PICO Electronics

SERIES FR/SFR
SURFACE MOUNT and PLUG-IN

Highly Regulated
Hi Reliability
Isolated
Ultraminiature DC-DC Converters

Low Profile .5" x 1" x .3" ht. up to 1 Watt
No Heat Sink or Electrical Derating Required

This series of encapsulated converters come in 60 different models. The highly regulated output is isolated from the input. The units will operate over the temperature range of -25º C to +70º C. No heat sink is required. These units are excellent for applications where the input voltage varies ±10% and the output must be held to ±0.1% single/and ±0.2% dual. The output voltage is maintained to within 0.2% from no load to full load for single and 0.4% for dual.

OPTIONS AVAILABLE

- Per Mil. Std. 883
- Expanded operating temp (-55º C to +85ºC)
- Stabilization Bake (125º C ambient)
- Temperature Cycle (-55º C to +125º C)
- Hi Temp, full power burn in (100% power, 125º C case temp)

FEATURES

- Excellent voltage regulations ±0.1% single / ±0.2% dual
- Encapsulated semiconductors, conservatively rated for maximum reliability
- Excellent load regulations 0.2% single / 0.4% dual
- Up to 1.0 watts output power at 70º C ambient
- Low output ripple
- 100 megohm 500V DC isolation
- Single and dual isolated outputs
- Low profile, ultra-miniature size
- No output capacitor required
- No heat sink required

TYPICAL CHARACTERISTICS:

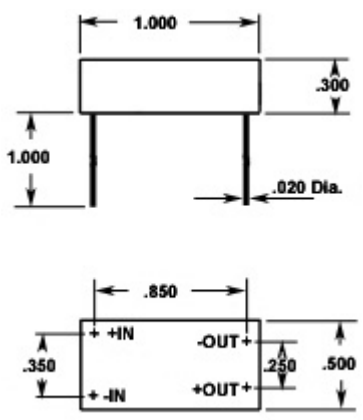
- **Test conditions:** 25º C ambient.
  Output voltage tolerance:±1% single / ±2% dual
  Line regulations: ±0.1% single/±0.2% dual (for the input voltage range of ±10%)
  Load regulation: 0.2% single/0.4% dual
  Converter frequency: 20-40 KHz
  Operating temperature: -25º C to +70º C ambient.
  Output voltage temperature coefficient: 0.01%/ºC
  Storage temperature: -55º C to +125º C
  Isolation: 100 megohms minimum at 500 volts DC
  Short circuit protection: Temporary

SERIES FR/SFR - SINGLE OUTPUT

PICO Plug-In Part Number	PICO Surface Mount Part Number	*Input Volt. (V DC)	Output Volt. (V DC)	Max. Load Current (mA)	Max. Output Power (watts)	Eff. @ Full Load at Nominal Input Volt. Typical (%)	Input Current @ Full Load Typical (mA) at Nominal Input Volt.	Output Volt. Ripple @Full Load (mVp-p) max.	Input Current @ No Load Typical at Nominal Input Volt. (mA)	Eff @ Full Load Typical (%)		Price (US $)
										High Line	Low Line	
5FR5S	5SFR5S	5	5	150	0.75	37	405	75	88	34	42	108.80
5FR12S	5SFR12S	5	12	83	1.00	50	400	50	88	45	56	108.80
5FR15S	5SFR15S	5	15	67	1.00	51	392	50	86	45	57	108.80
12FR5S	12SFR5S	12	5	150	.75	42	149	75	27	38	48	108.80
12FR12S	12SFR12S	12	12	83	1.00	53	157	50	32	47	60	108.80
12FR15S	12SFR15S	12	15	67	1.00	55	152	50	34	49	62	108.80
15FR5S	15SFR5S	15	5	150	0.75	42	119	75	22	38	48	108.80
15FR12S	15SFR12S	15	12	83	1.00	53	126	50	26	47	60	108.80
15FR15S	15SFR15S	15	15	67	1.00	55	121	50	27	49	62	108.80

24FR5S	24SFR5S	24	5	150	0.75	41	76	75	16	37	47	108.80
24FR12S	24SFR12S	24	12	83	1.00	51	82	50	19	45	58	108.80
24FR15S	24SFR15S	24	15	67	1.00	54	77	50	19	47	61	108.80
28FR5S	28SFR5S	28	5	150	0.75	41	65	75	16	32	40	108.80
28FR12S	28SFR12S	28	12	83	1.00	51	70	50	19	40	50	108.80
28FR15S	28SFR15S	28	15	67	1.00	54	66	50	19	41	52	108.80
*Input voltage ± 10%												

FR Single

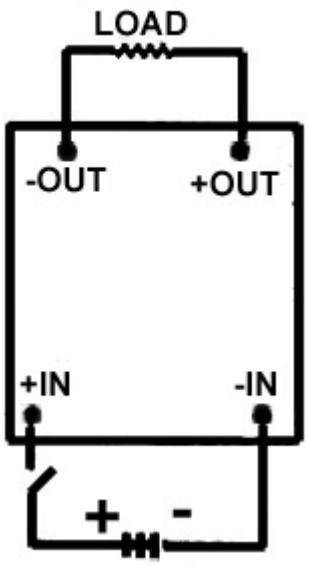


BOTTOM VIEW

Typical Weight: 10 grams
All measurements are in inches.

Larger Size Drawing [1]

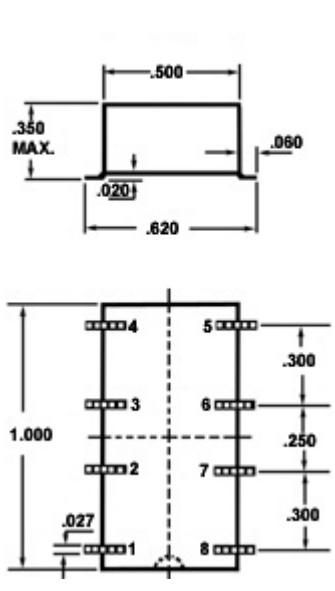
FR/SFR



Larger Size Schematic [2]

Pin no.	Single
1	+INP
2	N/C
3	N/C
4	-OUT
5	+OUT
6	N/C
7	N/C
8	-INP

SFR Single



BOTTOM VIEW

Typical Weight: 10 grams
All measurements are in inches

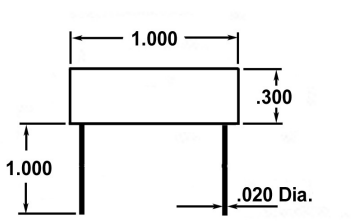
Larger Size Drawing [3]

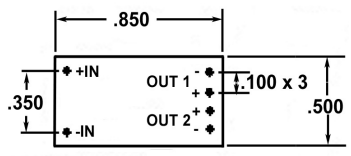
SERIES FR/SFR - DUAL OUTPUT

PICO Plug-In Part Number	PICO Surface Mount Part Number	*Input Volt. (V DC)	Output Volt. (V DC)	Max. Load Current per Output (mA)	Max. Output Power per Output (watts)	Eff. @ Full Load at Nominal Input Volt. Typical (%)	Input Current @ Full Load Typical (mA) at Nominal Input Volt.	Output Volt. Ripple @Full Load (mVp-p) max.	Input Current @ No Load Typical at Nominal Input Volt. (mA)	Eff @ Full Load Typical (%)		Price (US $)
										HIGH LINE	LOW LINE	
5FR5D	5SFR5D	5	5	50	0.25	37	270	50	100	34	42	145.34
5FR12D	5SFR12D	5	12	29	0.35	42	333	50	100	38	48	145.34
5FR15D	5SFR15D	5	15	23	0.35	45	311	50	120	41	52	145.34
12FR5D	12SFR5D	12	5	50	0.25	40	104	50	32	36	45	145.34
12FR12D	12SFR12D	12	12	29	0.35	49	119	50	39	44	55	145.34
12FR15D	12SFR15D	12	15	23	0.35	49	119	50	35	44	55	145.34
15FR5D	15SFR5D	15	5	50	0.25	40	83	50	26	36	45	145.34
15FR12D	15SFR12D	15	12	29	0.35	49	95	50	33	44	55	145.34
15FR15D	15SFR15D	15	15	23	0.35	49	95	50	30	44	55	145.34
24FR5D	24SFR5D	24	5	50	0.25	39	53	50	18	35	44	145.34
24FR12D	24SFR12D	24	12	29	0.35	46	63	50	22	41	52	145.34
24FR15D	24SFR15D	24	15	23	0.35	47	62	50	22	42	53	145.34
28FR5D	28SFR5D	28	5	50	0.25	40	45	50	18	31	39	145.34
28FR12D	28SFR12D	28	12	29	0.35	46	54	50	22	36	45	145.34
28FR15D	28SFR15D	28	15	23	0.35	47	53	50	22	36	45	145.34

*Input voltage ± 10%

FR Dual



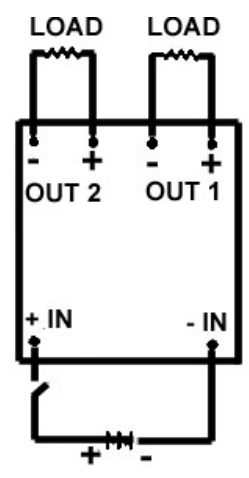


BOTTOM VIEW

Typical Weight: 10 grams
All measurements are in inches

Larger Size Drawing [4]

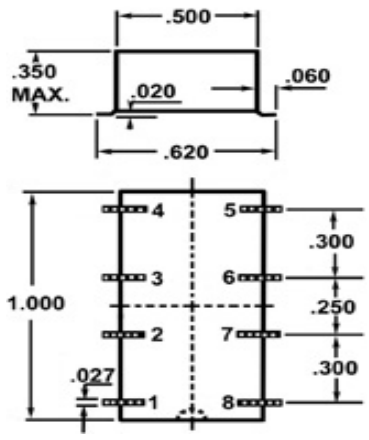
FR/SFR Dual



Larger Size Schematic [5]

Pin no.	Dual
1	+INP
2	N/C
3	+OUT2
4	-OUT2
5	-OUT1
6	+OUT1
7	N/C
8	-INP

SFR DUAL

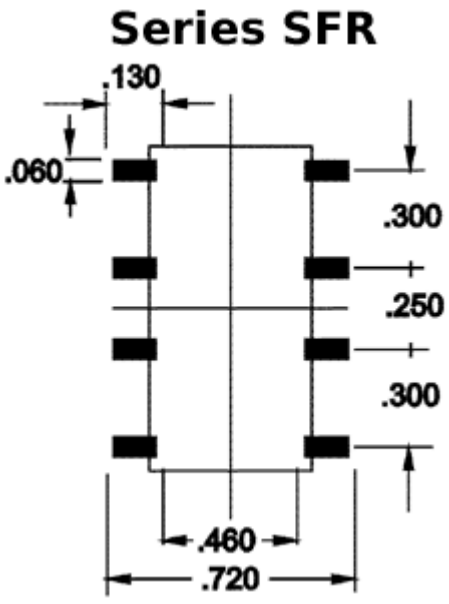


BOTTOM VIEW

Typical Weight: 10 grams
All measurements are in inches

Larger Size Drawing [6]

RECOMMENDED LAND PATTERN DIMENSIONS



Ordering Instructions:

- No minimum.
  Net 30 days F.O.B. Pelham, NY

  Delivery--stock to one week for sample orders.

For immediate engineering assistance or to place an order:
Call Toll Free: 800-431-1064

PICO Electronics, Inc.

143 Sparks Ave. Pelham, NY 10803
Tel: 914-738-1400 or Fax: 914-738-8225
