Specifications

T_{CASE} = -55°C to +85°C, V_{IN} = +28V ± 5% unless otherwise specified

Absolute Maximum Ratings		
Input voltage	-0.5V to +50VDC	
Power Output	Internally limited, 17.5W typical	
Soldering temperature	300°C for 10 seconds	
Temperature Range[6]	Operating case temperature	-55°C to +115°C
	Storage case temperature	-65°C to +135°C

TEST	SYMBOL	Condition -55°C ≤ T_C ≤ +85°C, V_{IN} = 28 V_{DC} ±5%, C_L=0 unless otherwise specified		ATO2812T		ATO2815T		Units
				Min	Max	Min	Max	
STATIC CHARACTERISTICS								
OUTPUT								
Voltage [1]	V_{OUT}	I_{OUT} = 0 (main)	TC = 25°C	4.95	5.05	4.95	5.05	V
			Over Temp	4.90	5.10	4.90	5.10	V
		I_{OUT} = 0 (dual)[1]	TC = 25°C	±11.88	±12.12	±14.85	±15.15	V
			Over Temp	±11.76	±12.24	±14.70	±15.30	V
Current [1,2,3]	I_{OUT}	V_{IN} = 16, 28, and 40 VDC (main)		0.0	2000	0.0	2000	mA
		V_{IN} = 16, 28, and 40 VDC (dual)[1]		0.0	±208	0.0	±167	mA
		V_{IN} = 16, 28, and 40 VDC (dual)			80		80	mVp-p
Ripple Voltage [1,4]	V_{RIP}	BW = DC to 2 MHz (main)						
		V_{IN} = 16, 28, and 40 VDC			40		40	mVp-p
		BW = DC to 2 MHz (dual))						
Power [1,2,3]	P_{OUT}	V_{IN} = 16, 28, and 40 VDC (main)		10		10		W
		(+dual)		2.5		2.5		W
		(-dual)		2.5		2.5		W
		(total)		15		15		W
REGULATION								
Line [1,3]	VR_{LINE}	V_{IN} = 16, 28, and 40 VDC			25		25	
		I_{OUT} = 0, 1000, 2000mA (main)						
		V_{IN} = 16, 28, and 40 VDC (dual)	TC = 25°C		±30		±35	
		I_{OUT} = 0, ±84, ±167mA (dual)	Over Temp		±60		±75	mV
Load [1,3]	VR_{LOAD}	V_{IN} = 16, 28, and 40 VDC			50		50	
		I_{OUT} = 0, 1000, 2000mA (main)						
		V_{IN} = 16, 28, and 40 VDC			±60		±75	
		I_{OUT} = 0, ±84, ±167mA (dual)						
INPUT								
Current	I_{IN}	I_{OUT} = 0, Inhibit (pin 8)			15		15	mA
		Tied to input return (pin 10)						
Ripple Current [4]		I_{OUT} = 0, inhibit (pin 2) = open			40		40	mA
	I_{RIP}	I_{OUT} = 2000 mA (main)			50		50	mAp-p
		I_{OUT} = ±167mA (dual)						
		BW = DC to 2MHz						
EFFICIENCY	E_{FF}	I_{OUT} = 2000mA (main)	TC = 25°C	76		76		%
		I_{OUT} = ±167mA (dual)						
ISOLATION	ISO	Input to output or any pin to case (except pin 7) at 500 VDC	TC = 25°C	100		100		MΩ
Load Fault Power Dissipation [3]	P_D	Overload	TC = 25°C		8.0		8.0	W
		Short Circuit			6.0		6.0	
Switching Frequency	F_S	I_{OUT} = 2000mA (main)		225	275	225	275	KHz
		I_{OUT} = ±167mA (dual)						
Inhibit Open Circuit Voltage	V_{OI}			9.0	13	9.0	13	V

Notes to Specifications

1. Tested at each output.
2. Parameter guaranteed by line and load regulation tests.
3. At least 20 percent of the total output power should be taken from the (+5V) main output.
4. Bandwidth guaranteed by design. Tested for 20KHz to 2.0MHz.
5. An overload is that condition with a load in excess of the rated load but less than that necessary to trigger the short circuit protection and is the condition of maximum power dissipation.
6. Above 85°C case temperature, derate output power linearly to 0 at 115°C case.

Specifications

T_{CASE} = -55°C to +105°C, V_{IN} = +28V ± 5% unless otherwise specified

Absolute Maximum Ratings		
Input voltage	-0.5V to +50VDC	
Power Output	Internally limited, 17.5W typical	
Soldering temperature	300°C for 10 seconds	
Temperature Range[6]	Operating case temperature	-55°C to +125°C
	Storage case temperature	-65°C to +135°C

TEST	SYMBOL	Condition -55°C ≤ T_C ≤ +105°C, V_{IN} = 28 V_{DC} ±5%, C_L=0 unless otherwise specified		ATO2812T/ES		ATO2815T/ES		Units
				Min	Max	Min	Max	
STATIC CHARACTERISTICS								
OUTPUT								
Voltage [1]	V_{OUT}	I_{OUT} = 0 (main)	TC = 25°C	4.95	5.05	4.95	5.05	V
			Over Temp	4.90	5.10	4.90	5.10	V
		I_{OUT} = 0 (dual)[1]	TC = 25°C	±11.88	±12.12	±14.85	±15.15	V
			Over Temp	±11.76	±12.24	±14.70	±15.30	V
Current [1,2,3]	I_{OUT}	V_{IN} = 16, 28, and 40 VDC (main)		0.0	2000	0.0	2000	mA
		V_{IN} = 16, 28, and 40 VDC (dual)[1]		0.0	±208	0.0	±167	mA
Ripple Voltage [1,4]	V_{RIP}	V_{IN} = 16, 28, and 40 VDC BW = DC to 2 MHz (main)			80		80	mVp-p
		V_{IN} = 16, 28, and 40 VDC BW = DC to 2 MHz (dual))			40		40	mVp-p
Power [1,2,3]	P_{OUT}	V_{IN} = 16, 28, and 40 VDC (main)		10		10		W
		(+dual)		2.5		2.5		W
		(-dual)		2.5		2.5		W
		(total)		15		15		W
REGULATION								
Line [1,3]	VR_{LINE}	V_{IN} = 16, 28, and 40 VDC I_{OUT} = 0, 1000, 2000mA (main)			25		25	
		V_{IN} = 16, 28, and 40 VDC (dual)	TC = 25°C		±30		±35	
		I_{OUT} = 0, ±84, ±167mA (dual)	Over Temp		±60		±75	mV
Load [1,3]	VR_{LOAD}	V_{IN} = 16, 28, and 40 VDC I_{OUT} = 0, 1000, 2000mA (main)			50		50	
		V_{IN} = 16, 28, and 40 VDC I_{OUT} = 0, ±84, ±167mA (dual)			±60		±75	
INPUT								
Current	I_{IN}	I_{OUT} = 0, Inhibit (pin 8) Tied to input return (pin 10)			15		15	mA
		I_{OUT} = 0, inhibit (pin 2) = open			40		40	mA
Ripple Current [4]	I_{RIP}	I_{OUT} = 2000 mA (main)			50		50	mAp-p
		I_{OUT} = ±167mA (dual) BW = DC to 2MHz						
EFFICIENCY	E_{FF}	I_{OUT} = 2000mA (main) I_{OUT} = ±167mA (dual) TC = ±25°C	TC = 25°C	76		76		%
ISOLATION	ISO	Input to output or any pin to case (except pin 7) at 500 VDC	TC = 25°C	100		100		MΩ
Load Fault Power Dissipation [3]	P_D	Overload, TC = +25°C[5]	TC = 25°C		8.0		8.0	W
		Short Circuit, TC = +25°C			6.0		6.0	
Switching Frequency	F_S	I_{OUT} = 2000mA (main) I_{OUT} = ±167mA (dual)		225	275	225	275	KHz
Inhibit Open Circuit Voltage	V_{OI}			9.0	13	9.0	13	V

Notes to Specifications

1. Tested at each output.
2. Parameter guaranteed by line and load regulation tests.
3. At least 20 percent of the total output power should be taken from the (+5V) main output.
4. Bandwidth guaranteed by design. Tested for 20KHz to 2.0MHz.
5. An overload is that condition with a load in excess of the rated load but less than that necessary to trigger the short circuit protection and is the condition of maximum power dissipation.
6. Above 105°C case temperature, derate output power linearly to 0 at 125°C case

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Specifications

T_{CASE} = -55°C to +125°C, V_{IN} = +28V ± 5% unless otherwise specified

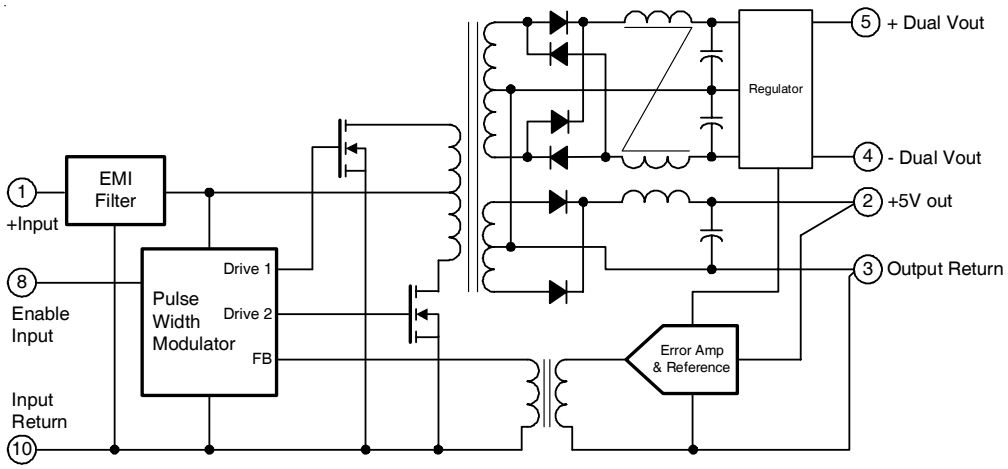
Absolute Maximum Ratings		
Input voltage	-0.5V to +50VDC	
Power Output	Internally limited, 17.5W typical	
Soldering temperature	300°C for 10 seconds	
Temperature Range[6]	Operating case temperature	-55°C to +135°C
	Storage case temperature	-65°C to +135°C

TEST	SYMBOL	Condition -55°C ≤ T_C ≤+125°C, V_{IN} = 28 V_{DC} ±5%, C_L=0 unless otherwise specified		ATO2812T/HB		ATO2815T/HB		Units
				Min	Max	Min	Max	
STATIC CHARACTERISTICS								
OUTPUT								
Voltage [1]	V_{OUT}	I_{OUT} = 0 (main)	TC = 25°C	4.95	5.05	4.95	5.05	V
			Over Temp	4.90	5.10	4.90	5.10	V
		I_{OUT} = 0 (dual)[1]	TC = 25°C	±11.88	±12.12	±14.85	±15.15	V
			Over Temp	±11.76	±12.24	±14.70	±15.30	V
Current [1,2,3]	I_{OUT}	V_{IN} = 16, 28, and 40 VDC (main)		0.0	2000	0.0	2000	mA
		V_{IN} = 16, 28, and 40 VDC (dual)[1]		0.0	±208	0.0	±167	mA
Ripple Voltage [1,4]	V_{RIP}	V_{IN} = 16, 28, and 40 VDC BW = DC to 2 MHz (main)			80		80	mVp-p
		V_{IN} = 16, 28, and 40 VDC BW = DC to 2 MHz (dual))			40		40	mVp-p
Power [1,2,3]	P_{OUT}	V_{IN} = 16, 28, and 40 VDC (main)		10		10		W
		(+dual)		2.5		2.5		W
		(-dual)		2.5		2.5		W
		(total)		15		15		W
REGULATION								
Line [1,3]	VR_{LINE}	V_{IN} = 16, 28, and 40 VDC I_{OUT} = 0, 1000, 2000mA (main)			25		25	
		V_{IN} = 16, 28, and 40 VDC (dual)	TC = 25°C		±30		±35	
		I_{OUT} = 0, ±84, ±167mA (dual)	Over Temp		±60		±75	mV
Load [1,3]	VR_{LOAD}	V_{IN} = 16, 28, and 40 VDC I_{OUT} = 0, 1000, 2000mA (main)			50		50	
		V_{IN} = 16, 28, and 40 VDC I_{OUT} = 0, ±84, ±167mA (dual)			±60		±75	
INPUT								
Current	I_{IN}	I_{OUT} = 0, Inhibit (pin 8) Tied to input return (pin 10)			15		15	mA
		I_{OUT} = 0, inhibit (pin 2) = open			40		40	mA
Ripple Current [4]	I_{RIP}	I_{OUT} = 2000 mA (main) I_{OUT} = ±167mA (dual) BW = DC to 2MHz			50		50	mAp-p
EFFICIENCY	E_{FF}	I_{OUT} = 2000mA (main) I_{OUT} = ±167mA (dual) TC = ±25°C	TC = 25°C	76		76		%
ISOLATION	ISO	Input to output or any pin to case (except pin 7) at 500 VDC	TC = 25°C	100		100		MΩ
Load Fault Power Dissipation [3]	P_D	Overload, TC = +25°C[5]	TC = 25°C		8.0		8.0	W
		Short Circuit, TC = +25°C			6.0		6.0	
Switching Frequency	F_S	I_{OUT} = 2000mA (main) I_{OUT} = ±167mA (dual)		225	275	225	275	KHz
Inhibit Open Circuit Voltage	V_{OI}			9.0	13	9.0	13	V

Notes to Specifications

1. Tested at each output.
2. Parameter guaranteed by line and load regulation tests.
3. At least 20 percent of the total output power should be taken from the (+5V) main output.
4. Bandwidth guaranteed by design. Tested for 20KHz to 2.0MHz.
5. An overload is that condition with a load in excess of the rated load but less than that necessary to trigger the short circuit protection and is the condition of maximum power dissipation.
6. Above 125°C case temperature, derate output power linearly to 0 at 135°C case

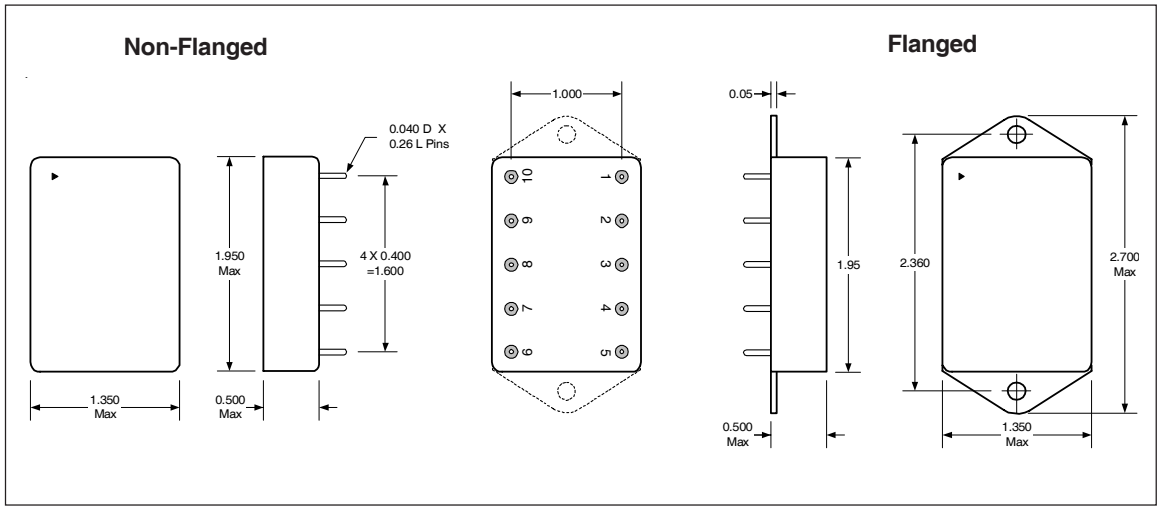
Block Diagram



Standard Microcircuit Drawing Equivalence Table

Standard Microcircuit Drawing Number	Vendor Cage Code	IR Standard Part Number
5962-90954	52467	ATO2815T
5962-91602	52467	ATO2812T

Mechanical Outlines



Pin Designation

Pin #	Designation
1	+ Input
2	+5V Output
3	Output Return
4	- Dual Output
5	+ Dual Output
6	NC
7	Case Ground
8	Enable Input
9	NC
10	Input Return

Device Screening

Requirement	MIL-STD-883 Method	No Suffix	ES ②	HB	CH
Temperature Range	—	-20°C to +85°C	-55°C to +125°C ③	-55°C to +125°C	-55°C to +125°C
Element Evaluation	MIL-PRF-38534	N/A	N/A	N/A	Class H
Non-Destructive Bond Pull	2023	N/A	N/A	N/A	N/A
Internal Visual	2017	①	Yes	Yes	Yes
Temperature Cycle	1010	N/A	Cond B	Cond C	Cond C
Constant Acceleration	2001, Y1 Axis	N/A	500 Gs	3000 Gs	3000 Gs
PIND	2020	N/A	N/A	N/A	N/A
Burn-In	1015	N/A	48 hrs@hi temp	160 hrs@125°C	160 hrs@125°C
Final Electrical (Group A)	MIL-PRF-38534 & Specification	25°C	25°C ②	-55°C, +25°C, +125°C	-55°C, +25°C, +125°C
PDA	MIL-PRF-38534	N/A	N/A	N/A	10%
Seal, Fine and Gross	1014	Cond A	Cond A, C	Cond A, C	Cond A, C
Radiographic	2012	N/A	N/A	N/A	N/A
External Visual	2009	①	Yes	Yes	Yes

Notes:
① Best commercial practice
② Sample tests at low and high temperatures
③ -55°C to +105°C for AHE, ATO, ATW

Part Numbering

ATO 28 15 T F /CH

- **Model**
- **Input Voltage Nominal**
  28 = 28V
- **Output Voltage**
  12 = 5V ±12V
  15 = 5V ±15V
- **Output**
  T = Triple
- **Package Style**
  F = Flange
  Blank = Non-Flanged
- **Screening Level**
  (Please refer to Screening Table)
  No Suffix, ES, HB, CH

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WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, Tel: (310) 252-7105
IR SANTA CLARA: 2270 Martin Av., Santa Clara, California 95050, Tel: (408) 727-0500
Visit us at www.irf.com for sales contact information.