75PS4 – DC/DC Converter, 3U, cPCI

The 75PS4 is a small, lightweight, versatile and extremely reliable Power Supply. It implements an innovative architecture and uses the latest technology to provide an extremely robust solution to the difficult problem of supplying clean power to upstream electronics, while operating over extreme conditions.

The 75PS4 employs a dual microprocessor controlled design, which is powered by an independent bias supply and powered-up before any other converters. The processors then sequence the supplies one at a time, making sure each is working properly before the next converter is initialized. The processors continuously monitor all of the converters voltages, currents and temperatures, and shut down the appropriate sections of the supply, if a fault occurs. This not only limits damage to the upstream electronics, but also to the supply itself.

Features

- Single Slot 0.8” Pitch, 3U Package
- IEEE 1101.2 compliant
- Standard PCI 47 Pin Connector and I/O per PICMG 2.11
- High Efficiency
- Full Output Power at +85°C Temperature
- Wide Input Range
- Transient Protection per MIL-STD-704A through F
- Mil-STD-1275AT (Optional)
- EMI Filtering Designed to MIL-STD-461; CE102
- Remote Sensing
- Holdup Time
- Continuous BIT Monitoring
- I^2C Communication
- High Altitude Operation
- Extremely Low No-Load Power (5W for 150W Version, 4W for 75W Version)

Electrical Specifications

Input Characteristics:	
Input	+28Vdc Nominal (+15 to +50Vdc Continuous)
EMI/RFI Characteristics	Designed to meet requirements of MIL-STD-461F; CE102. For full system level compliance additional system filtering may be required
Input Transient Protection	Per MIL-STD-704A through F
	Per Mil-Std-1275 (+6vdc to +50Vdc) Includes 100Vdc and 250Vdc Transients Reverse Polarity Protection

DC Output Characteristics:	
Output Power	Programmable, See Output Table
Output Voltage	Programmable, See Output Table
Efficiency	85% Typical; refer to efficiency curves, sheet 9
Holdup Time	50 milliseconds, 150 Watts
Switching Frequency	275Khz
Line Regulation	Within 0.1% for low to high line changes at constant load
Load Regulation	0.1% for 0 to 100% of rated load at nominal input line
PARD (Noise and Ripple)	1% or 50mv p-p max (per VITA 62). Measurements are made with a 20 Mhz bandwidth instrument connected on load wires < 5 inches from power supply and terminated with 1uF capacitors across load lines
Load Transient Recovery	Output voltage returns to regulation limits within 0.5 msec, half to full load
Load Transient Under/Overshoot	5% of nominal output voltage set point (1.4v max); 2.5% for V3
Short Circuit Protection	Protected for continuous short circuit with automatic recovery
OverVoltage Protection	Automatic electronic shutdown if outputs exceed 125% ±10% (Fully Programmable)
OverCurrent Protection	Automatic electronic shutdown with Auto Recovery – Adjustable each converter ±10%, See Output Table
Remote Error Sensing	Sensing pins compensate for up to 0.5-volt drop on VS1 - VS3 outputs
Isolation Voltage	500 VDC input to output and input to case; 100 VDC output to case.
Insulation Resistance	50 Megohm at 500 VDC

Signal Types:	
INH#	*If the Inhibit is floating or tied to the positive input voltage the power supply turns on and provides output voltages.* *If the Inhibit is tied to the input RTN the power supply turns off.*
Vin_OK	*Indicates that the input to the power supply is between +15VDC to +50VDC. TTL compatible open collector. Active Low indicates that the input voltage is within specification.* *To complete the TTL circuit, the user should apply 10 mA max via a pull-up resistor to the Vin_OK pin using a maximum Vcc of 30 VDC.*
Vout_OK	*TTL compatible open collector. Active Low indicates that all of the output voltages are within specification. To complete the TTL circuit, the user should apply 10 mA max via a pull-up resistor to the Vout_OK pin using a maximum Vcc of 30 VDC.*
Holdup_Rdy	*Monitors whether or not Holdup Caps are charged and ready. TTL compatible open collector. To complete the TTL circuit, the user should apply 10 mA max via a pull-up resistor to the Holdup_Rdy pin using a maximum Vcc of 30 VDC.*
IPMB Compatible	(per PICMG 2.11 R1.0)
I^2C Communication	*Used for IPMB*

Physical/Environmental Specifications	
Temperature Range	Operating: -40°C to +85°C at 100% load (Temperature measured at card edge; conduction via card edge); Storage: -55°C to +100°C
Temperature Coefficient	0.01% per °C
Shock	MIL-STD-810G, Method 516.6, Proc. I
Vibration	Per MIL-STD-810G, Method 514.6, Procedure I
Acceleration	6 G's per MIL-STD-810G, Method 513.6, Procedure II
Humidity	95% non-condensing per MIL-STD-810G, Method 507.5
Altitude	70,000 feet per MIL-STD-810G, Method 500.5
Dimensions	See page 10
Salt/Fog	Per MIL-STD-810G, Method 509.5
Sand/Dust	Per MIL-STD-810G, Method 510.5, Procedures I and II
Fungus	Per MIL-STD-810G, Method 508.6
Enclosure	Aluminum housing to aluminum Baseplate
Finish	Chemical film IAW MIL-DTL-5541, Type II, Class 3
Interface	Per Connector Table
Weight	1.4 lbs. Max

Output Table

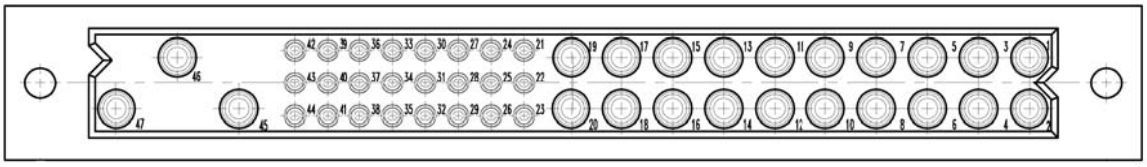
			75W*		150 W**	
Designation	Nominal Voltage	Programmable Voltage Range	Default Overcurrent Setpoint	Programmable Output Current Range	Default Overcurrent Setpoint	Programmable Output Current Range
V1	+5Vdc	+4.8 to +5.5Vdc	14 Amps	0 to 15Amps*	22 Amps	0 to 30Amps**
V2	+3.3Vdc	+3.0 to +3.6Vdc	12 Amps	0 to 12Amps*	12 Amps	0 to 12Amps**
V3	+12Vdc	+8.0 to +15.0Vdc	3.5 Amps	0 to 3.5Amps*	3.5 Amps	0 to 3.5Amps**
V4	-12Vdc	-8.0 to -15.0Vdc	3.5 Amps	0 to 3.5Amps*	3.5 Amps	0 to 3.5Amps**

* Total output power limited to 75 Watts

** Total output power limited to 150 Watts

Connectors

Connector	Part Number - Series
Unit Connector	PCIH47M400A1
Mating Connector	PCI47Fxx



Pinout Designations P1		
Pin #	**Signal Name**	**75PS4 Signal**
1-4	V1	V1 Output
5-12	RTN	V1 and V2 Return
13-18	V2	V2 Output
19	RTN	V3 Return
20	V3	V3 Output
21	V4	V4 Output
22	RTN	Signal Return
23	RESERVED	Reserved
24	RTN	V4 Return
25	RESERVED	Reserved
26	Holdup_RDY	Holdup Cap Charged/Ready
27	RESERVED	Reserved
28	RESERVED	Reserved
29	RESERVED	Reserved
30	V1 SENSE	V1 Remote Sense
31	RESERVED	Reserved
32	RESERVED	Reserved
33	V2 SENSE	V2 Remote Sense
34	S RTN	Sense Return
35	RESERVED	Reserved
36	V3 SENSE	V3 Remote Sense
37	IPMB_SCL	IPMB_SCL
38	Vout_OK	All outputs within spec
39	INH#	Inhibit
40	IPMB_SDA	IPMB_SDA
41	RESERVED	Reserved
42	Vin_OK	Input within +15Vdc to +50Vdc
43	IPMB_PWR	IPMB_PWR
44	RESERVED	Reserved
45	CGND	CGND
46	+DC IN	+DC IN
47	-DC IN	-DC IN

Ordering Information for 75PS4

PART NUMBER DESIGNATION

Standard Product = 75PS4-VWHOMTC

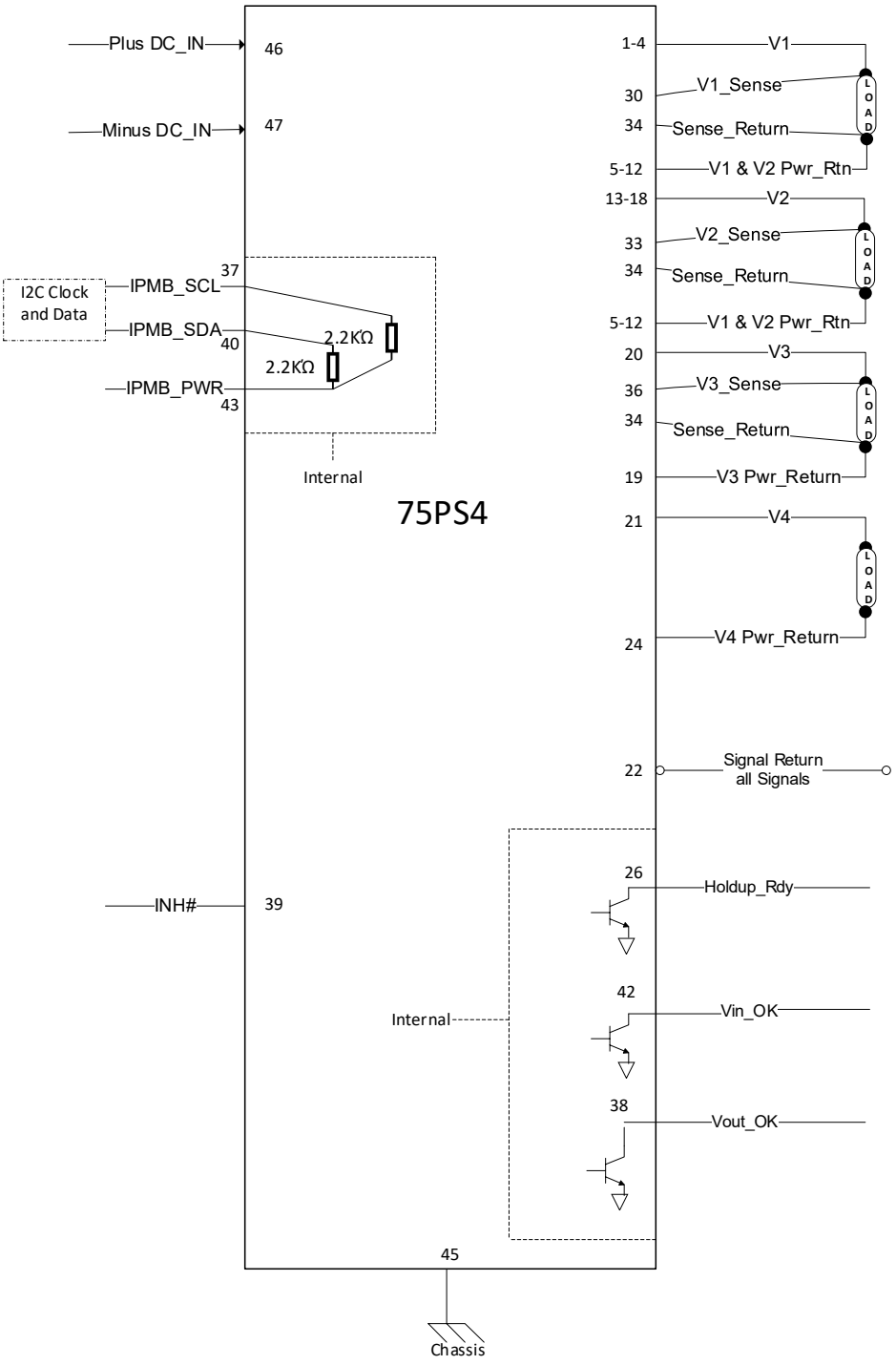
	V	W	H	O	M	T	C	See Table
Input Voltage **D** = DC/DC 28 VDC Input								
Watts **1** = 75 W **2** = 150 W								
Holdup **0** = No Holdup **H** = Holdup 50ms for 150Watts **R** = Holdup 50ms for 74 Watts (Non ITAR)								
Output Voltage (See Note) **0** = 5 V, ±12 V **2** = 5 V, ±12 V, 3.3 V **4 =** +5V, ±15V **1** = 5 V **3** = 5 V, 3.3 V								
Mechanical Options **W** = PICMG 2.11 47-Pin Connector with wedgelocks								
Temp/Environmental Options **H** = - 40°C to 85°C with Conformal Coating								
Connector **1** = Front MicroUSB Configuration Port								
Option Code **See Table Below**								

Specifications are subject to change without notice.

Note: Only the voltages listed for each option are available. All others are disabled.

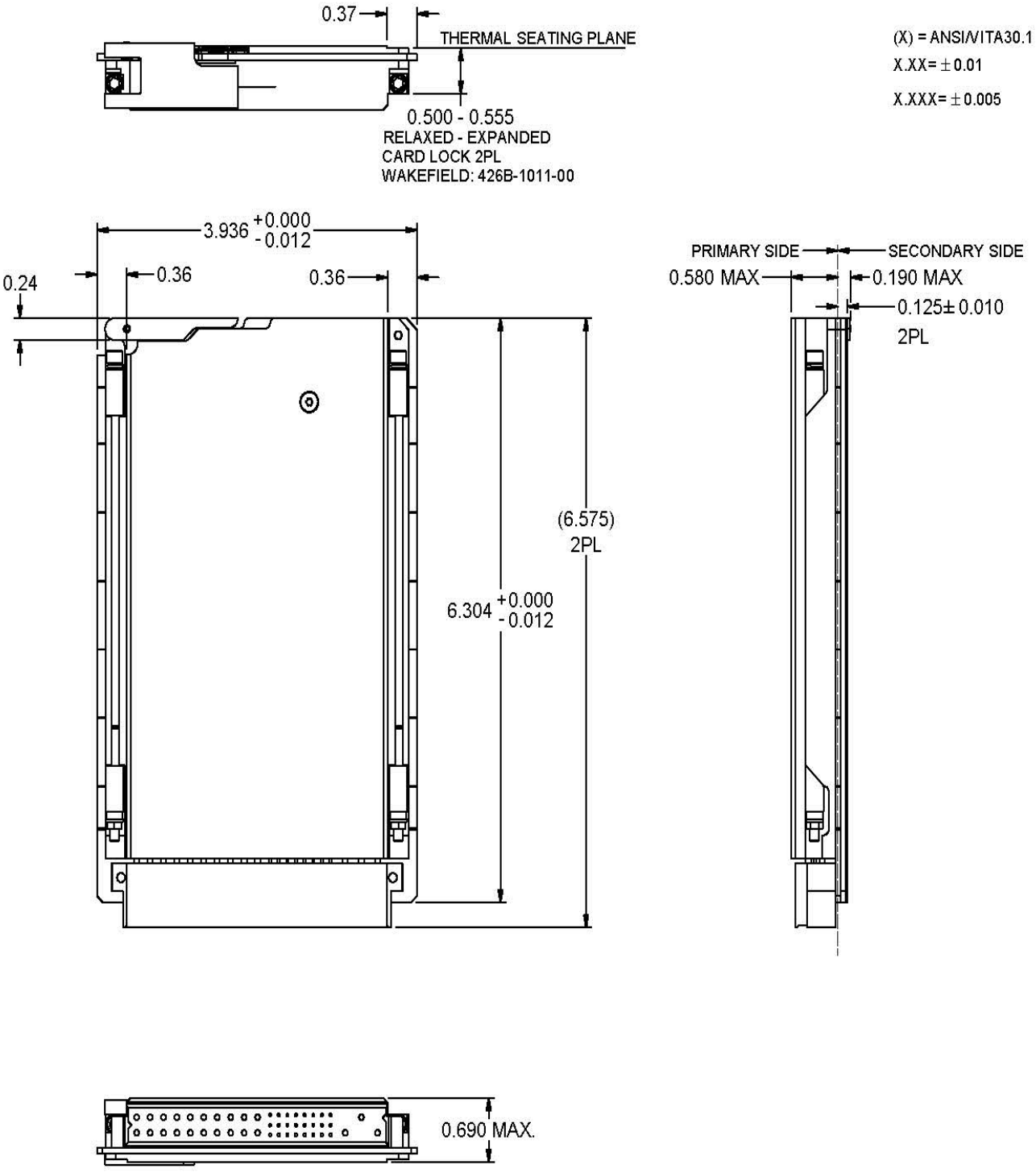
Option Codes	
Code	**Description**
01	+5Vdc output is factory set to +5.3Vdc
50	PSU provides 5V, +15, -15V regulated outputs. Full P/N 75PS4-D10WH1-5
RH	ROHS Compliant Version

75PS4 Simplified Connection Diagram



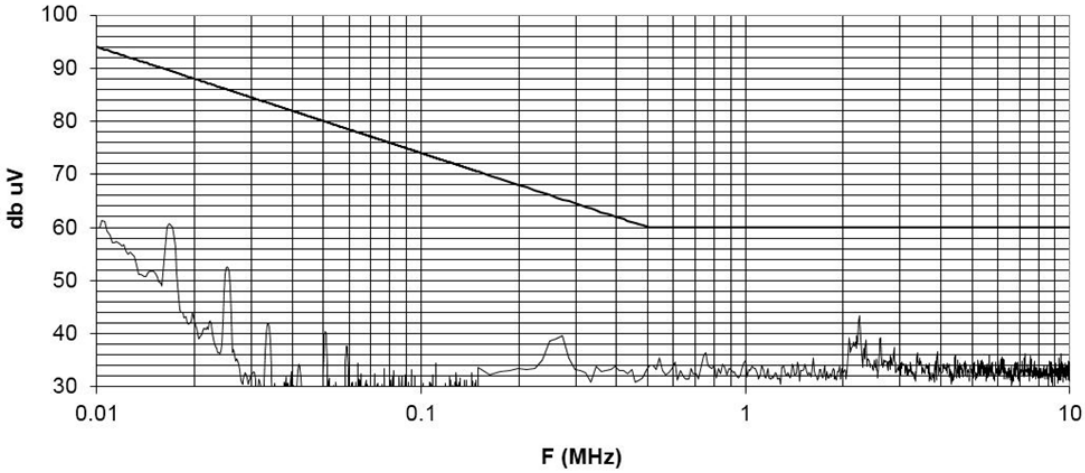
Reserved Pins
23, 25, 26, 27, 28, 29, 31, 32, 35, 41, 44

75PS4 Outline & Mechanical Dimensions

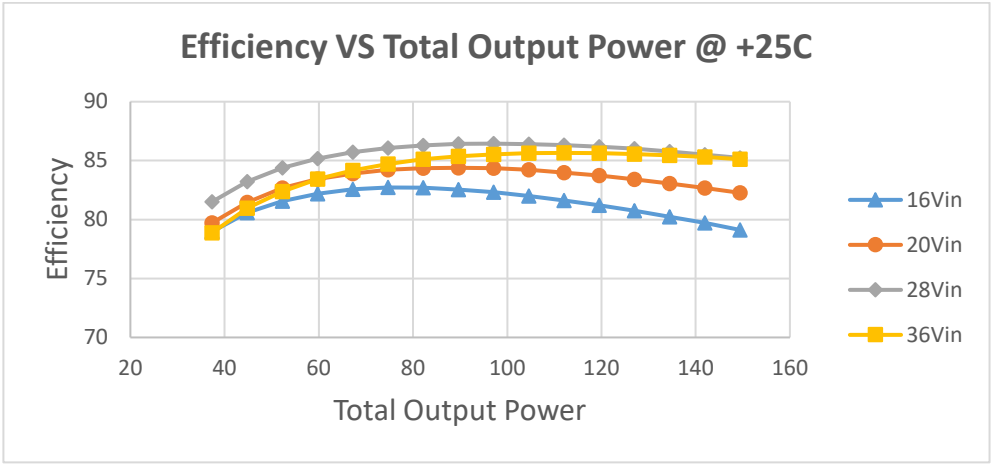


Performance Data

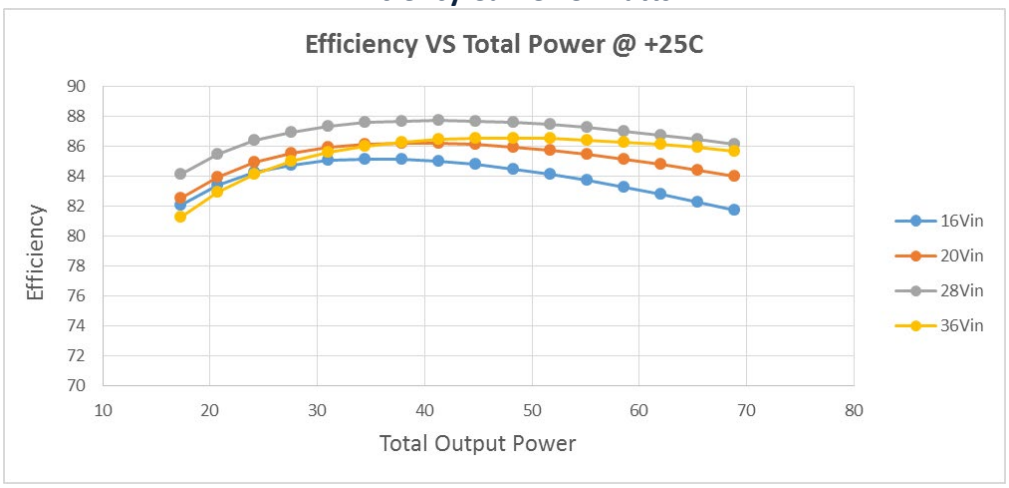
CE102 Scan at 150W Output Levels



Efficiency Curve 150 Watts



Efficiency Curve 75 Watts



Revision History

Revision	Change Made By	Date	Notes	Approved
1	Lou	05/05/14		
2	Paul F	06/05/14	ECO C02628	***PLM***
A	Lou G	03/30/15	ECO C03133	***PLM***
B	Lou Garofolo	05/12/15	ECO C03264	***PLM***
C	Lou Garofolo	07/02/15	ECO C03404	***PLM***
D	Lou Garofolo	02/16/16	ECO C03899	***PLM***
E	Lou Garofolo	05/20/16	ECO C04075	***PLM***
F	Lou Garofolo	08/24/16	ECO C04273	***PLM***
G	Lou Garofolo	06/05/18	ECO C05661	***PLM***
H	Lou Garofolo	01/15/19	ECO C06262	***PLM***
J	Lou Garofolo	09/26/19	ECO C06960	***PLM***
K	Lou Garofolo	10/19/21	ECO C08799	***PLM***
M	Lou Garofolo	02/07/22	ECO C09062	***PLM***