

REVISIONS

LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Changes in accordance with NOR 5962-R247-94.	94-07-25	K. A. Cottongim
B	Add case outlines T, U, Y, and Z.	98-02-23	K. A. Cottongim
C	Added device type 02. Updated table I for the addition of RadHard limits for the device type 02. Updated paragraph 4.3.5 to add the RadHard requirements. Redrew entire document. -sld.	02-06-21	Raymond Monnin



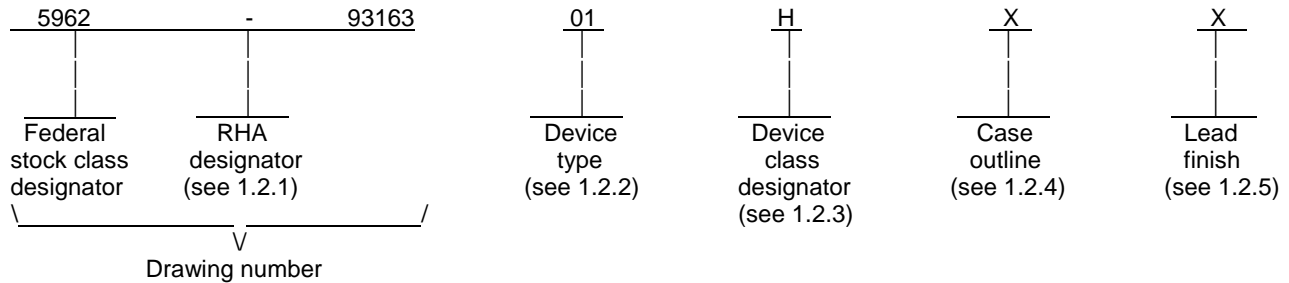
REV																			
SHEET																			
REV	C	C	C																
SHEET	15	16	17																
REV STATUS OF SHEETS	REV			C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
	SHEET			1	2	3	4	5	6	7	8	9	10	11	12	13	14		

PMIC N/A	PREPARED BY Steve Duncan	<p align="center">DEFENSE SUPPLY CENTER COLUMBUS POST OFFICE BOX 3990 COLUMBUS, OHIO 43216-5000 http://www.dsccl.dla.mil</p>													
<p align="center">STANDARD MICROCIRCUIT DRAWING</p> <p align="center">THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE</p> <p align="center">AMSC N/A</p>	CHECKED BY Michael C. Jones														
	APPROVED BY Kendall A. Cottongim	<p align="center">MICROCIRCUIT, HYBRID, LINEAR, 5 VOLT, SINGLE CHANNEL, DC-DC CONVERTER</p>													
	DRAWING APPROVAL DATE 94-05-25														
	REVISION LEVEL C		<table border="1"> <tr> <td>SIZE A</td> <td>CAGE CODE 67268</td> <td rowspan="2">5962-93163</td> </tr> <tr> <td colspan="2">SHEET 1 OF 17</td> </tr> </table>	SIZE A	CAGE CODE 67268	5962-93163	SHEET 1 OF 17								
SIZE A	CAGE CODE 67268	5962-93163													
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1. SCOPE

1.1 Scope. This drawing documents five product assurance classes as defined in paragraph 1.2.3 and MIL-PRF-38534. A choice of case outlines and lead finishes which are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of radiation hardness assurance levels are reflected in the PIN.

1.2 PIN. The PIN shall be as shown in the following example:



1.2.1 Radiation hardness assurance (RHA) designator. RHA marked devices shall meet the MIL-PRF-38534 specified RHA levels and shall be marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

1.2.2 Device type(s). The device type(s) identify the circuit function as follows:

<u>Device type</u>	<u>Generic number</u>	<u>Circuit function</u>
01	MFL2805S	DC-DC converter, 50 W, +5 V output
02	SMFL2805S	DC-DC converter, 50 W, +5 V output

1.2.3 Device class designator. This device class designator shall be a single letter identifying the product assurance level. All levels are defined by the requirements of MIL-PRF-38534 and require QML Certification as well as qualification (Class H, K, and E) or QML Listing (Class G and D). The product assurance levels are as follows:

<u>Device class</u>	<u>Device performance documentation</u>
K	Highest reliability class available. This level is intended for use in space applications.
H	Standard military quality class level. This level is intended for use in applications where non-space high reliability devices are required.
G	Reduced testing version of the standard military quality class. This level uses the Class H screening and In-Process Inspections with a possible limited temperature range, manufacturer specified incoming flow, and the manufacturer guarantees (but may not test) periodic and conformance inspections (Group A, B, C and D).
E	Designates devices which are based upon one of the other classes (K, H, or G) with exception(s) taken to the requirements of that class. These exception(s) must be specified in the device acquisition document; therefore the acquisition document should be reviewed to ensure that the exception(s) taken will not adversely affect system performance.
D	Manufacturer specified quality class. Quality level is defined by the manufacturers internal, QML certified flow. This product may have a limited temperature range.

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1.2.4 Case outline(s). The case outline(s) are as designated in MIL-STD-1835 and as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Package style</u>
T	See figure 1	12	Tabbed flange mount, lead formed up
U	See figure 1	12	Flange mount, lead formed down
X	See figure 1	12	Flange mount, short lead
Y	See figure 1	12	Tabbed flange mount, short lead
Z	See figure 1	12	Tabbed flange mount, lead formed down

1.2.5 Lead finish. The lead finish shall be as specified in MIL-PRF-38534.

1.3 Absolute maximum ratings. ^{1/}

Input voltage range ^{2/}	-0.5 V dc to +50 V dc
Power dissipation (P _D):	
Device types 01 and 02 (non-RHA)	18 W
Device type 02 (RHA level R)	20 W
Lead soldering temperature (10 seconds).....	+300°C
Storage temperature range	-65°C to +150°C

1.4 Recommended operating conditions.

Input voltage range (V _{IN}).....	+16 V dc to +40 V dc
Output power	≤ 50 W
Case operating temperature range (T _C)	-55°C to +125°C

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, and handbooks. The following specification, standards, and handbooks form a part of this drawing to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-38534 - Hybrid Microcircuits, General Specification for.

STANDARDS

DEPARTMENT OF DEFENSE

MIL-STD-883 - Test Method Standard Microcircuits.
 MIL-STD-1835 - Interface Standard for Electronic Component Case Outlines.

HANDBOOKS

- ^{1/} Stresses above the absolute maximum ratings may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.
- ^{2/} An undervoltage lockout circuit shuts the unit off when the input voltage drops to approximately 12 volts. Operation of the unit between 12 volts and 16 volts is nondestructive at reduced output power, but performance is not guaranteed.

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DEPARTMENT OF DEFENSE

- MIL-HDBK-103 - List of Standard Microcircuit Drawings.
- MIL-HDBK-780 - Standard Microcircuit Drawings.

(Unless otherwise indicated, copies of the specification, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Item requirements. The individual item performance requirements for device classes D, E, G, H, and K shall be in accordance with MIL-PRF-38534. Compliance with MIL-PRF-38534 may include the performance of all tests herein or as designated in the device manufacturer's Quality Management (QM) plan or as designated for the applicable device class. Therefore, the tests and inspections herein may not be performed for the applicable device class (see MIL-PRF-38534). Furthermore, the manufacturer may take exceptions or use alternate methods to the tests and inspections herein and not perform them. However, the performance requirements as defined in MIL-PRF-38534 shall be met for the applicable device class.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38534 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein and figure 1.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 2.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall apply over the full specified operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are defined in table I.

3.5 Marking of device(s). Marking of device(s) shall be in accordance with MIL-PRF-38534. The device shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's vendor similar PIN may also be marked in MIL-HDBK-103 and QML-38534.

3.6 Data. In addition to the general performance requirements of MIL-PRF-38534, the manufacturer of the device described herein shall maintain the electrical test data (variables format) from the initial quality conformance inspection group A lot sample, for each device type listed herein. Also, the data should include a summary of all parameters manually tested, and for those which, if any, are guaranteed. This data shall be maintained under document revision level control by the manufacturer and be made available to the preparing activity (DSCC-VA) upon request.

3.7 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to supply to this drawing. The certificate of compliance (original copy) submitted to DSCC-VA shall affirm that the manufacturer's product meets the performance requirements of MIL-PRF-38534 and herein.

3.8 Certificate of conformance. A certificate of conformance as required in MIL-PRF-38534 shall be provided with each lot of microcircuits delivered to this drawing.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-PRF-38534 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ -55°C ≤ T _C ≤ +125°C V _{IN} = 28 V dc ±0.5 V no external sync unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
Output voltage	V _{OUT}	I _{OUT} = 10 A dc	1	01,02	4.95	5.05	V
			2,3		4.875	5.125	
			R	1,2,3	02	4.70	
Output current	I _{OUT}	V _{IN} = 16 V dc to 40V dc	1,2,3	01,02	0.0	10	A
			R		1,2,3	02	
V _{OUT} ripple voltage	V _{RIP}	I _{OUT} = 10 A, B.W. = 10 kHz to 2 MHz	1	01,02		35	mVp-p
			2,3			50	
			R	1,2,3	02		
V _{OUT} line regulation	V _{RLINE}	I _{OUT} = 10 A, V _{IN} = 16V dc to 40V dc	1,2,3	01,02		20	mV
			R		1,2,3	02	
V _{OUT} load regulation	V _{RLOAD}	I _{OUT} = 0 to 5 A	1,2,3	01,02		20	mV
			R		1,2,3	02	
Input current	I _{IN}	I _{OUT} = 0 A, Inhibit (pin 4 and pin 12) = open	1,2,3	01,02		120	mA
			R		1,2,3	02	
		I _{OUT} = 0 A, Inhibit 1 (pin4) tied to input return (pin 2)	1,2,3	01,02		14	
			R		1,2,3	02	
		I _{OUT} = 0 A, Inhibit 2 (pin 12) tied to output return (pin 8)	1,2,3	01,02		70	
			R		1,2,3	02	
Short circuit current	I _{SC}	V _{OUT} < 1.0 V dc	1,2,3	01,02	8.8	12	A
			R		1,2,3	02	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C V _{IN} = 28 V dc ±0.5 V no external sync unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
I _{IN} ripple current	I _{RIP}	I _{OUT} = 10 A, B.W. = 10 kHz to 10 MHz	1	01,02		45	mAp-p
			2,3			50	
			R	1,2,3	02		
Efficiency	Eff	I _{OUT} = 10 A	1	01	77		%
				02	75		
			2,3	01	75		
				02	73		
			R	1,2,3	02	72	
Isolation	ISO	Input to output or any pin to case at 500 V dc, T _C = +25°C	1	01,02	100		MΩ
			R	1	02	100	
Capacitive load <u>2/ 3/</u>	C _L	No effect on dc performance, T _C = +25°C	4	01,02		1000	μF
			R	4	02		
Power dissipation load fault	P _D	Short circuit	1	01,02		16	W
					2,3		
			R	1,2,3	02		
Switching frquency	F _S	I _{OUT} = 10 A	4	01,02	550	650	kHz
					5,6	525	
			R	4,5,6	02	500	
External sync range <u>4/</u>	F _{SYNC}	I _{OUT} = 10 A, TTL level to pin <u>6</u>	4,5,6	01,02	525	675	kHz
			R	4,5,6	02	525	

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C V _{IN} = 28 V dc ±0.5 V no external sync unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
V _{OUT} step load transient <u>5/</u>	V _{TLOAD}	I _{OUT} = 5 A to 10 A	4,5,6	01	-350	+350	mV pk
				02	-500	+500	
		I _{OUT} = 10 A to 5 A		01	-350	+350	
				02	-500	+500	
		I _{OUT} = 5 A to 10 A	R	4,5,6	02	-1200	
I _{OUT} = 10 A to 5 A							
V _{OUT} step load transient recovery <u>3/ 5/ 6/</u>	T _{TLOAD}	I _{OUT} = 5 A to 10 A	4,5,6	01,02		3.0	ms
			R	4,5,6	02		
		I _{OUT} = 10 A to 5 A	4,5,6	01,02		3.0	
			R	4,5,6	02		
V _{OUT} step line transient <u>3/ 7/</u>	V _{TLINE}	I _{OUT} = 10 A, Input step 16 V dc to 40 V dc	4,5,6	01,02		300	mV pk
			R	4,5,6	02		
		I _{OUT} = 10 A, Input step 40 V dc to 16 V dc	4,5,6	01,02		300	
			R	4,5,6	02		
V _{OUT} step line transient recovery <u>3/ 6/ 7/</u>	T _{TLINE}	I _{OUT} = 10 A, Input step 16 V dc to 40 V dc	4,5,6	01,02		300	μs
			R	4,5,6	02		
		I _{OUT} = 10 A, Input step 40 V dc to 16 V dc	4,5,6	01,02		300	
			R	4,5,6	02		
Start up overshoot <u>3/</u>	V _{tonos}	I _{OUT} = 10 A, V _{IN} = 0 to 40 V dc	4,5,6	01,02		25	mV pk
			R	4,5,6	02		

See footnotes at end of table.

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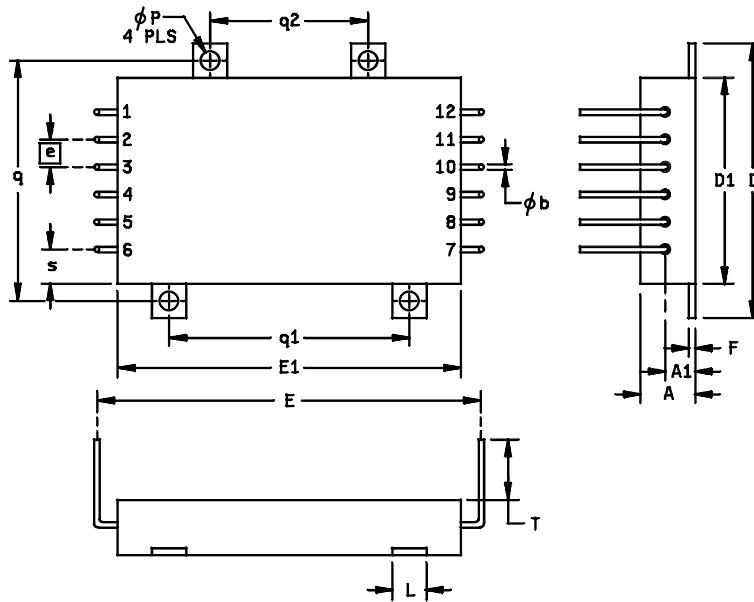
TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions <u>1/</u> -55°C ≤ T _C ≤ +125°C V _{IN} = 28 V dc ±0.5 V no external sync unless otherwise specified	Group A subgroups	Device types	Limits		Unit
					Min	Max	
Start up delay <u>8/</u>	T _{ONB}	I _{OUT} = 10 A, V _{IN} = 0 to 28 V dc	4,5,6	01,02		6	ms
			R	4,5,6	02	12	
Load fault recovery <u>3/</u>	T _{RLF}	I _{OUT} = 10 A	4,5,6	01,02		4	ms
			R	4,5,6	02	8	

- 1/ Post irradiation testing shall be in accordance with 4.3.5 herein.
- 2/ Capacitive load may be any value from 0 to the maximum limit without compromising dc performance.
- 3/ Parameter shall be tested as part of design characterization and after design or process changes; therefore, the parameter shall be guaranteed to limits specified in table I.
- 4/ A TTL level waveform (V_{IH} = 4.5 V minimum, V_{IL} = 0.8 V maximum) with a 50 percent ±10 percent duty cycle applied to the sync input pin (pin 6) within the the sync range frequency shall cause the converter's switching frequency to become synchronous with the frequency applied to the sync input pin (pin 6).
- 5/ Load step transition time is between 2 and 10 microseconds.
- 6/ Recovery time is measured from the initiation of the transient until V_{OUT} has returned to within ±1 percent of its final value.
- 7/ Input step transition time greater than 10 microseconds.
- 8/ Turn-on delay time measurement is either for a step application of power at the input or the removal of a ground signal from the inhibit 1 pin (pin 4) or inhibit 2 pin (pin 12) while power is applied to the input

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Case outline T.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		10.16		.400
A1	5.33	5.84	.210	.230
ϕb	0.89	1.14	.035	.045
D	50.55	51.05	1.990	2.010
D1	37.85	38.35	1.490	1.510
e	5.08 BSC		.200 BSC	
E	69.85	72.39	2.750	2.850
E1	63.25	63.75	2.490	2.510
F	1.14	1.40	.045	.055
L	6.10	6.60	.240	.260
ϕP	3.43	3.68	.135	.145
q/q1	44.20	44.70	1.740	1.760
q2	28.96	29.46	1.140	1.160
s	6.10	6.60	.240	.260
T	10.92	11.43	.430	.450

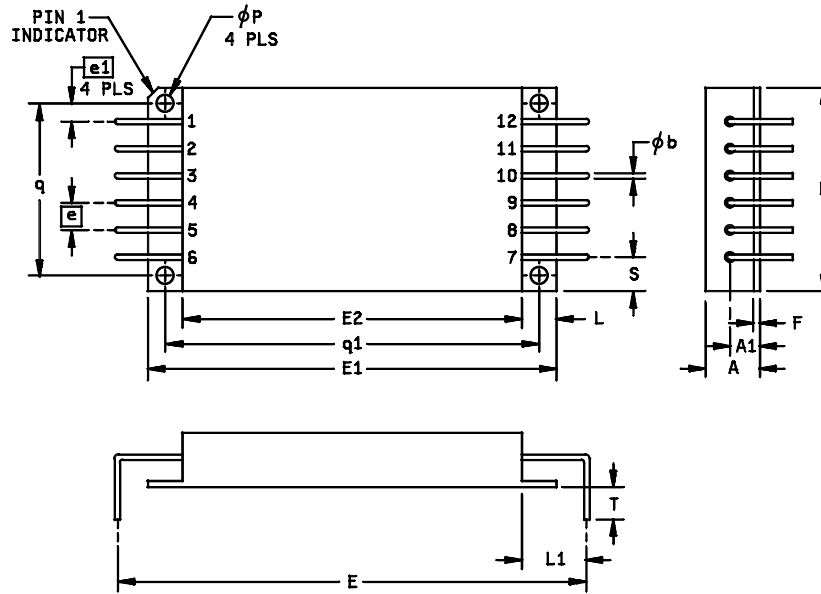
NOTES:

1. The U.S. government preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Device weight: 86 grams maximum.

FIGURE 1. Case outline(s).

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Case outline U.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		10.16		.400
A1	5.46	5.72	.215	.225
ϕb	0.89	1.14	.035	.045
D	37.97	38.23	1.495	1.505
e	5.08 BSC		.200 BSC	
e1	3.30 BSC		.130 BSC	
E	87.38	87.88	3.440	3.460
E1	75.95	76.45	2.990	3.010
E2	63.37	63.63	2.495	2.505
F	1.14	1.40	.045	.055
L	6.10	6.60	.240	.260
L1	11.94	12.19	.470	.480
ϕP	3.12	3.38	.123	.133
q	31.88	32.13	1.255	1.265
q1	69.85	70.36	2.750	2.770
S	6.22	6.48	.245	.255
T	5.84	6.86	.230	.270

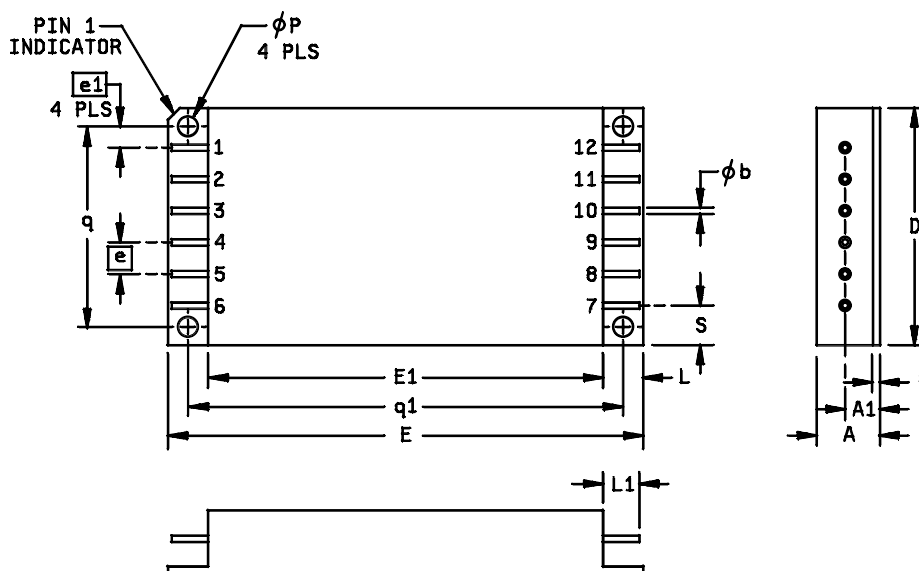
NOTES:

1. The U.S. government preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Device weight: 86 grams maximum.

FIGURE 1. Case outline(s) - Continued.

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Case outline X.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		10.16		.400
A1	5.46	5.72	.215	.225
ϕb	0.89	1.14	.035	.045
D	37.97	38.23	1.495	1.505
e	5.08 BSC		.200 BSC	
e1	3.30 BSC		.130 BSC	
E	75.95	76.45	2.990	3.010
E1	63.37	63.63	2.495	2.505
F	1.14	1.40	.045	.055
L	6.10	6.60	.240	.260
L1	5.58	6.10	.220	.240
ϕP	3.12	3.38	.123	.133
q	31.88	32.13	1.255	1.265
q1	69.85	70.36	2.750	2.770
S	6.22	6.48	.245	.255

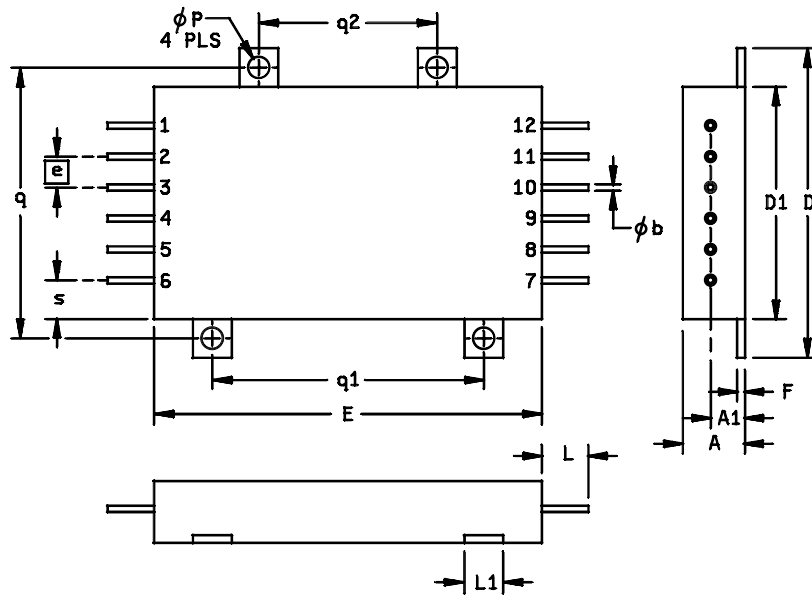
NOTES:

1. The U.S. government preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Device weight: 86 grams maximum.

FIGURE 1. Case outline(s) - Continued.

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Case outline Y.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		10.16		.400
A1	5.33	5.84	.210	.230
ϕb	0.89	1.14	.035	.045
D	50.55	51.05	1.990	2.010
D1	37.85	38.35	1.490	1.510
e	5.08 BSC		.200 BSC	
E	63.25	63.75	2.490	2.510
F	1.14	1.40	.045	.055
L	6.99	8.26	.275	.325
L1	6.10	6.60	.240	.260
ϕP	3.43	3.68	.135	.145
q/q1	44.20	44.70	1.740	1.760
q2	28.96	29.46	1.140	1.160
s	6.10	6.60	.240	.260

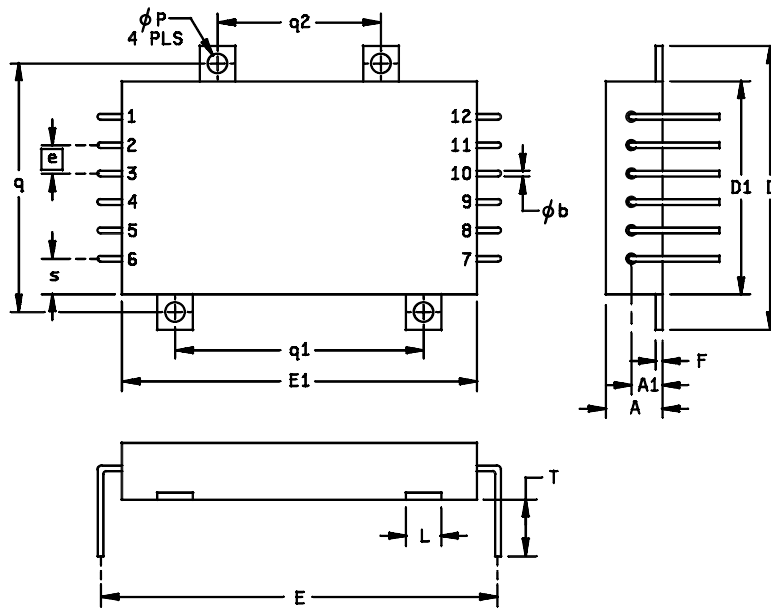
NOTES:

1. The U.S. government preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Device weight: 86 grams maximum.

FIGURE 1. Case outline(s) - Continued.

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Case outline Z.



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A		10.16		.400
A1	5.33	5.84	.210	.230
ϕb	0.89	1.14	.035	.045
D	50.55	51.05	1.990	2.010
D1	37.85	38.35	1.490	1.510
e	5.08 BSC		.200 BSC	
E	69.85	72.39	2.750	2.850
E1	63.25	63.75	2.490	2.510
F	1.14	1.40	.045	.055
L	6.10	6.60	.240	.260
ϕP	3.43	3.68	.135	.145
q/q1	44.20	44.70	1.740	1.760
q2	28.96	29.46	1.140	1.160
s	6.10	6.60	.240	.260
T	8.64	9.65	.340	.380

NOTES:

1. The U.S. government preferred system of measurement is the metric SI. This item was designed using inch-pound units of measurement. In case of problems involving conflicts between the metric and inch-pound units, the inch-pound units shall rule.
2. Device weight: 86 grams maximum.

FIGURE 1. Case outline(s) - Continued.

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Device types	01 and 02
Case outlines	T, U, X, Y, and Z
Terminal number	Terminal symbol
1	Input
2	Input common
3	Tri
4	Inhibit 1
5	Sync output
6	Sync input
7	Positive output
8	Output common
9	Remote sense return
10	Positive remote sense
11	Slave to master
12	Master to slave/ Inhibit 2

NOTES:

- Multiple devices may be used in parallel to drive a common load. When using this mode of operation the load current is shared by two or three devices. In the current sharing mode, one device is designated as the master. The slave to master pin (pin 11) of the master device is not connected and the master to slave/inhibit 2 pin (pin 12) of the master is connected to the slave to master pin (pin 11) of the slave device(s). The device(s) designated as slave(s) have the master to slave/inhibit 2 pin (pin 11) connected to the remote sense return pin (pin 9).
- A second slave device may be placed in parallel with a master and slave device, this requires the Tri pin (pin 3) of the master device to be connected to the remote sense pin (pin 9). When paralleled, 95 percent of the sum of the power of the devices is available at the load. This means that 143 watts at 5 volts is available for three devices in parallel. When using remote sense in parallel operation, only the master device should have its remote sense pins (pins 9 and 10) connected to the load, and the slave devices should have the remote sense pins (pins 9 and 10) connected to the output power pins (pins 7 and 8).
- The device has a sync input pin (pin 6) and a sync output pin (pin 5) which allows multiple devices, whether they're in a single unit or master/slave configurations to be synchronized to a system clock or each other. Two or more devices may be synchronized to each other by connecting the sync output pin (pin 5) of one to the sync input pin (pin 6) of another.
- The device has two inhibit options, one is ground referenced to the input common and the other is referenced to the output common. The output referred inhibit pin uses the master to slave/inhibit 2 pin (pin 12). This pin is normally used to parallel devices, and a TTL compatible open collector low will inhibit the device when applied to this pin.

FIGURE 2. Terminal connections.

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TABLE II. Electrical test requirements.

MIL-PRF-38534 test requirements	Subgroups (in accordance with MIL-PRF-38534, group A test table)
Interim electrical parameters	---
Final electrical parameters	1*, 2, 3, 4, 5, 6
Group A test requirements	1, 2, 3, 4, 5, 6
Group C end-point electrical parameters	1
End-point electrical parameters for radiation hardness assurance (RHA) devices	1, 2, 3, 4, 5, 6

* PDA applies to subgroup 1.

4.2 Screening. Screening shall be in accordance with MIL-PRF-38534. The following additional criteria shall apply:

- a. Burn-in test, method 1015 of MIL-STD-883.
 - (1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DSCC-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.
 - (2) T_A as specified in accordance with table I of method 1015 of MIL-STD-883.
- b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Conformance and periodic inspections. Conformance inspection (CI) and periodic inspection (PI) shall be in accordance with MIL-PRF-38534 and as specified herein.

4.3.1 Group A inspection (CI). Group A inspection shall be in accordance with MIL-PRF-38534 and as follows:

- a. Tests shall be as specified in table II herein.
- b. Subgroups 7, 8, 9, 10, and 11 shall be omitted.

4.3.2 Group B inspection (PI). Group B inspection shall be in accordance with MIL-PRF-38534.

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4.3.3 Group C inspection (PI). Group C inspection shall be in accordance with MIL-PRF-38534 and as follows:

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test, method 1005 of MIL-STD-883.
 - (1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to either DSCC-VA or the acquiring activity upon request. Also, the test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
 - (2) T_A as specified in accordance with table I of method 1005 of MIL-STD-883.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.3.4 Group D inspection (PI). Group D inspection shall be in accordance with MIL-PRF-38534.

4.3.5. Radiation hardness assurance (RHA). RHA qualification is required only for those devices with the RHA designator as specified herein.

	RHA level R	Units
Total ionizing dose tolerance level	100	kRad (Si)
Single event upset survival level (LET)	40	MeV

- a. Radiation dose rate is in accordance with condition C of method 1019 of MIL-STD-883. Unless otherwise specified, components are tested at a rate of 9 rad(Si)/s, in accordance with method 1019 of MIL-STD-750 or MIL-STD-883, as applicable.
- b. The manufacturer shall perform a worst-case and radiation susceptibility analysis on the device. This analysis shall show that the minimum performance requirements of each component has adequate design margin under worst-case operating conditions (extremes of line voltage, temperatures, load, frequency, radiation environment, etc.). This analysis guarantees the post-irradiation parameter limits specified in table I.
- c. RHA testing shall be performed at the component level for initial device qualification, and after design changes that may affect the RHA performance of the device. As an alternative to testing, components may be procured to manufacturer radiation guarantees that meet the minimum performance requirements. Component radiation performance guarantees shall be established in compliance with MIL-PRF-19500, Group D or MIL-PRF-38535, Group E, as applicable. For components with less than adequate performance margin, component lot radiation acceptance screening shall be performed.
- d. The manufacturer shall establish procedures controlling component radiation testing, and shall establish radiation test plans used to implement component lot qualification during procurement. Test plans and test reports shall be filed and controlled in accordance with the manufacturer's configuration management system.
- e. The device manufacturer shall designate a RHA program manager to oversee component lot qualification, and to monitor design changes for continued compliance to RHA requirements.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38534.

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6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-PRF-38534.

6.4 Record of users. Military and industrial users shall inform Defense Supply Center Columbus when a system application requires configuration control and the applicable SMD. DSCC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronic devices (FSC 5962) should contact DSCC-VA, telephone (614) 692-0544.

6.5 Comments. Comments on this drawing should be directed to DSCC-VA, Post Office Box 3990, Columbus, Ohio 43216-5000, or telephone (614) 692-1081.

6.6 Sources of supply. Sources of supply are listed in MIL-HDBK-103 and QML-38534. The vendors listed in MIL-HDBK-103 and QML-38534 have submitted a certificate of compliance (see 3.7 herein) to DSCC-VA and have agreed to this drawing.

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STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 02-06-21

Approved sources of supply for SMD 5962-93163 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38534 during the next revisions. MIL-HDBK-103 and QML-38534 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DSCC-VA. This bulletin is superseded by the next dated revisions of MIL-HDBK-103 and QML-38534.

Standard microcircuit drawing PIN <u>1/</u>	Vendor CAGE number	Vendor similar PIN <u>2/</u>
5962-9316301HTA 5962-9316301HTC 5962-9316302HTA 5962-9316302HTC 5962R9316302HTA 5962R9316302HTC 5962R9316302KTA 5962R9316302KTC	50821 50821 50821 50821 50821 50821 50821 50821	MFL2805SW/883 MFL2805SW/883 SMFL2805SW/HO SMFL2805SW/HO SMFL2805SW/HR SMFL2805SW/HR SMFL2805SW/KR SMFL2805SW/KR
5962-9316301HUA 5962-9316301HUC 5962-9316302HUA 5962-9316302HUC 5962R9316302HUA 5962R9316302HUC 5962R9316302KUA 5962R9316302KUC	50821 50821 50821 50821 50821 50821 50821 50821	MFL2805SV/883 MFL2805SV/883 SMFL2805SV/HO SMFL2805SV/HO SMFL2805SV/HR SMFL2805SV/HR SMFL2805SV/KR SMFL2805SV/KR
5962-9316301HXA 5962-9316301HXC 5962-9316302HXA 5962-9316302HXC 5962R9316302HXA 5962R9316302HXC 5962R9316302KXA 5962R9316302KXC	50821 50821 50821 50821 50821 50821 50821 50821	MFL2805S/883 MFL2805S/883 SMFL2805S/HO SMFL2805S/HO SMFL2805S/HR SMFL2805S/HR SMFL2805S/KR SMFL2805S/KR
5962-9316301HYA 5962-9316301HYC 5962-9316302HYA 5962-9316302HYC 5962R9316302HYA 5962R9316302HYC 5962R9316302KYA 5962R9316302KYC	50821 50821 50821 50821 50821 50821 50821 50821	MFL2805SY/883 MFL2805SY/883 SMFL2805SY/HO SMFL2805SY/HO SMFL2805SY/HR SMFL2805SY/HR SMFL2805SY/KR SMFL2805SY/KR
5962-9316301HZA 5962-9316301HZC 5962-9316302HZA 5962-9316302HZC 5962R9316302HZA 5962R9316302HZC 5962R9316302KZA 5962R9316302KZC	50821 50821 50821 50821 50821 50821 50821 50821	MFL2805SZ/883 MFL2805SZ/883 SMFL2805SZ/HO SMFL2805SZ/HO SMFL2805SZ/HR SMFL2805SZ/HR SMFL2805SZ/KR SMFL2805SZ/KR

- 1/ The lead finish shown for each PIN representing a hermetic package is the most readily available from the manufacturer listed for that part. If the desired lead finish is not listed contact the Vendor to determine its availability.
- 2/ **Caution.** Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

STANDARD MICROCIRCUIT DRAWING BULLETIN - CONTINUED.

DATE: 02-06-21

Vendor CAGE
number

50821

Vendor name
and address

Interpoint Corporation
10301 Willows Road
Redmond, WA 98073-9705

The information contained herein is disseminated for convenience only and the Government assumes no liability whatsoever for any inaccuracies in the information bulletin.