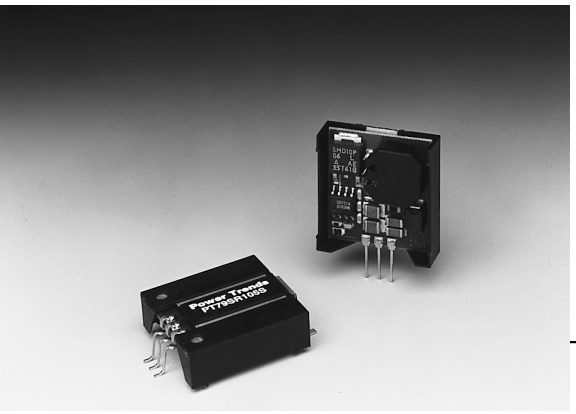
PT79SR100 Series

-1.5 Amp Negative Step-Down Integrated Switching Regulator

Power Trends Products from Texas Instruments

SLTS061A

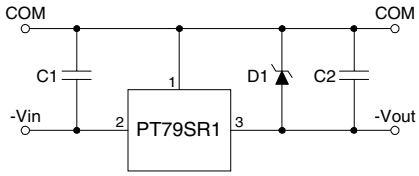
(Revised 6/30/2000)



- High Efficiency > 85%
- Self-Contained Inductor
- Short Circuit Protection
- Over-Temperature Protection

The PT79SR100 is a line of Negative Input/Negative Output 3-terminal Integrated Switching Regulators (ISRs). These ISRs have a maximum output current of -1.5 Amps and an output voltage that is laser trimmed to most industry standard voltages. They have excellent line and load regulation, and are ideal for applications, such as RS232 and Ethernet communications, ECL logic, and op-amp circuitry.

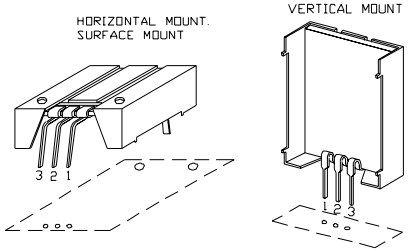
Standard Application



C1 = Optional ceramic (1µF)
C2 = Optional ceramic (1-5µF)
D1 = Zener diode required to clamp turn-on overshoot (See Application Note)

Pin-Out Information

Pin	Function
1	GND
2	$-V_{in}$
3	$-V_{out}$



Pkg Style 500

Ordering Information

PT79SR1 XX Y

Output Voltage	Package Suffix
05 = -5.0 Volts	**V** = Vertical Mount
52 = -5.2 Volts	**S** = Surface Mount
06 = -6.0 Volts	**H** = Horizontal Mount
08 = -8.0 Volts	
09 = -9.0 Volts	
12 = -12.0 Volts	
15 = -15.0 Volts	

Specifications

Characteristics (T_a = 25°C unless noted)	Symbols	Conditions	PT79SR100 SERIES Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	-0.1*	—	-1.5	A
Short Circuit Current	I_{sc}	V_{in}=V_o-4V	—	-3.5	—	Apk
Input Voltage Range	V_{in}	I_o=-0.1 to -1.5 A V_o=-5V -0.1 ≥ I_o ≥ -1.5 A V_o=-15V	-9 -19	— —	-30 -30	V V
Output Voltage Tolerance	ΔV_o	Over Vin range, I_o=-1.5 A T_a=-20°C to shutdown	—	±1.0	±3.0	%V_o
Line Regulation	Reg_{line}	Over V_{in} range	—	±1.0	±2.0	%V_o
Load Regulation	Reg_{load}	-0.1 ≤ I_o ≤ -1.5 A	—	±0.5	±1.0	%V_o
V_o Ripple/Noise	V_n	V_{in}=-15V, I_o=-1.0 A,V_o=-5V	—	35	—	mV_{pp}
Transient Response	t_{tr}	50% load change V_o=overshoot/undershoot	— —	100 30	— —	µSec %V_o
Efficiency	η	V_{in}=-10V, I_o=-1.0A, V_o=-5V	—	85	—	%
Switching Frequency	f_o	Over V_{in} and I_o ranges	0.95	1.0	1.05	MHz
Absolute Maximum Operating Temperature Range	T_a		-40	—	+85	°C
Recommended Operating Temperature Range	T_a	Free Air Convection, (40-60LFM) Over V_{in} and I_o ranges	-40	—	+60**	°C
Thermal Resistance	θ_{ja}	Free Air Convection, (40-60LFM)	—	45	—	°C/W
Temperature Coefficient	T_c	Over V_{in} and I_o ranges	—	±0.5	±1.5	mV/°C
Storage Temperature	T_s	—	-40	—	+125	°C
Mechanical Shock	—	Per Mil-STD-883D, Method 2002.3	—	500	—	G's
Mechanical Vibration	—	Per Mil-STD-883D, Method 2007.2, 20-2000 Hz, soldered in a PC board	—	5	—	G's
Weight	—	—	—	7.0	—	Grams

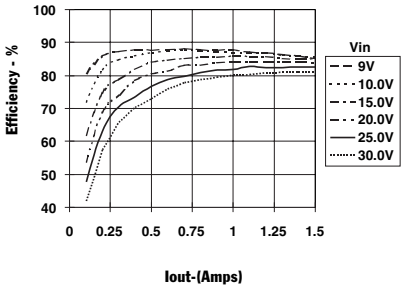
* ISR will operate down to no load with reduced specifications.

** See Thermal Derating chart.

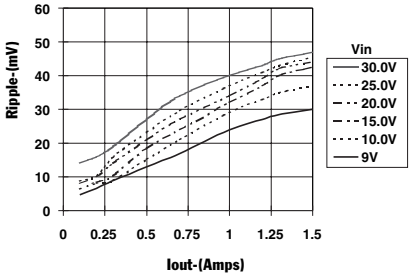
Typical Characteristics

PT79SR105, -5.0 VDC (See Note 1)

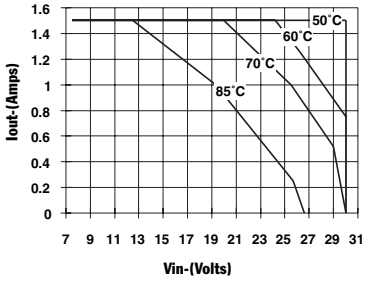
Efficiency vs Output Current



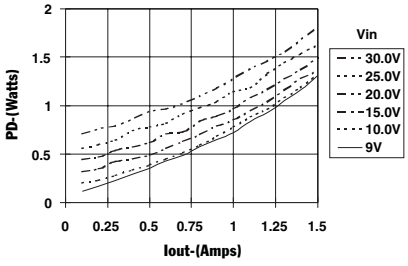
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)

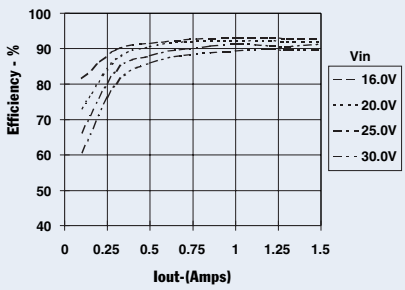


Power Dissipation vs Output Current

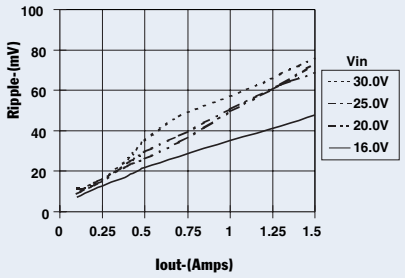


PT79SR112, -12.0 VDC (See Note 1)

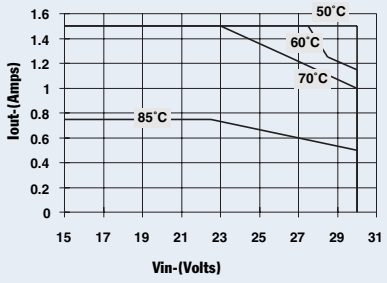
Efficiency vs Output Current



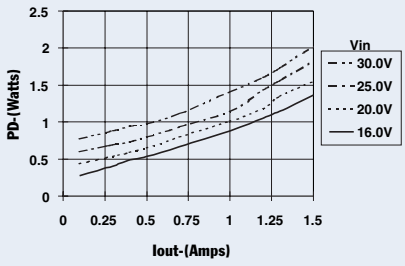
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)

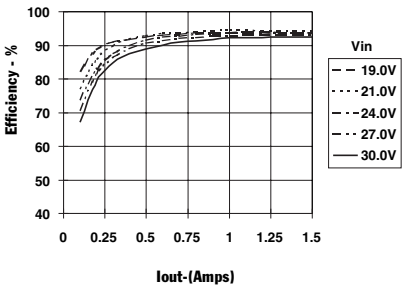


Power Dissipation vs Output Current

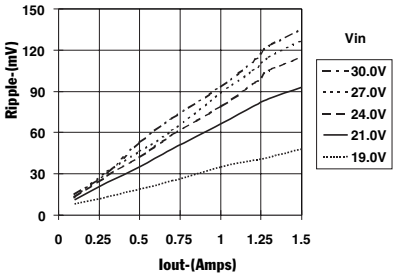


PT79SR115, -15.0 VDC (See Note 1)

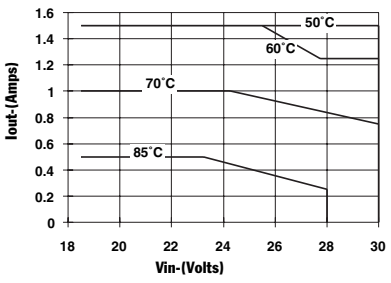
Efficiency vs Output Current



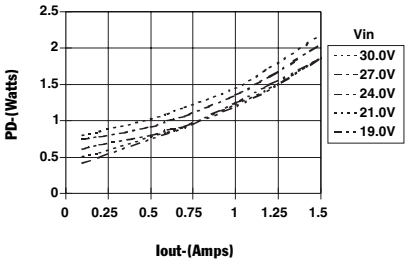
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)



Power Dissipation vs Output Current



Note 1: *All data listed in the above graphs, except for derating data, has been developed from actual products tested at 25°C. This data is considered typical data for the ISR.*
Note 2: *Thermal derating graphs are developed in free air convection cooling of 40-60 LFM soldered in a printed circuit board. (See Thermal Application Notes.)*

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
PT79SR105H	ACTIVE	SIP MOD ULE	EFA	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR105S	ACTIVE	SIP MOD ULE	EFC	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR105T	ACTIVE	SIP MOD ULE	EFT	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR105V	ACTIVE	SIP MOD ULE	EFD	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR106S	ACTIVE	SIP MOD ULE	EFC	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR108H	ACTIVE	SIP MOD ULE	EFA	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR108S	ACTIVE	SIP MOD ULE	EFC	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR108V	ACTIVE	SIP MOD ULE	EFD	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR109H	ACTIVE	SIP MOD ULE	EFA	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR109S	ACTIVE	SIP MOD ULE	EFC	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR112H	ACTIVE	SIP MOD ULE	EFA	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR112S	ACTIVE	SIP MOD ULE	EFC	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR112T	ACTIVE	SIP MOD ULE	EFT	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR112V	ACTIVE	SIP MOD ULE	EFD	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR115H	ACTIVE	SIP MOD ULE	EFA	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR115S	ACTIVE	SIP MOD ULE	EFC	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR115T	ACTIVE	SIP MOD ULE	EFT	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR115V	ACTIVE	SIP MOD ULE	EFD	3	25	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT79SR152H	ACTIVE	SIP MOD ULE	EFA	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR152S	ACTIVE	SIP MOD ULE	EFC	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR152ST	ACTIVE	SIP MOD ULE	EFC	3	200	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT79SR152V	ACTIVE	SIP MOD ULE	EFD	3	25	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM

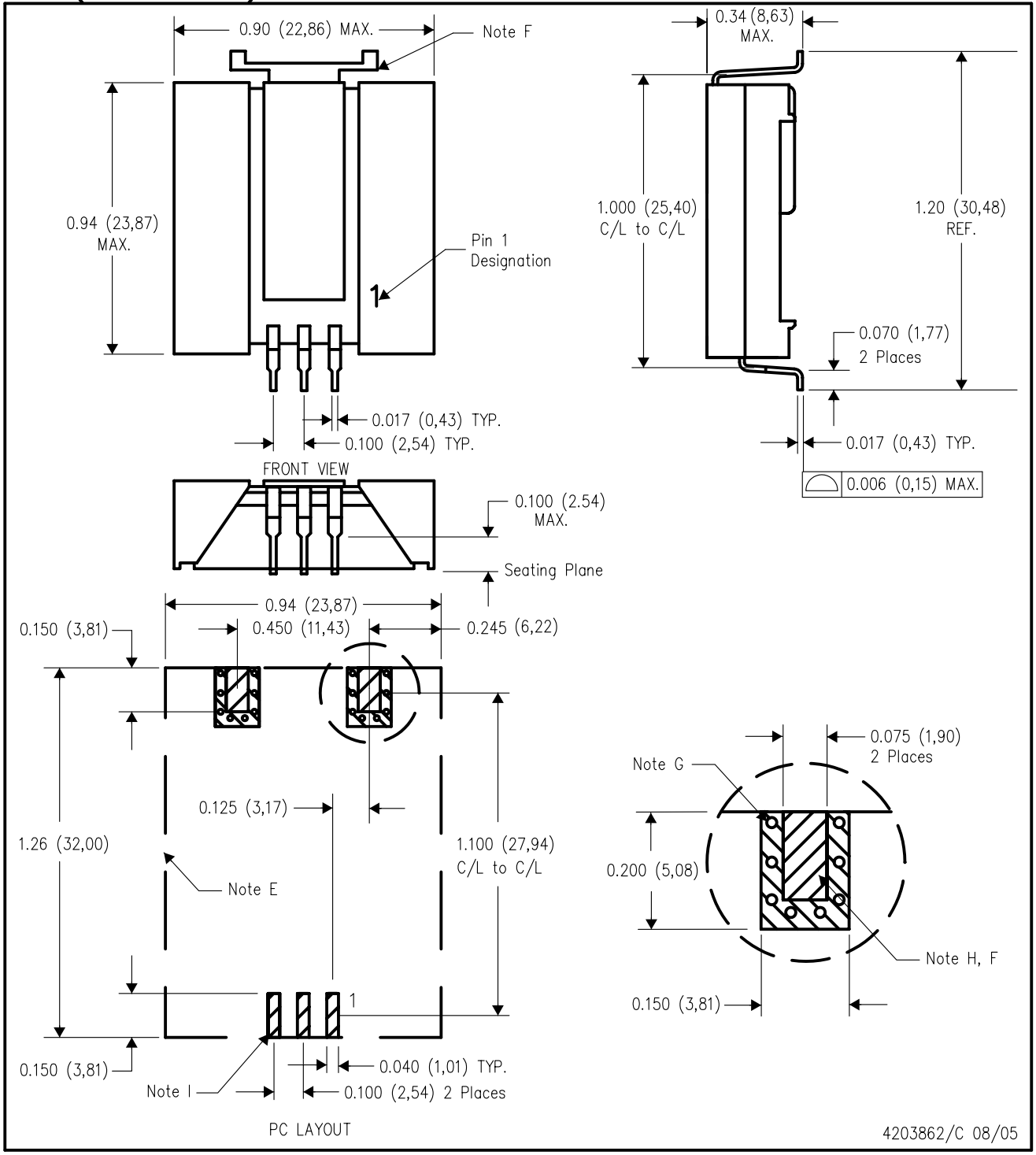
(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

EFC (R–PSIP–G3) PLASTIC SINGLE–IN–LINE MODULE



NOTES:
A. All linear dimensions are in inches (mm).
B. This drawing is subject to change without notice.
C. 2 place decimals are ±0.030 (±0,76mm).
D. 3 place decimals are ±0.010 (±0,25mm).
E. Recommended mechanical keep out area.
F. The 2 pin tab is electrically isolated and can be grounded.
G. Vias are recommended to improve copper adhesion.
H. Solder mask openings to copper island for solder joints to mechanical pins.
I. Power pin connections should utilize two or more vias per input, ground and output pin.

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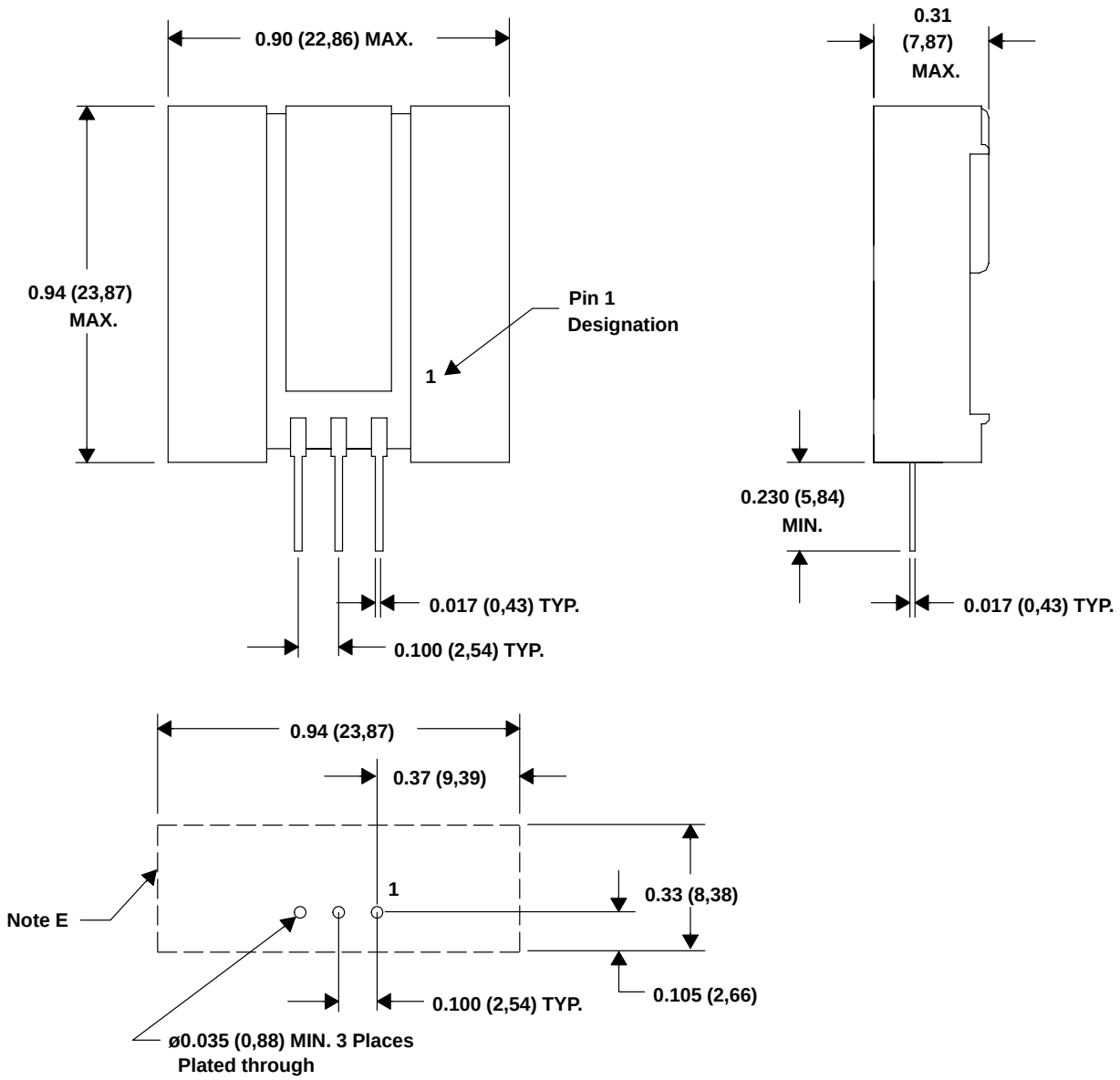
EFD (R–PSIP–T3) **PLASTIC SINGLE-IN-LINE MODULE**

Suffix V

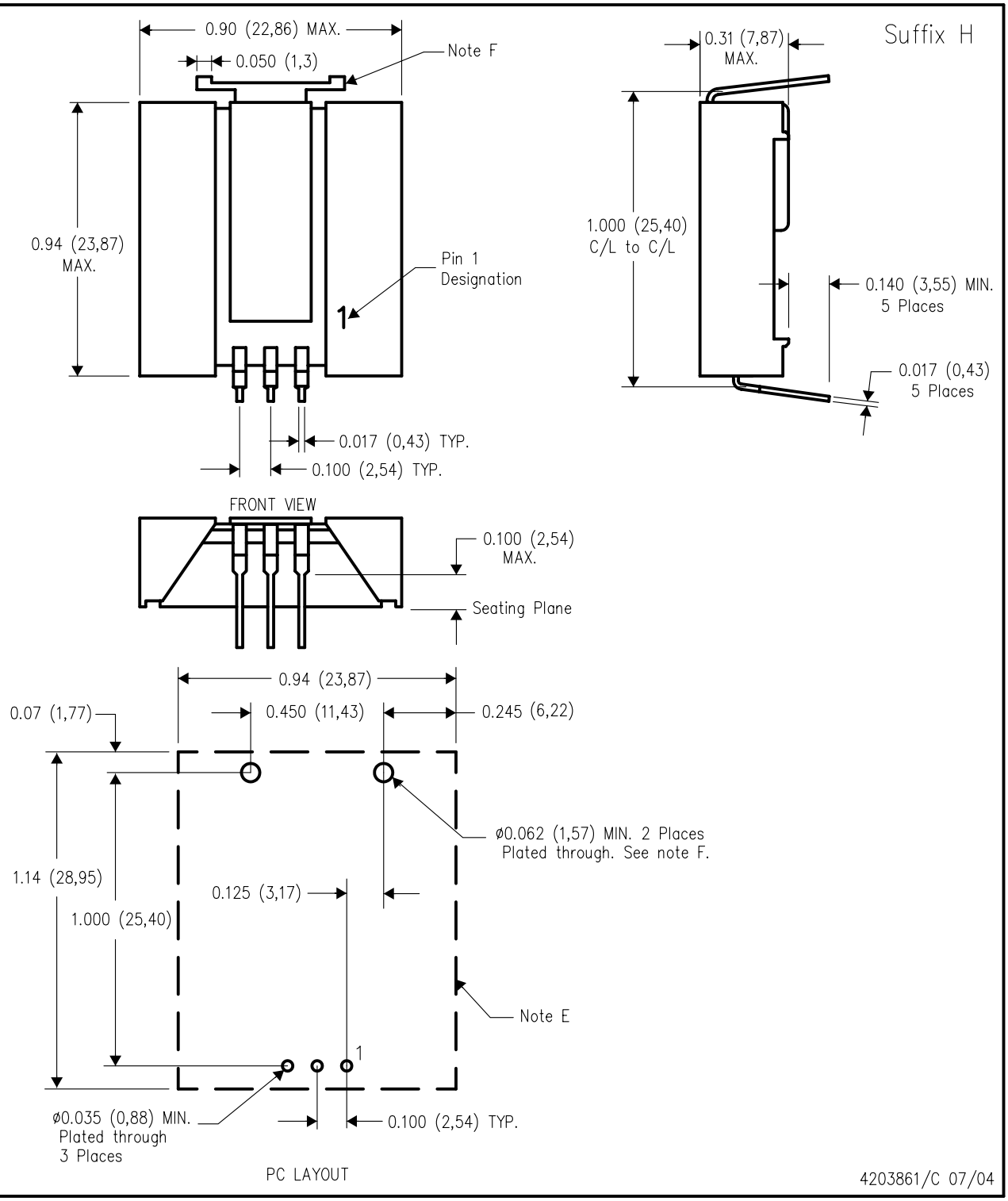


PC LAYOUT

4203860/A 09/01

NOTES: A. All linear dimensions are in inches (mm).
B. This drawing is subject to change without notice.
C. 2 place decimals are ±0.030 (±0,76mm).
D. 3 place decimals are ±0.010 (±0,25mm).
E. Recommended mechanical keep out area.

EFA (R–PSIP–T3) PLASTIC SINGLE–IN–LINE MODULE



NOTES:
A. All linear dimensions are in inches (mm).
B. This drawing is subject to change without notice.
C. 2 place decimals are ±0.030 (±0,76mm).
D. 3 place decimals are ±0.010 (±0,25mm).
E. Recommended mechanical keep out area.
F. The 2 pin tab is electrically isolated and can be grounded.

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