25: Turn-on Characteristic

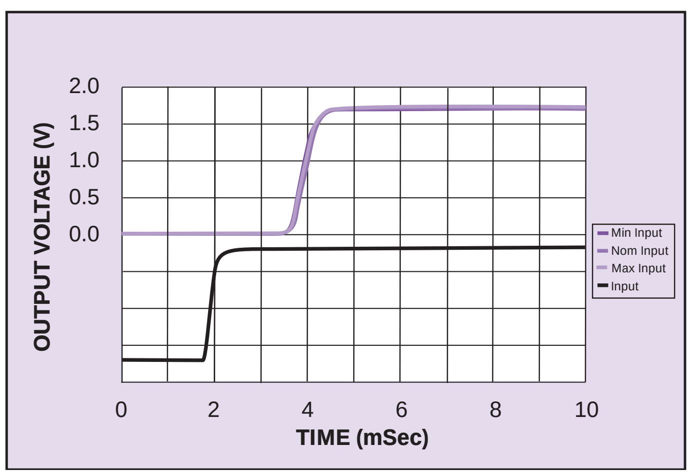


Figure 26: Control On/Off Characteristic

EXQ125-48S1V8J Model

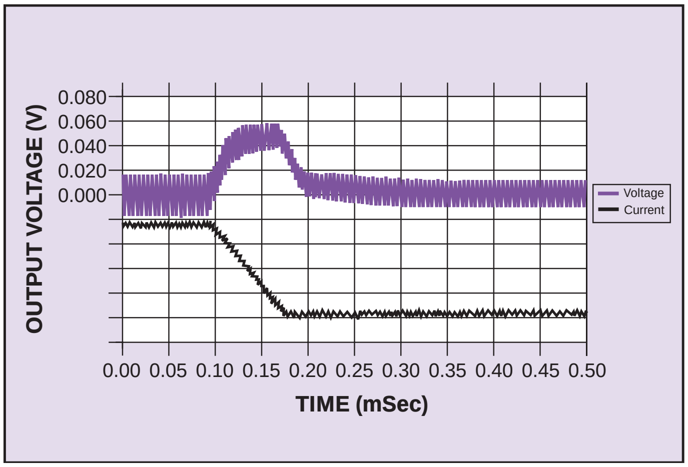


Figure 27: Typical Transient Response 75-50% Step Load Change

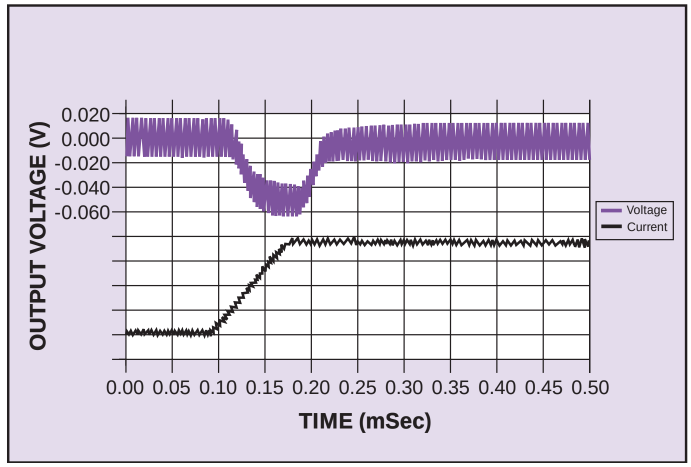


Figure 28: Typical Transient Response 50-75% Step Load Change

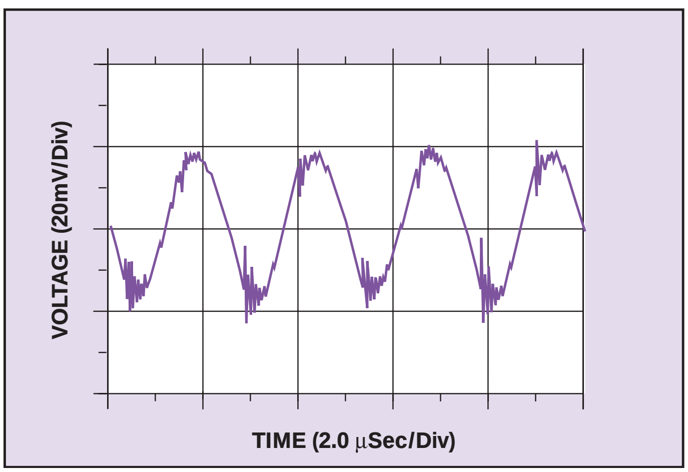


Figure 29: Typical Output Ripple and Noise Measurement

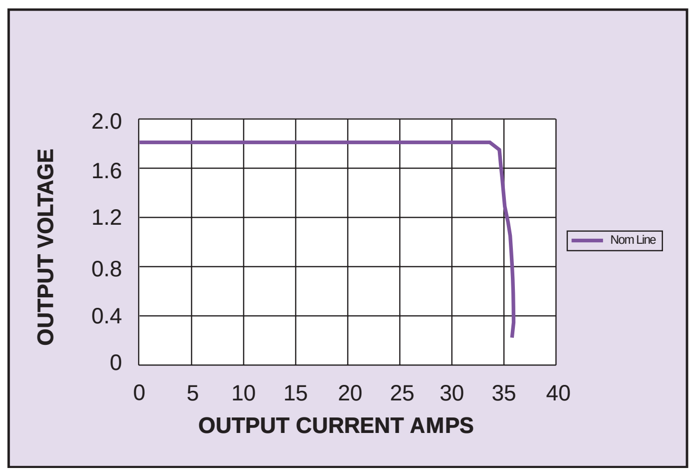


Figure 30: Current Limit Characteristic

EXQ125-48S2V5J Model

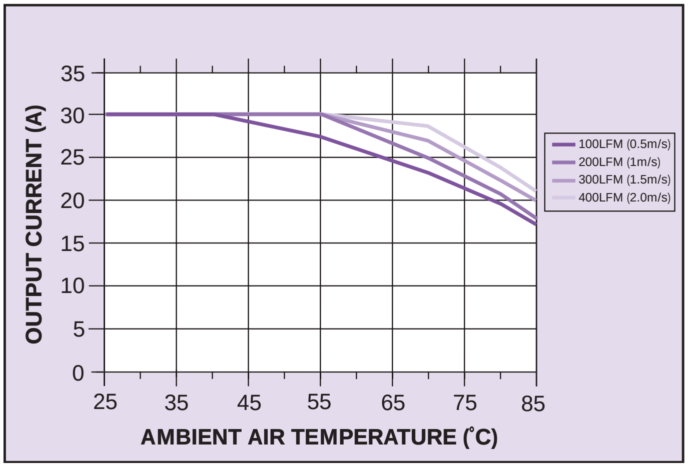


Figure 31: Derating Curve with Forced Air

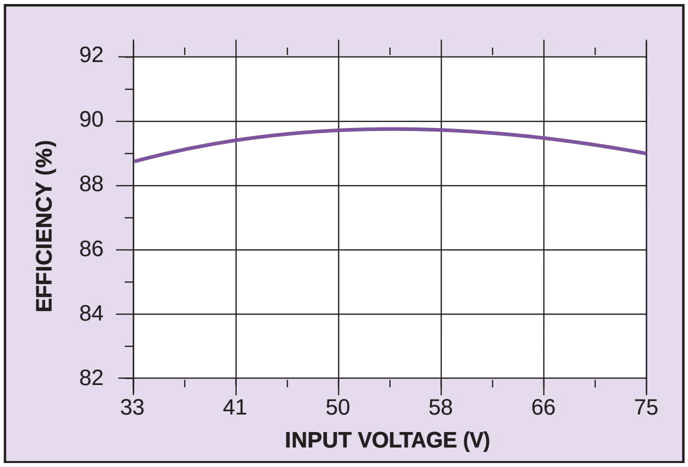


Figure 32: Efficiency vs. Line

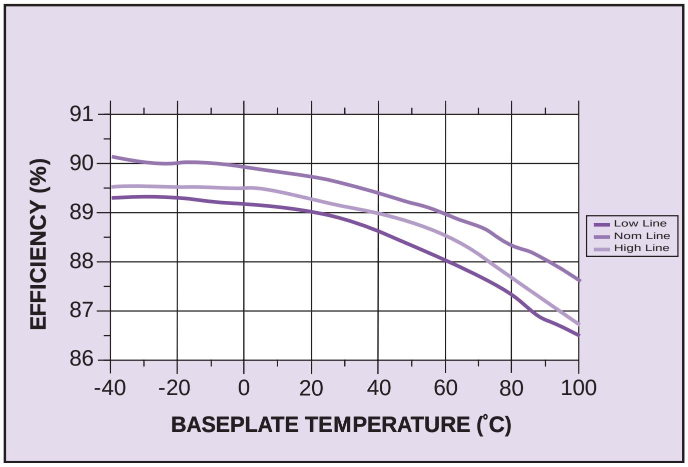


Figure 33: Typical Efficiency vs. Baseplate Temperature

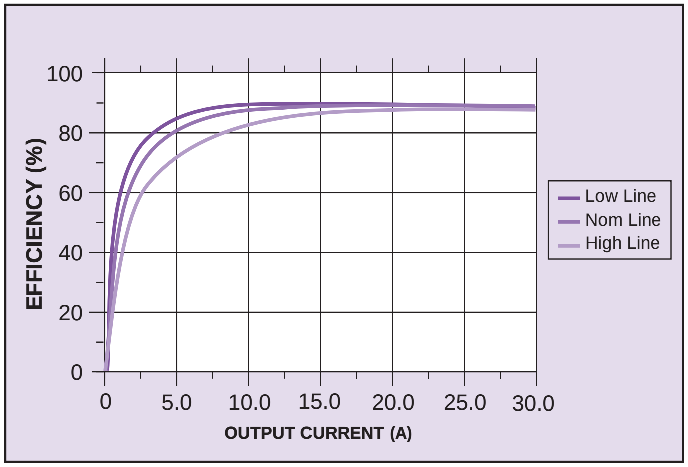


Figure 34: Efficiency vs. Load

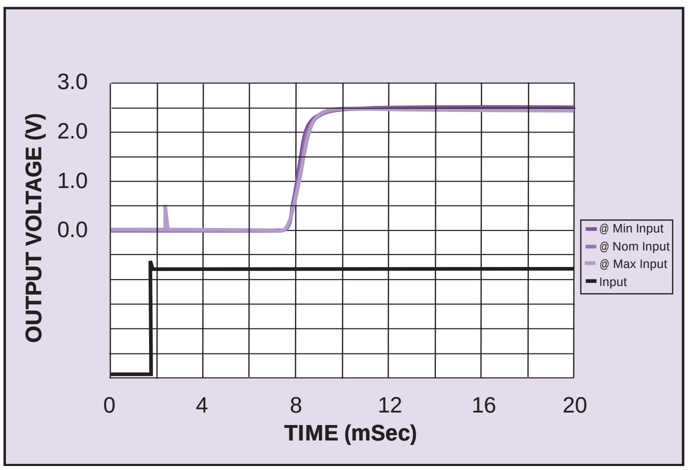


Figure 35: Turn-on Characteristic

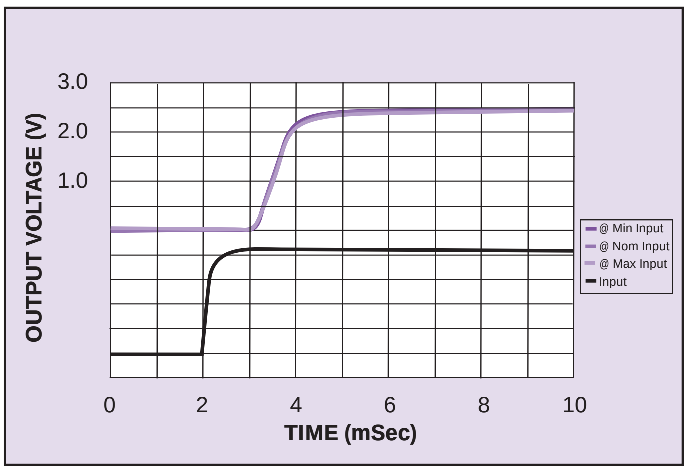


Figure 36: Control On/Off Characteristic

EXQ125-48S2V5J Model

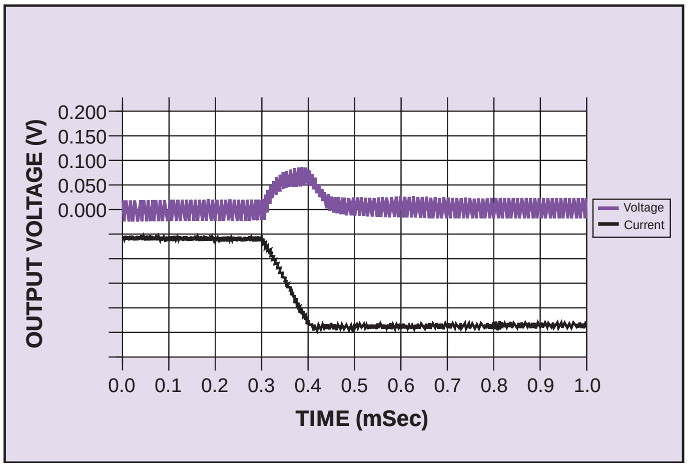


Figure 37: Typical Transient Response 75-50% Step Load Change

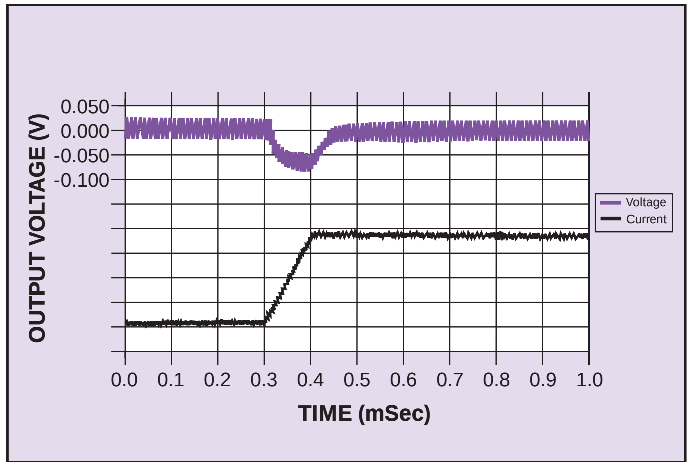


Figure 38: Typical Transient Response 50-75% Step Load Change

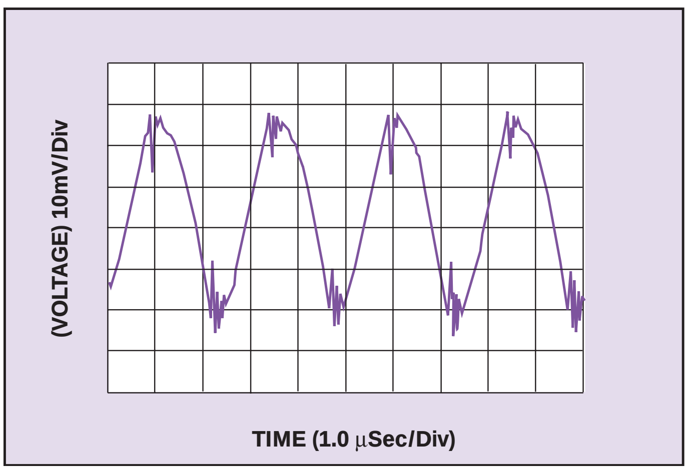


Figure 39: Output Ripple and Noise Measurement

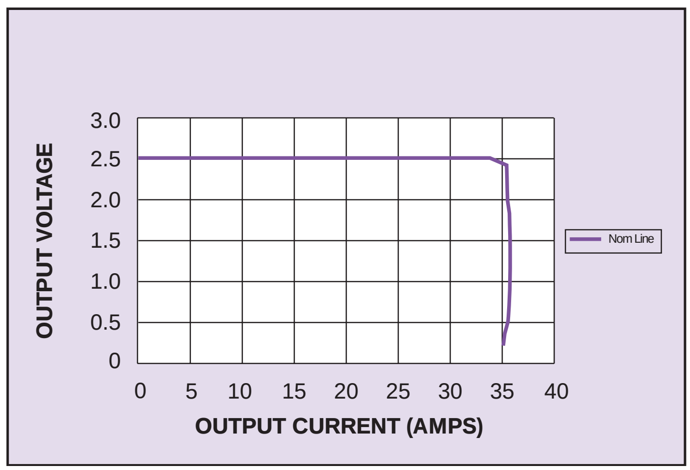


Figure 40: Current Limit Characteristic

EXQ125-48S3V3J Model

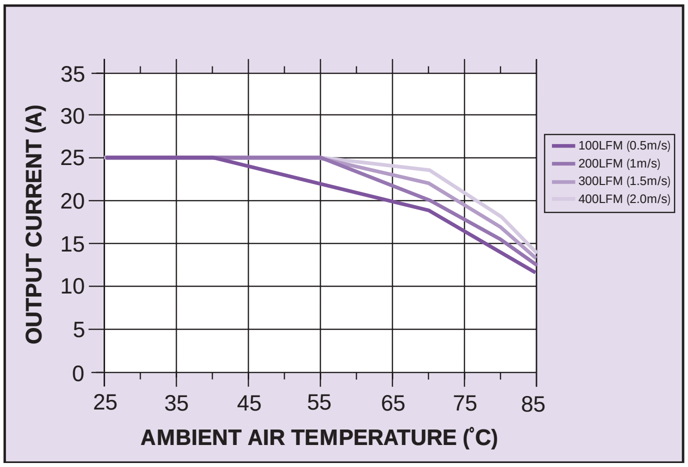


Figure 41: Derating Curve with Forced Air

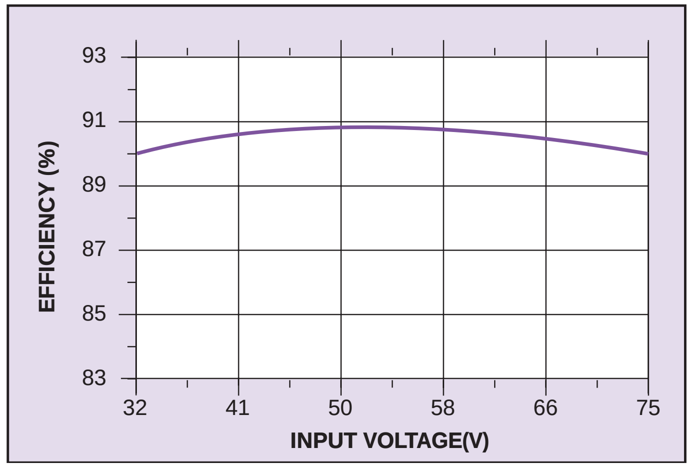


Figure 42: Efficiency vs. Line

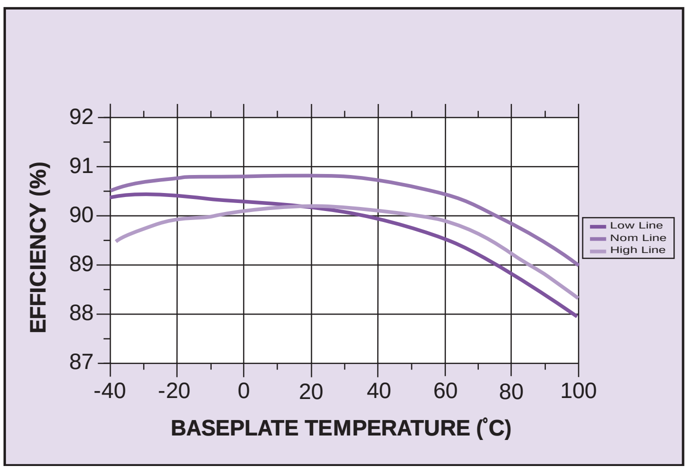


Figure 43: Typical Efficiency vs. Baseplate Temperature

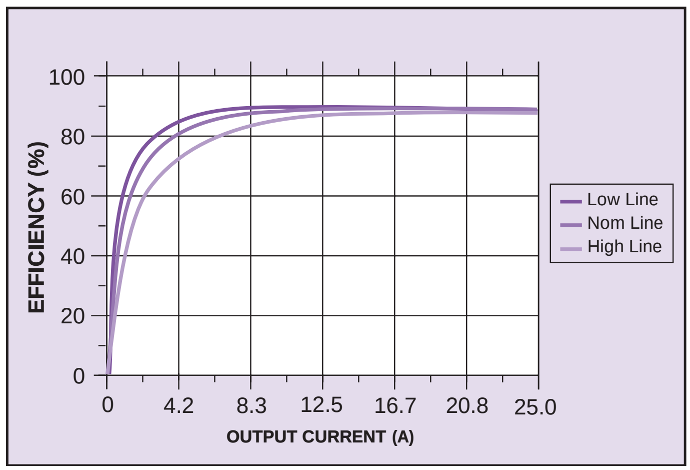


Figure 44: Efficiency vs. Load

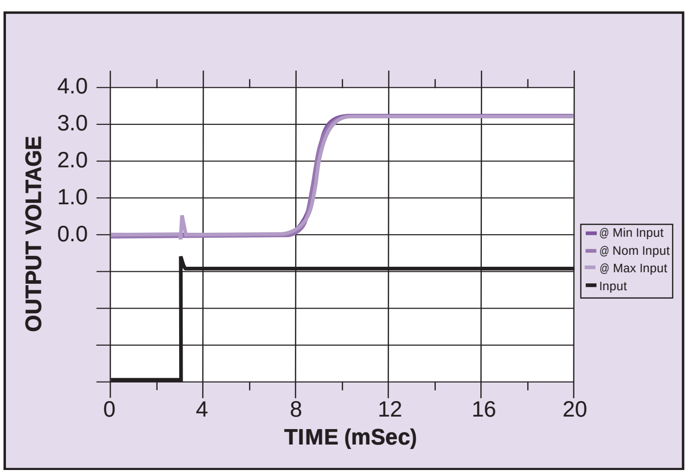


Figure 45: Turn-on Characteristic

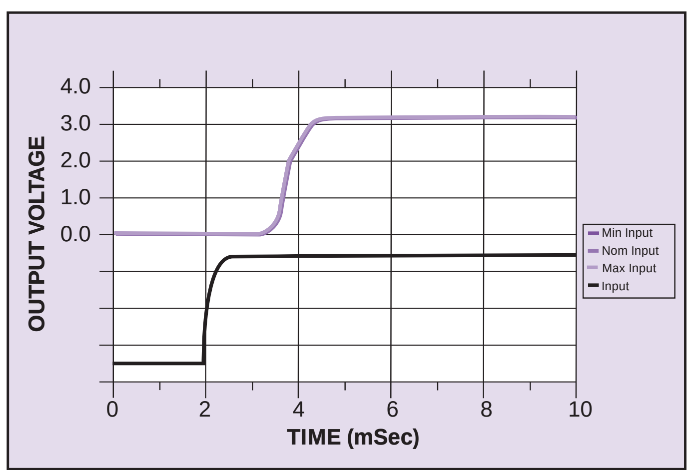


Figure 46: Control On/Off Characteristic

EXQ125-48S3V3J Model

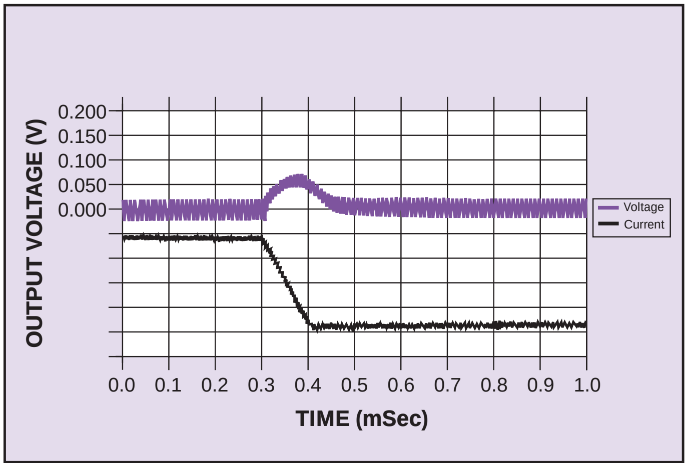


Figure 47: Typical Transient Response 75-50% Step Load Change

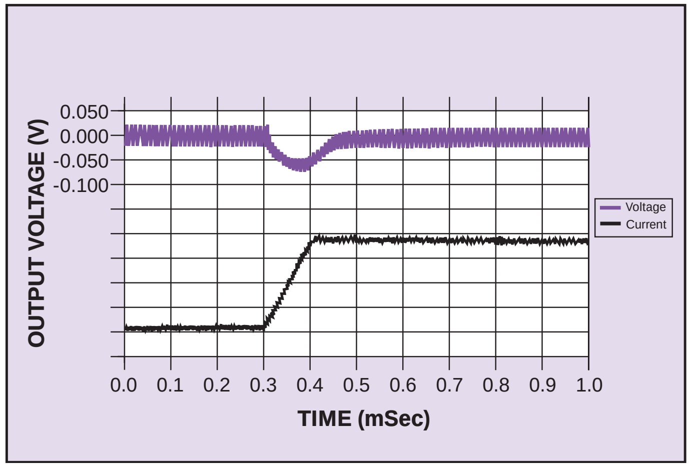


Figure 48: Typical Transient Response 50-75% Step Load Change

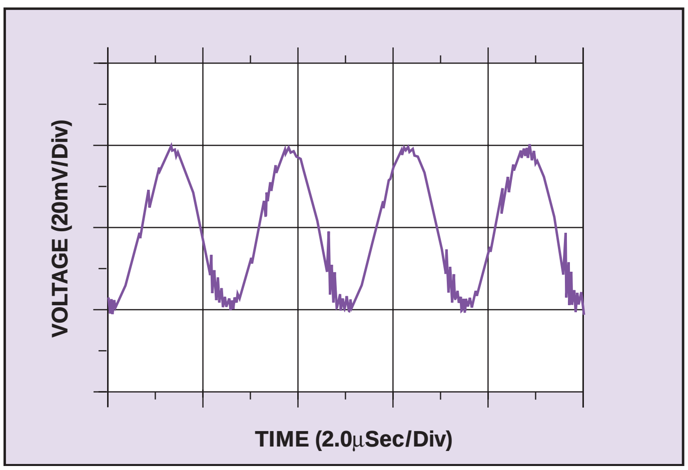


Figure 49: Output Ripple and Noise Measurement

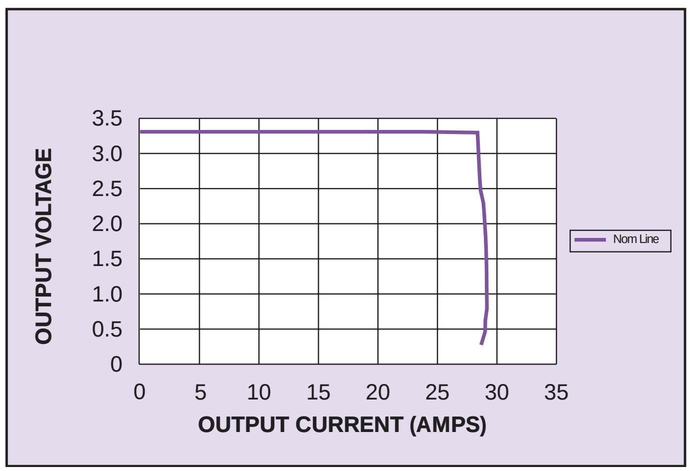


Figure 50: Current Limit Characteristic

EXQ125-48S05J Model

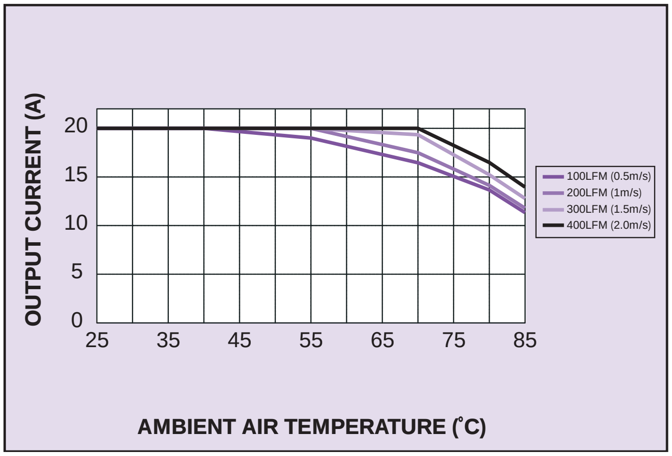


Figure 51: Derating Curve with Forced Air

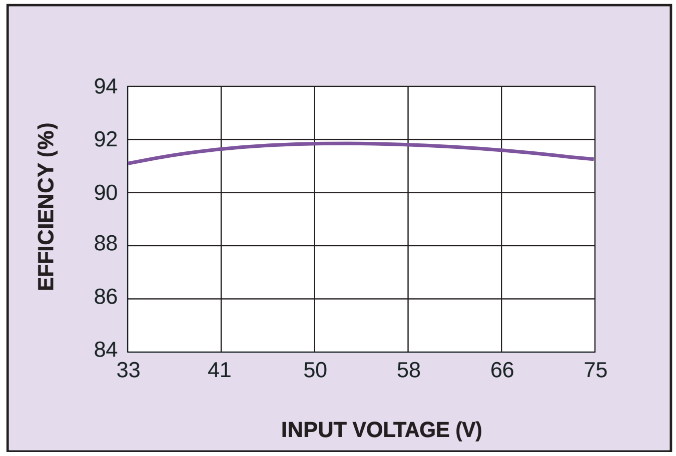


Figure 52: Efficiency vs. Line

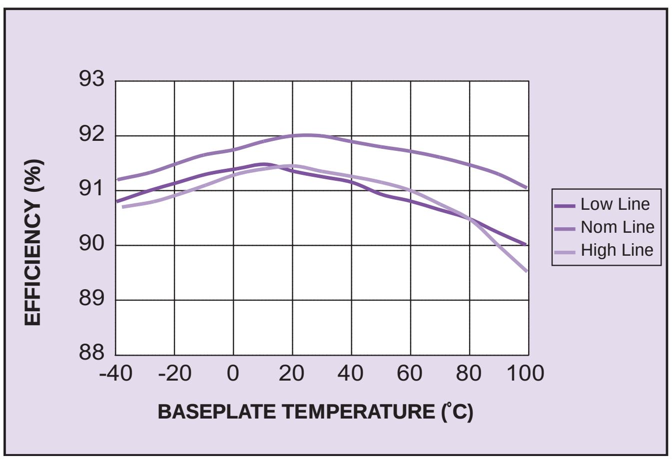


Figure 53: Typical Efficiency vs. Baseplate Temperature

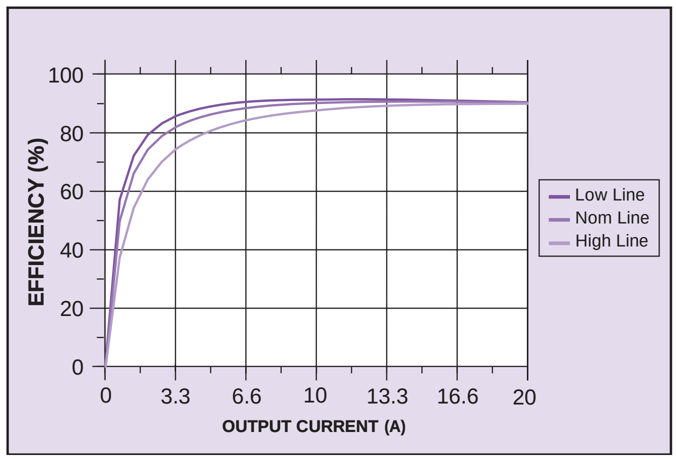


Figure 54: Efficiency vs. Load

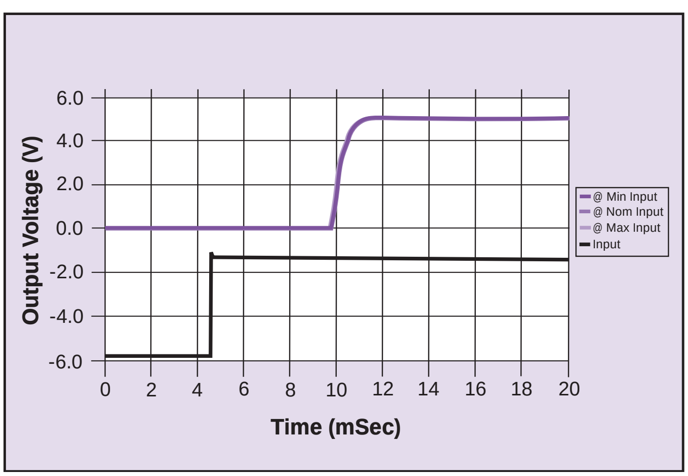


Figure 55: Turn-on Characteristic

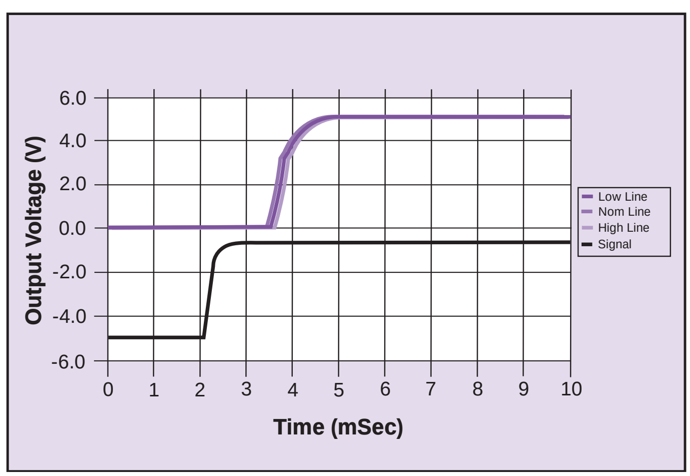


Figure 56: Control On/Off Characteristic

EXQ125-48S05J Model

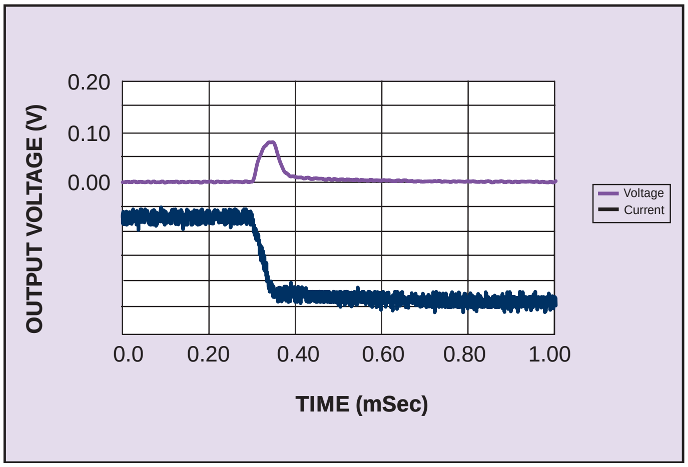


Figure 57: Typical Transient Response 75-50% Step Load Change

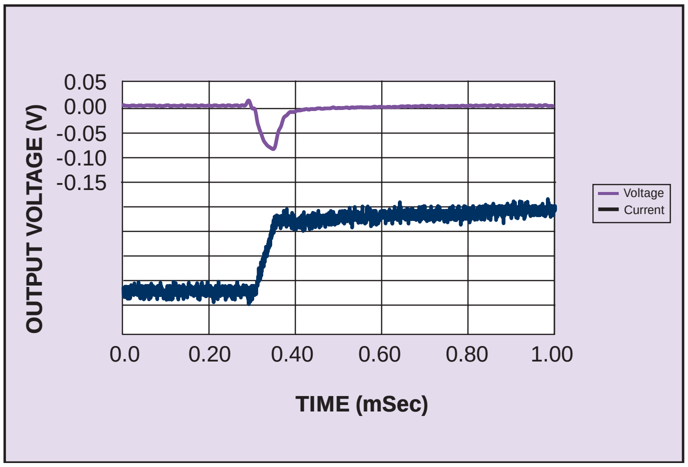


Figure 58: Typical Transient Response 50-75% Step Load Change

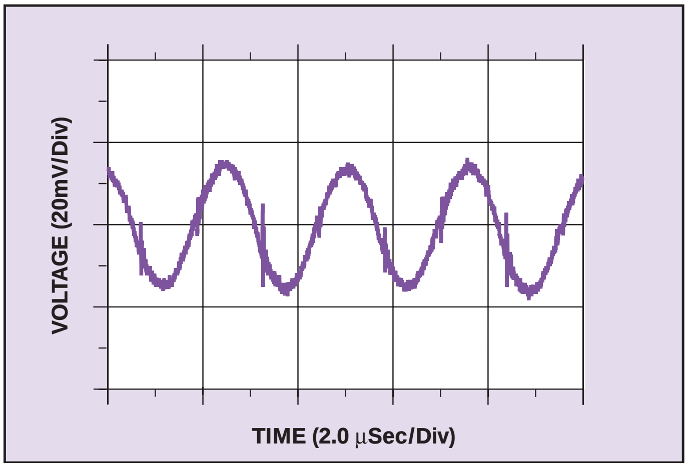


Figure 59: Output Ripple and Noise Measurement

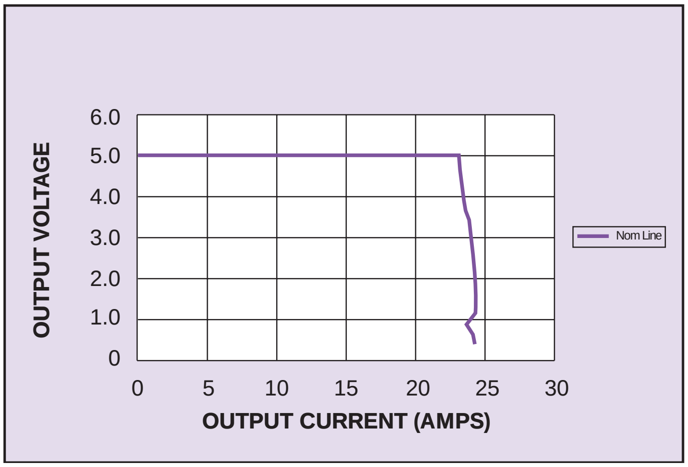


Figure 60: Current Limit Characteristic

EXQ125-48S12J Model

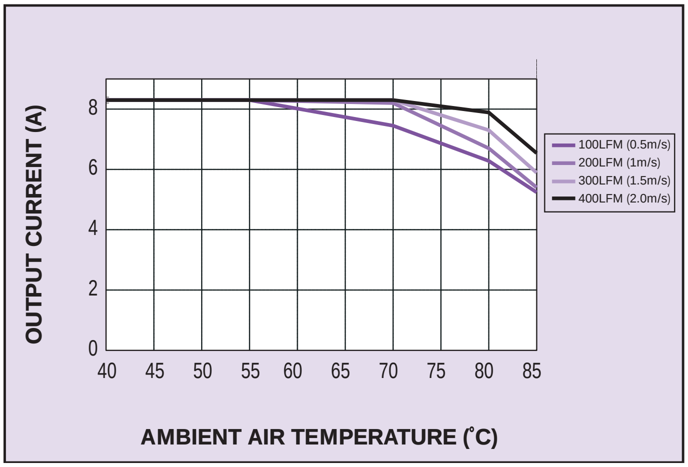


Figure 61: Derating Curve with Forced Air

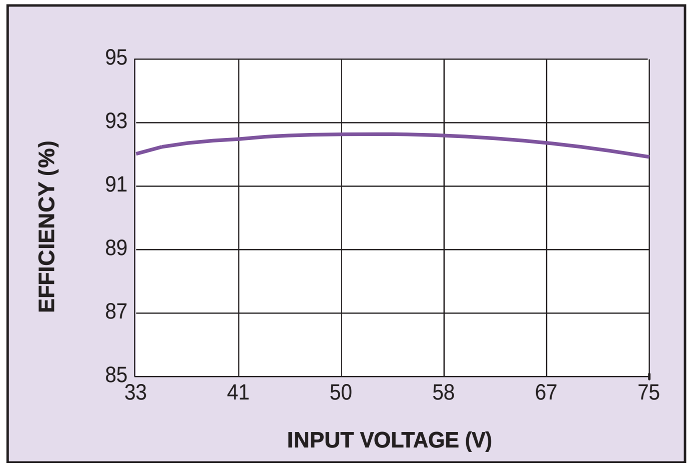


Figure 62: Efficiency vs. Line

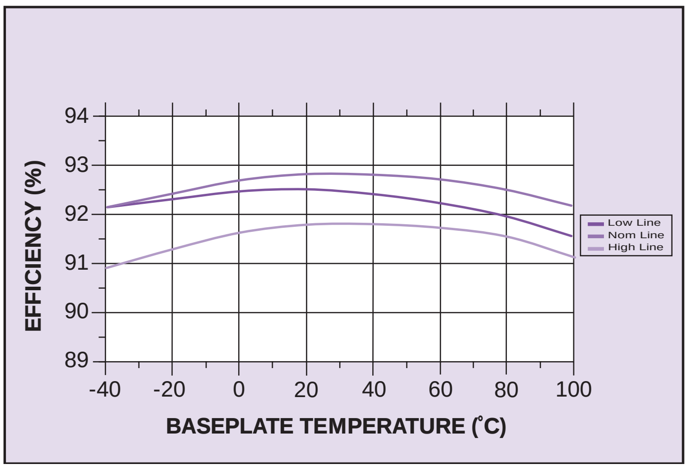


Figure 63: Typical Efficiency vs. Baseplate Temperature

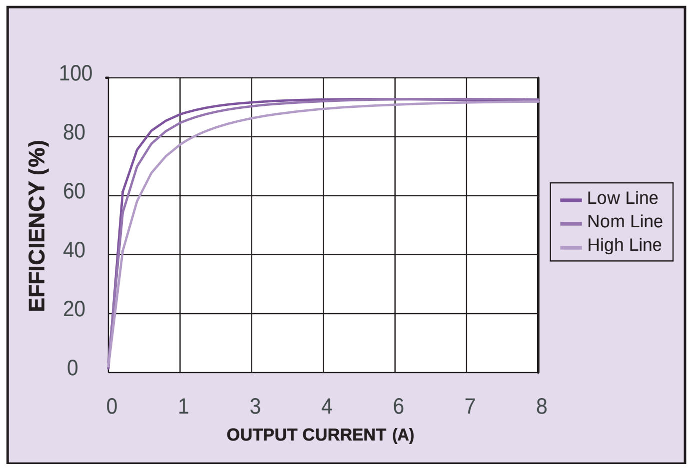


Figure 64: Efficiency vs. Load

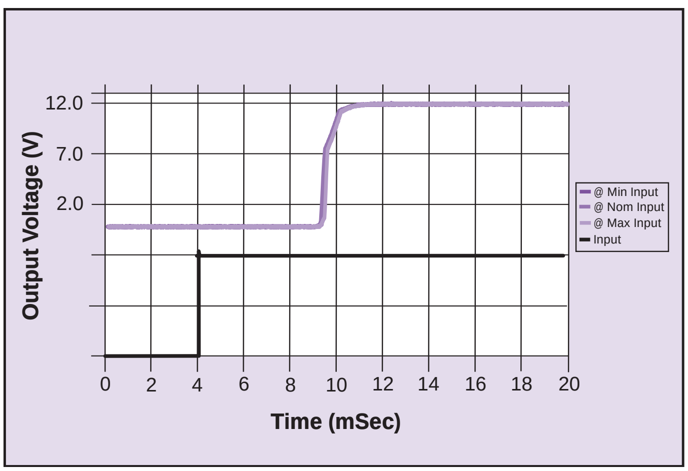


Figure 65: Turn-on Characteristic

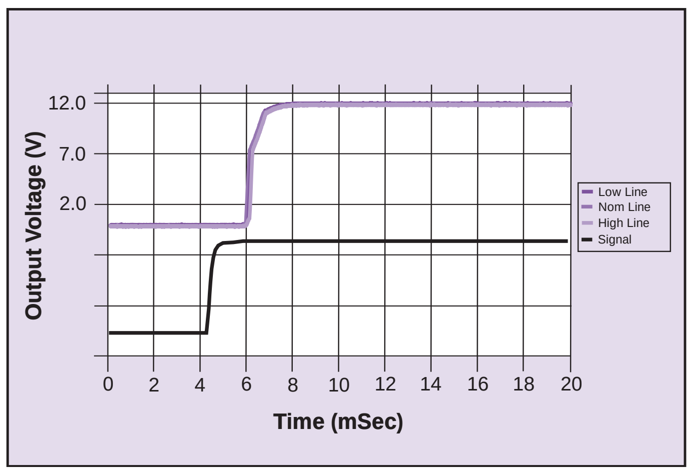


Figure 66: Control On/Off Characteristic

EXQ125-48S12J Model

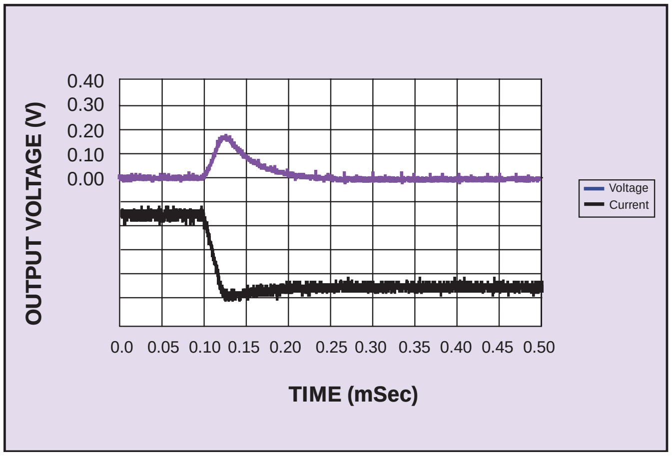


Figure 67: Typical Transient Response 75-50%
Step Load Change

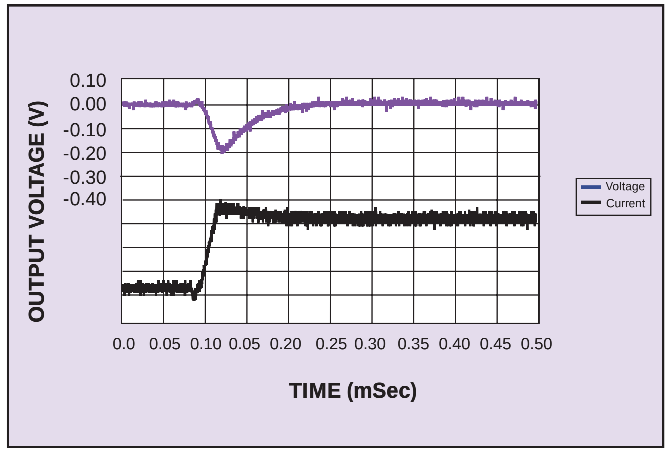


Figure 68: Typical Transient Response 50-75%
Step Load Change

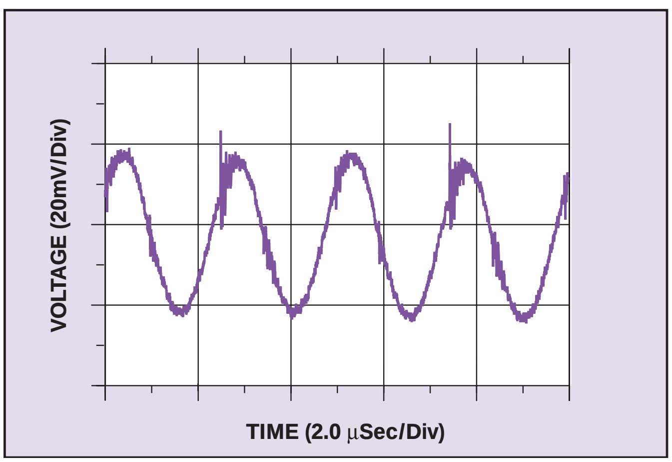


Figure 69: Output Ripple and Noise Measurement

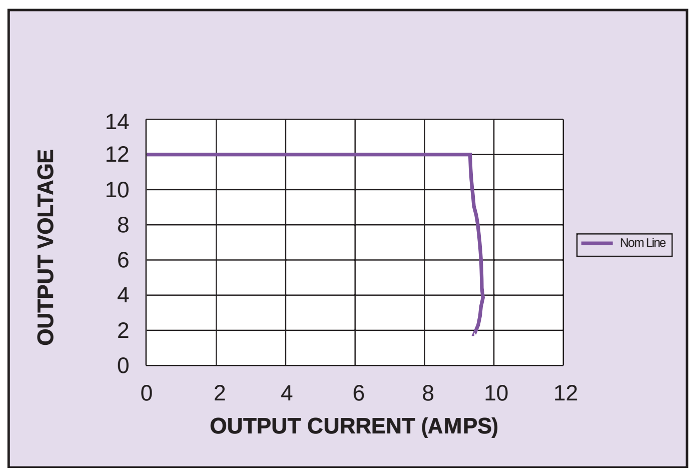
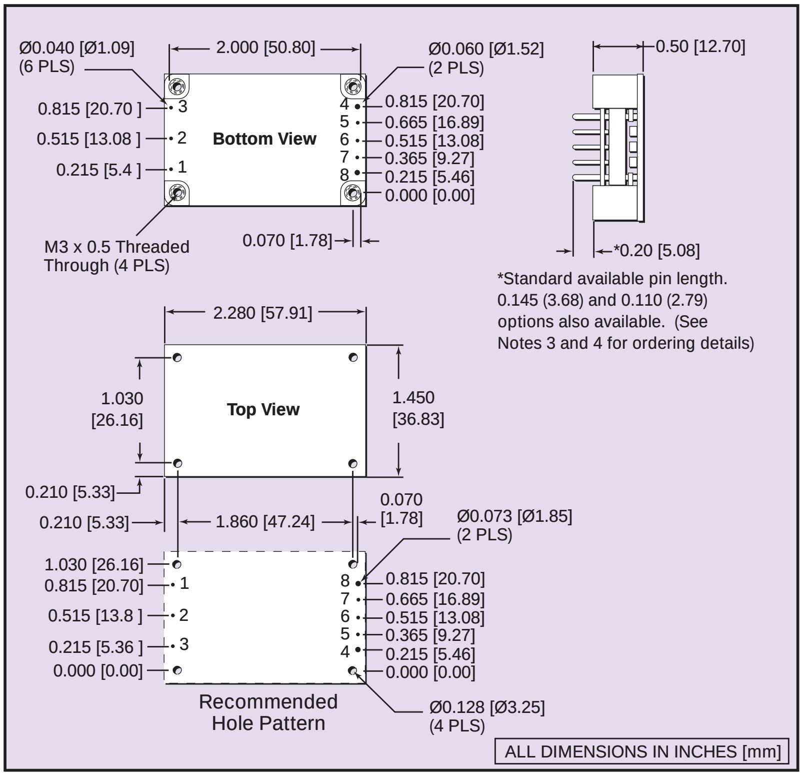


Figure 70: Current Limit Characteristic



Pin Connections

Pin No.	Function
1	+ Vin
2	ON/OFF
3	- Vin
4	- Vout
5	- Sense
6	Trim
7	+ Sense
8	+ Vout

Figure 71: Dimensions and Pinout

EXQ125 48V SERIES

Single Output

Embedded Power for
Business-Critical Continuity

Notes

1 The control pin is referenced to Vin-.

2 Active low Remote ON/OFF is available. Standard product is active high. When ordering active low parts, designate with the Suffix '-R' e.g. EXQ125-48S3V3-RJ. See Application Note 118 for detailed information regarding ON/OFF control control implementation.

3 When ordering 0.145" pin lengths designate with the Suffix'-N',

e.g. EXQ125-48S3V3-NJ. If the product is already a '-R'suffix product then the suffix will be '-RNJ', e.g EXQ125-48S3V3-RNJ.

4 When ordering 0.110" pin lengths designate with the Suffix'-K', e.g. EXQ125-48S3V3-KJ. If the product is already a '-R' suffix product then the suffix will be '-RKJ' e.g EXQ125-48S3V3-RKJ.

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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