PicoTLynx™ 3A: Non-Isolated DC-DC Power Modules

2.4Vdc –5.5Vdc input; 0.6Vdc to 3.63Vdc output; 3A Output Current

Electrical Specifications (continued)

Parameter	Device	Symbol	Min	Typ	Max	Unit
Output Voltage Set-point (with 0.5% tolerance for external resistor used to set output voltage)	All	$V_{O, set}$	-1.5		+1.5	% $V_{O, set}$
Output Voltage (Over all operating input voltage, resistive load, and temperature conditions until end of life)	All	$V_{O, set}$	-3.0	—	+3.0	% $V_{O, set}$
Adjustment Range Selected by an external resistor	All	V_O	0.6		3.63	Vdc
Output Regulation (for $V_O \geq$ 2.5Vdc)						
Line (V_{IN}=$V_{IN, min}$ to $V_{IN, max}$)	All			—	+0.4	% $V_{O, set}$
Load (I_O=$I_{O, min}$ to $I_{O, max}$)	All			—	10	mV
Output Regulation (for V_O < 2.5Vdc)						
Line (V_{IN}=$V_{IN, min}$ to $V_{IN, max}$)	All			—	10	mV
Load (I_O=$I_{O, min}$ to $I_{O, max}$)	All			—	5	mV
Temperature (T_{ref}=$T_{A, min}$ to $T_{A, max}$)	All			—	0.4	% $V_{O, set}$
Remote Sense Range	All				0.5	V
Output Ripple and Noise on nominal output (V_{IN}=$V_{IN, nom}$ and I_O=$I_{O, min}$ to $I_{O, max}$ Co = 0.1µF // 10 µF ceramic capacitors) Peak-to-Peak (5Hz to 20MHz bandwidth) RMS	All		—	20 15	35 25	mV_{pk-pk} mV_{rms}
External Capacitance[1] Without the Tunable Loop™ ESR ≥ 1 mΩ With the Tunable Loop™ ESR ≥ 0.15 mΩ ESR ≥ 10 mΩ	 All All All	 $C_{O, max}$ $C_{O, max}$ $C_{O, max}$	 0 0 0	 — — —	 47 1000 3000	 µF µF µF
Output Current	All	I_o	0		3	Adc
Output Current Limit Inception (Hiccup Mode)	All	$I_{O, lim}$			200	% $I_{o,max}$
Output Short-Circuit Current (V_O≤250mV) (Hiccup Mode)	All	$I_{O, s/c}$		0.12		Adc
Efficiency V_{IN}= 3.3Vdc, T_A=25°C I_O=$I_{O, max}$, V_O= $V_{O,set}$ V_{IN}= 5Vdc	$V_{O,set}$ = 0.6Vdc $V_{O, set}$ = 1.2Vdc $V_{O,set}$ = 1.8Vdc $V_{O,set}$ = 2.5Vdc $V_{O,set}$ = 3.3Vdc	η η η η η		81.2 89.4 91.4 93.9 94.4		% % % % %
Switching Frequency	All	f_{sw}	—	600	—	kHz
Dynamic Load Response (dIo/dt=10A/µs; V_{IN} = 5V; V_{out} = 1.5V, T_A=25°C) Load Change from Io= 0% to 50% of Io,max; Co = 0 Peak Deviation Settling Time (Vo<10% peak deviation) Load Change from Io= 50% to 0% of Io,max: , Co = 0 Peak Deviation Settling Time (Vo<10% peak deviation)	 All All All All	 V_{pk} t_s V_{pk} t_s	 	 90 20 100 20	 	 mV µs mV µs

[1] External capacitors may require using the new Tunable Loop™ feature to ensure that the module is stable as well as getting the best transient response. See the Tunable Loop™ section for details.

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General Specifications

Parameter	Min	Typ	Max	Unit
Calculated MTBF (I_O=0.8$I_{O,max}$, T_A=40°C) Telcordia Issue 2 Method 1 Case 3		16,139,760		Hours
Weight	—	1.55 (0.0546)	—	g (oz.)

Feature Specifications

Unless otherwise indicated, specifications apply over all operating input voltage, resistive load, and temperature conditions. See Feature Descriptions for additional information.

Parameter	Device	Symbol	Min	Typ	Max	Units
On/Off Signal Interface						
(V_{IN}=$V_{IN,min}$ to $V_{IN,max}$; open collector or equivalent,						
Signal referenced to GND)						
Device is with suffix "4" – Positive Logic (See Ordering Information)						
Logic High (Module ON)						
Input High Current	All	I_{IH}		—	10	µA
Input High Voltage	All	V_{IH}	1.2	—	$V_{IN,max}$	V
Logic Low (Module OFF)						
Input Low Current	All	I_{IL}	—	—	0.3	mA
Input Low Voltage	All	V_{IL}	-0.3	—	0.3	V
Device Code with no suffix – Negative Logic (See Ordering Information)						
(On/OFF pin is open collector/drain logic input with						
external pull-up resistor; signal referenced to GND)						
Logic High (Module OFF)						
Input High Current	All	I_{IH}	–	–	1	mA
Input High Voltage	All	V_{IH}	V_{IN} – 1.6	–	$V_{IN,max}$	Vdc
Logic Low (Module ON)						
Input low Current	All	I_{IL}	–	–	0.2	mA
Input Low Voltage	All	V_{IL}	-0.2	–	V_{IN} – 1.6	Vdc
Turn-On Delay and Rise Times						
(V_{IN}=$V_{IN,nom}$, I_O=$I_{O,max}$, V_O to within ±1% of steady state)						
Case 1: On/Off input is enabled and then input power is applied (delay from instant at which V_{IN} = $V_{IN,min}$ until V_O = 10% of $V_{O,set}$)	All	Tdelay	–	2	–	msec
Case 2: Input power is applied for at least one second and then the On/Off input is enabled (delay from instant at which Von/Off is enabled until V_O = 10% of $V_{O,set}$)	All	Tdelay	–	2	–	msec
Output voltage Rise time (time for V_O to rise from 10% of Vo, set to 90% of Vo, set)	All	Trise	–	5	–	msec
Output voltage overshoot (T_A = 25°C					3.0	% $V_{O,set}$
V_{IN}= $V_{IN,min}$ to $V_{IN,max}$, I_O= $I_{O,min}$ to $I_{O,max}$)						
With or without maximum external capacitance						
Over Temperature Protection	All	T_{ref}		140		°C
(See Thermal Considerations section)						
Sequencing Delay time						
Delay from $V_{IN,min}$ to application of voltage on SEQ pin	APTH	$T_{SEQ-delay}$	10			msec
Tracking Accuracy (Power-Up: 2V/ms)	APTH	V_{SEQ} –V_O			100	mV
(Power-Down: 2V/ms)	APTH	V_{SEQ} –V_O			100	mV
($V_{IN,min}$ to $V_{IN,max}$; $I_{O,min}$ to $I_{O,max}$ V_{SEQ} < V_O)						