REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED
A	Add device types 05, 06, 07, and 08. Make changes to 1.2.2, 1.3, 1.4, 1.5, Table I, Figure 1 and Figure 2. - ro	06-06-12	R. MONNIN

REV																				
SHEET																				
REV	A	A	A	A	A															
SHEET	15	16	17	18	19															

REV STATUS	REV	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
OF SHEETS	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	

PMIC N/A

PREPARED BY
RICK OFFICER

DEFENSE SUPPLY CENTER COLUMBUS
COLUMBUS, OHIO 43218-3990
http://www.dscc.dla.mil

STANDARD MICROCIRCUIT DRAWING

THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE

AMSC N/A

CHECKED BY
RAJESH PITHADIA

APPROVED BY
RAYMOND MONNIN

DRAWING APPROVAL DATE
06-05-08

MICROCIRCUIT, DIGITAL-LINEAR, 3 V, RS-232, RECEIVER / TRANSMITTER TRANCEIVER, MONOLITHIC SILICON

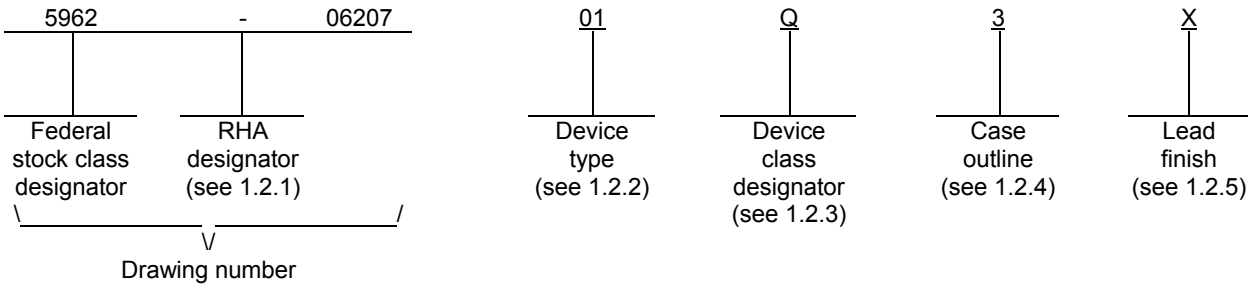
REVISION LEVEL	SIZE	CAGE CODE	
A	A	**67268**	**5962-06207**

SHEET 1 OF 19

1. SCOPE

1.1 Scope. This drawing documents two product assurance class levels consisting of high reliability (device classes Q and M) and space application (device class V). A choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). When available, a choice of Radiation Hardness Assurance (RHA) levels is reflected in the PIN.

1.2 PIN. The PIN is as shown in the following example:



1.2.1 RHA designator. Device classes Q and V RHA marked devices meet the MIL-PRF-38535 specified RHA levels and are marked with the appropriate RHA designator. Device class M RHA marked devices meet the MIL-PRF-38535, appendix A specified RHA levels and are 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:

Device type	Generic number	Circuit function
01	ICL3243E	3 V V_{CC} RS-232, 5 receivers / 3 transmitters transceiver with shutdown
02	ICL3238E	3 V V_{CC} RS-232, 3 receivers / 5 transmitters transceiver with shutdown
03	ICL3232E	3 V V_{CC} RS-232, 2 receivers / 2 transmitters transceiver
04	ICL3221E	3 V V_{CC} RS-232, 1 receiver / 1 transmitter transceiver with shutdown
05	ICL3243E	5 V V_{CC} RS-232, 5 receivers / 3 transmitters transceiver with shutdown
06	ICL3238E	5 V V_{CC} RS-232, 3 receivers / 5 transmitters transceiver with shutdown
07	ICL3232E	5 V V_{CC} RS-232, 2 receivers / 2 transmitters transceiver
08	ICL3221E	5 V V_{CC} RS-232, 1 receiver / 1 transmitter transceiver with shutdown

1.2.3 Device class designator. The device class designator is a single letter identifying the product assurance level as follows:

Device class	Device requirements documentation
M	Vendor self-certification to the requirements for MIL-STD-883 compliant, non-JAN class level B microcircuits in accordance with MIL-PRF-38535, appendix A
Q or V	Certification and qualification to MIL-PRF-38535

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

Outline letter	Descriptive designator	Terminals	Package style
2	CQCC1-N20	20	Square leadless chip carrier
3	CQCC1-N28	28	Square leadless chip carrier

1.2.5 Lead finish. The lead finish is as specified in MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

1.3 Absolute maximum ratings. 1/

V_{CC} to ground ..... -0.3 V to 6 V
V+ to ground ..... -0.3 V to 7 V
V- to ground ..... +0.3 V to -7 V
V+ to V- ..... 14 V
Input voltages:
T_{IN}, $\overline{FORCEOFF}$, FORCEON, $\overline{EN}$ ..... -0.3 V to 6 V 2/
R_{IN} ..... ±25 V
Output voltages:
T_{OUT} ..... ±13.2 V
R_{OUT}, $\overline{INVALID}$ ..... -0.3 V to V_{CC} +0.3 V
Short circuit duration:
T_{OUT} ..... Continuous
Storage temperature range ..... -65°C to +150°C
Lead temperature (soldering, 10 seconds) ..... +300°C
Junction temperature (T_J) :
Device types 01, 02, 03, 04, 05, 06, 07, 08 ..... +175°C
Thermal resistance, junction-to-case (θ_{JC}):
Cases 2 and 3 ..... See MIL-STD-1835
Thermal resistance, junction-to-ambient (θ_{JA}):
Case 2 ..... 90°C/W
Case 3 ..... 70°C/W

1.4 Recommended operating conditions.

Operating voltage range:
Device types 01, 02, 03, and 04 ..... +3.0 V dc to +3.6 V dc
Device types 05, 06, 07, and 08 ..... +4.5 V dc to +5.5 V dc
Ambient operating temperature range (T_A) ..... -55°C to +125°C

1/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.

2/ $\overline{EN}$ only applies to device types 04 and 08.

1.5 ESD performance. T_A = 25°C

RS232 pins (T_{OUT}, R_{IN}):
Human body model :
Device types 01, 02, 03, 04, 05, 06, 07, 08 ..... ±15 kV
IEC61000-4-2 contact discharge :
Device types 01, 02, 03, 04, 05, 06, 07, 08 ..... ±8 kV
IEC61000-4-2 air gap discharge :
Device types 01, 02, 03, 04, 05, 06, 07, 08 ..... ±15 kV
All other pins:
Human body model :
Device types 01, 03, 04, 05, 07, 08 ..... ±2 kV
Device types 02, 06 ..... ±2.5 kV

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 cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATION

MIL-PRF-38535 - Integrated Circuits, Manufacturing, General Specification for.

DEPARTMENT OF DEFENSE STANDARDS

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

DEPARTMENT OF DEFENSE HANDBOOKS

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

(Copies of these documents are available online at http://assist.daps.dla.mil/quicksearch/ or http://assist.daps.dla.mil or 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 requirements for device classes Q and V shall be in accordance with MIL-PRF-38535 and as specified herein 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. The individual item requirements for device class M shall be in accordance with MIL-PRF-38535, appendix A for non-JAN class level B devices and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein for device classes Q and V or MIL-PRF-38535, appendix A and herein for device class M.

3.2.1 Case outlines. The case outlines shall be in accordance with 1.2.4 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.3 Truth tables. The truth tables shall be as specified on figure 2.

3.3 Electrical performance characteristics and postirradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and postirradiation parameter limits are as specified in table I and shall apply over the full ambient 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. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked. For packages where marking of the entire SMD PIN number is not feasible due to space limitations, the manufacturer has the option of not marking the "5962-" on the device. For RHA product using this option, the RHA designator shall still be marked. Marking for device classes Q and V shall be in accordance with MIL-PRF-38535. Marking for device class M shall be in accordance with MIL-PRF-38535, appendix A.

3.5.1 Certification/compliance mark. The certification mark for device classes Q and V shall be a "QML" or "Q" as required in MIL-PRF-38535. The compliance mark for device class M shall be a "C" as required in MIL-PRF-38535, appendix A.

3.6 Certificate of compliance. For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.6.1 herein). For device class M, a certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-HDBK-103 (see 6.6.2 herein). The certificate of compliance submitted to DSCC-VA prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device classes Q and V, the requirements of MIL-PRF-38535 and herein or for device class M, the requirements of MIL-PRF-38535, appendix A and herein.

3.7 Certificate of conformance. A certificate of conformance as required for device classes Q and V in MIL-PRF-38535 or for device class M in MIL-PRF-38535, appendix A shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DSCC-VA of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change that affects this drawing.

3.9 Verification and review for device class M. For device class M, DSCC, DSCC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

3.10 Microcircuit group assignment for device class M. Device class M devices covered by this drawing shall be in microcircuit group number 77 (see MIL-PRF-38535, appendix A).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
DC characteristics							
Supply current, automatic powerdown	I_{CCAPD}	All R_{IN} open, FORCEON = GND,	1,2,3	03, 07		10	µA
		All R_{IN} open, FORCEON = GND, $\overline{FORCEOFF}$ = V_{CC}		01, 02, 04, 05, 06, 08		10	
Supply current, powerdown	I_{CCPD}		1,2,3	03, 07		10	µA
		$\overline{FORCEOFF}$ = GND		01, 02, 04, 05, 06, 08		10	
Supply current, powered up	I_{CCPU}	V_{CC} = 3.0 V, all outputs unloaded, FORCE ON = $\overline{FORCEOFF}$ = V_{CC}	1,2,3	01		1.8	mA
		V_{CC} = 3.15 V, all outputs unloaded, FORCE ON = $\overline{FORCEOFF}$ = V_{CC}		03,04		1.8	
		All outputs unloaded, FORCE ON = $\overline{FORCEOFF}$ = V_{CC}		02, 05, 06, 07, 08		1.8	
Logic and transmitter inputs and receiver outputs							
Input logic threshold low	V_{INL}	T_{IN}, FORCEON, $\overline{EN}$, 2/ $\overline{FORCEOFF}$	1,2,3	01, 03, 04, 05, 07, 08		0.8	V
		T_{IN}, FORCEON, $\overline{FORCEOFF}$ wake up threshold		02, 06		0.8	
Input logic threshold high	V_{INH}	T_{IN}, FORCEON, $\overline{EN}$, 2/ $\overline{FORCEOFF}$	1,2,3	01, 03, 04	2.0		V
				05, 07, 08	2.2		
		T_{IN}, FORCEON, $\overline{FORCEOFF}$ wake up threshold		02	2.0		
				06	2.4		

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Logic and transmitter inputs and receiver outputs - continued							
Input leakage current	I_{IL}	T_{IN}, FORCEON, $\overline{EN}$, 2/ $\overline{FORCEOFF}$	1,2,3	01, 03, 04, 05, 07, 08		±10	µA
		T_{IN}, FORCEON, 3/ $\overline{FORCEOFF}$, V_{IN} = 0 V or V_{CC}		02, 06		±10	
Output leakage current	I_{OL}	$\overline{FORCEOFF}$ = GND or $\overline{EN}$ = V_{CC} 2/	1,2,3	01, 04, 05, 08		±10	µA
		$\overline{FORCEOFF}$ = GND		02, 06		±10	
Output voltage low	V_{OL}	I_{OUT} = 1.6 mA	1,2,3	01, 03, 04, 05, 07, 08		0.4	V
		I_{OUT} = 1.0 mA		02, 06		0.4	
Output voltage high	V_{OH}	I_{OUT} = -1.0 mA	1,2,3	01, 02, 03,04	V_{CC} – 0.6		V
				05, 06, 07, 08	V_{CC} – 0.9		
Automatic powerdown							
Receiver input thresholds to enable transmitters	V_{INRE}	Powers up, FORCEON = GND, FORCEOFF = V_{CC}	1,2,3	01, 04, 05, 08	-2.7	2.7	V
		Powers up		03, 07	-2.7	2.7	
Receiver input thresholds to disable transmitters	V_{INRD}	Powers down, FORCEON = GND, FORCEOFF = V_{CC}	1,2,3	01, 04, 05, 08	-0.3	0.3	V
		Powers down		03, 07	-0.3	0.3	
$\overline{INVALID}$ output voltage low	V_{OLAPD}	I_{OUT} = 1.6 mA, FORCEON = GND, FORCEOFF = V_{CC}	1,2,3	01, 04, 05, 08		0.4	V
		I_{OUT} = 1.6 mA		03, 07		0.4	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Automatic powerdown -		continued.					
$\overline{\text{INVALID}}$ output voltage high	V_{OHAPD}	I_{OUT} = -1.0 mA, FORCEON = GND, FORCEOFF = V_{CC}	1,2,3	01,04	V_{CC} – 0.6		V
				05, 08	V_{CC} – 0.9		
		I_{OUT} = -1.0 mA		03	V_{CC} – 0.6		
				07	V_{CC} – 0.9		
Enhanced automatic power down		(FORCEON = GND, $\overline{\text{FORCEOFF}}$ = V_{CC})					
Receiver input threshold to $\overline{\text{INVALID}}$ high	V_{INRH} $\overline{\text{INV}}$	Powered up	1,2,3	02, 06	-2.7	2.7	V
Receiver input threshold to $\overline{\text{INVALID}}$ low	V_{INRL} $\overline{\text{INV}}$	Powered down	1,2,3	02, 06	-0.3	0.3	V
$\overline{\text{INVALID}}$ output voltage low	V_{OL} $\overline{\text{INV}}$	I_{OUT} = 1.0 mA	1,2,3	02, 06		0.4	V
$\overline{\text{INVALID}}$ output voltage high	V_{OH} $\overline{\text{INV}}$	I_{OUT} = -1.0 mA	1,2,3	02	V_{CC} – 0.6		V
				06	V_{CC} – 0.9		
Receiver inputs							
Input voltage range	V_{INR}		1,2,3	All	-25	25	V
Input threshold low	V_{INRL}		1,2,3	01, 03, 04, 05, 07, 08	0.6		V
				02, 06	0.8		
Input threshold high	V_{INRH}		1,2,3	All		2.4	V
Input resistance	R_{IN}		4,5,6	All	3	7	kΩ

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Transmitter outputs							
Output voltage swing	V_{OUT}	All transmitter outputs loaded with 3 kΩ to ground	1,2,3	All	±5.0		V
Output resistance	R_{OUT}	V_{CC} = V+ = V- = 0 V, transmitter output = ±2 V	4,5,6	01, 03, 04, 05, 07, 08	300		Ω
Output short circuit current	I_{OS}		1,2,3	All		±60	mA
Output leakage current	I_{OL}	V_{OUT} = ±12 V, V_{CC} = 0 V or 3 V to 3.6 V automatic powerdown or $\overline{FORCEOFF}$ = GND	1,2,3	01, 02, 04		±25	µA
		V_{OUT} = ±12 V, V_{CC} = 0 V or 4.5 V to 5.5 V automatic powerdown or $\overline{FORCEOFF}$ = GND		05, 06, 08		±25	
		V_{OUT} = ±12 V, V_{CC} = 0 V, automatic powerdown or $\overline{FORCEOFF}$ = GND		03, 07		±25	
Mouse driveability							
Transmitter output voltage	V_{TO}	$T1_{IN}$ = $T2_{IN}$ = GND, $T3_{IN}$ = V_{CC}, $T3_{OUT}$ loaded with 3 kΩ to GND, $T1_{OUT}$ and $T2_{OUT}$ loaded with 2.5 mA each	1,2,3	01, 05	±5		V
Functional test		See 4.4.1b	7,8	All			

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Timing characteristics							
Maximum data rate	f_{MAX}	R_L = 3 kΩ, C_L = 1000 pF, one transmitter switching	9,10,11	All	250		kbps
Transmitter skew	t_{TR}	t_{PHL} - t_{PLH}	9,10,11	All		1000	ns
Receiver skew	t_{RS}	t_{PHL} - t_{PLH}	9,10,11	All		1000	ns
Transition region slew rate	t_{SLEW}	V_{CC} = 3.3 V, R_L = 3 kΩ to 7 kΩ, measured from 3 V to -3 V or -3 V to 3 V, C_L = 200 pF to 2500 pF	9,10,11	01,03, 04	4	30	V/µs
		V_{CC} = 3.3 V, R_L = 3 kΩ to 7 kΩ, measured from 3 V to -3 V or -3 V to 3 V, C_L = 200 pF to 1000 pF			6	30	
		V_{CC} = 3.3 V, R_L = 3 kΩ to 7 kΩ, measured from 3 V to -3 V or -3 V to 3 V, C_L = 150 pF to 1000 pF		02	6	30	
		V_{CC} = 3.3 V, R_L = 3 kΩ to 7 kΩ, measured from 3 V to -3 V or -3 V to 3 V, C_L = 150 pF to 2500 pF			4	30	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions $-55°C \le T_A \le +125°C$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Timing characteristics -		continued					
Transition region slew rate	t_{SLEW}	V_{CC} = 5.0 V, R_L = 3 kΩ to 7 kΩ, measured from 3 V to -3 V or -3 V to 3 V, C_L = 200 pF to 2500 pF	9,10,11	05, 07, 08	4	50	V/μs
		V_{CC} = 5.0 V, R_L = 3 kΩ to 7 kΩ, measured from 3 V to -3 V or -3 V to 3 V, C_L = 200 pF to 1000 pF			6	50	
		V_{CC} = 5.0 V, R_L = 3 kΩ to 7 kΩ, measured from 3 V to -3 V or -3 V to 3 V, C_L = 150 pF to 1000 pF		06	6	50	
		V_{CC} = 5.0 V, R_L = 3 kΩ to 7 kΩ, measured from 3 V to -3 V or -3 V to 3 V, C_L = 150 pF to 2500 pF			4	50	

1/ Unless otherwise specified, for device types 01, 02, 03, and 04, V_{CC} = 3 V to 3.6 V, C1 – C4 = 0.1 μF.
Unless otherwise specified, for device types 05, 06, 07, and 08, V_{CC} = 4.5 V to 5.5 V, C1 = 0.01 μF, C2 – C4 = 0.1 μF.

2/ $\overline{EN}$ only applies to device types 04 and 08.

3/ These inputs utilize a positive feedback resistor. The input current is negligible when the input is at either supply rail.

Device types	01, 05	02, 06
Case outline	3	3
Terminal number	Terminal symbol	
1	C2+	C2+
2	C2-	GND
3	V-	C2-
4	$R1_{IN}$	V-
5	$R2_{IN}$	$T1_{OUT}$
6	$R3_{IN}$	$T2_{OUT}$
7	$R4_{IN}$	$T3_{OUT}$
8	$R5_{IN}$	$R1_{IN}$
9	$T1_{OUT}$	$R2_{IN}$
10	$T2_{OUT}$	$T4_{OUT}$
11	$T3_{OUT}$	$R3_{IN}$
12	$T3_{IN}$	$T5_{OUT}$
13	$T2_{IN}$	FORCEON
14	$T1_{IN}$	$\overline{\text{FORCEOFF}}$
15	$R5_{OUT}$	$\overline{\text{INVALID}}$
16	$R4_{OUT}$	$R1_{OUTB}$
17	$R3_{OUT}$	$T5_{IN}$
18	$R2_{OUT}$	$R3_{OUT}$
19	$R1_{OUT}$	$T4_{IN}$
20	$R2_{OUTB}$	$R2_{OUT}$
21	$\overline{\text{INVALID}}$	$R1_{OUT}$
22	$\overline{\text{FORCEOFF}}$	$T3_{IN}$
23	FORCEON	$T2_{IN}$
24	C1-	$T1_{IN}$
25	GND	C1-
26	V_{CC}	V_{CC}
27	V+	V+
28	C1+	C1+

FIGURE 1. Terminal connections.

Device types	03, 07	04, 08
Case outline	2	2
Terminal number	Terminal symbol	
1	C1+	$\overline{EN}$
2	V+	C1+
3	NC	V+
4	C1-	C1-
5	C2+	C2+
6	C2-	C2-
7	V-	V-
8	NC	NC
9	$T2_{OUT}$	$R1_{IN}$
10	$R2_{IN}$	$R1_{OUT}$
11	$R2_{OUT}$	$\overline{INVALID}$
12	$T2_{IN}$	$T1_{IN}$
13	NC	NC
14	$T1_{IN}$	FORCEON
15	$R1_{OUT}$	NC
16	$R1_{IN}$	$T1_{OUT}$
17	$T1_{OUT}$	GND
18	NC	NC
19	GND	V_{CC}
20	V_{CC}	$\overline{FORCEOFF}$

FIGURE 1. Terminal connections – continued.

PIN	FUNCTION
V_{CC}	System power supply input. (3.0 V to 3.6 V for device types 01, 02, 03, and 04) (4.5 V to 5.5 V for device types 05, 06, 07, and 08)
V+	Internally generated positive transmitter supply.
V-	Internally generated negative transmitter supply.
GND	Ground connection.
C1+	External capacitor (voltage doubler) is connected to this lead.
C1-	External capacitor (voltage doubler) is connected to this lead.
C2+	External capacitor (voltage inverter) is connected to this lead.
C2-	External capacitor (voltage inverter) is connected to this lead.
T_{IN}	TTL/CMOS compatible transmitter inputs. (See note 1).
T_{OUT}	±15 kV ESD protected, RS-232 level (nominally ±5.5 V) transmitter outputs.
R_{IN}	±15 kV ESD protected, RS-232 compatible receiver inputs.
R_{OUT}	TTL/CMOS level receiver outputs.
R_{OUTB}	TTL/CMOS level, noninverting, always enabled receiver outputs.
$\overline{\text{INVALID}}$	Active low output that indicates if no valid RS-232 levels are present on any receiver input.
$\overline{\text{EN}}$	Active low receiver enable control. (Doesn't disable R_{OUTB} outputs for device types 01, 02, 05, and 06).
$\overline{\text{FORCEOFF}}$	Active low control to shut down transmitters and on-chip power supply. This overrides any automatic circuitry and FORCEON (see figure 2 and note 1).
FORCEON	Active high input to override automatic powerdown circuitry thereby keeping transmitters active. ($\overline{\text{FORCEOFF}}$ must be high).

NOTE:
1. The device types 02 and 06 input pins incorporate positive feedback resistors. Once the input is driven to a valid logic level, the feedback resistor maintains that logic level until V_{CC} is removed. Unused transmitter inputs may be left unconnected by the user.

FIGURE 1. Terminal connections – continued.

Powerdown logic truth table

Receiver or transmitter edge within 30 seconds	$\overline{\text{FORCEOFF}}$ INPUT	FORCEON input	TRANSMITTER outputs	RECEIVER outputs	R_{OUTB} output	RS-232 level present at receiver input?	$\overline{\text{INVALID}}$ output	Mode of operation
Device types 02 and 06								
No	H	H	Active	Active	Active	No	L	Normal operation (enhanced auto powerdown disabled)
No	H	H	Active	Active	Active	Yes	H	
Yes	H	L	Active	Active	Active	No	L	Normal operation (enhanced auto powerdown enabled)
Yes	H	L	Active	Active	Active	Yes	H	
No	H	L	High-Z	Active	Active	No	L	Powerdown due to enhanced auto powerdown logic
No	H	L	High-Z	Active	Active	Yes	H	
X	L	X	High-Z	High-Z	Active	No	L	Manual powerdown
X	L	X	High-Z	High-Z	Active	Yes	H	
$\overline{\text{INVALID}}$ driving FORCEON and $\overline{\text{FORCEOFF}}$ (emulates automatic powerdown)								
X	See note 1	See note 1	Active	Active	Active	Yes	H	Normal operation
X	See note 1	See note 1	High-Z	High-Z	Active	No	L	Forced auto powerdown

NOTE:

1. Input is connected to $\overline{\text{INVALID}}$ output.

FIGURE 2. Truth tables.

Powerdown and enable logic truth table

RS-232 Signal present at receiver input	$\overline{\text{FORCEOFF}}$ input	FORCEON input	$\overline{\text{EN}}$ input	TRANSMITTER outputs	RECEIVER outputs	R_{OUTB} outputs (see note 1)	$\overline{\text{INVALID}}$ output	Mode of operation
Device types 03, 04, 07, and 08 (see note 2)								
No	H	H	L	Active	Active	N.A.	L	Normal operation (auto powerdown disabled)
No	H	H	H	Active	High-Z	N.A.	L	
Yes	H	L	L	Active	Active	N.A.	H	Normal operation (auto powerdown enabled)
Yes	H	L	H	Active	High-Z	N.A.	H	
No	H	L	L	High-Z	Active	N.A.	L	Powerdown due to auto powerdown logic
No	H	L	H	High-Z	High-Z	N.A.	L	
Yes	L	X	L	High-Z	Active	N.A.	H	Manual powerdown
Yes	L	X	H	High-Z	High-Z	N.A.	H	Manual powerdown with receiver disabled
No	L	X	L	High-Z	Active	N.A.	L	Manual powerdown
No	L	X	H	High-Z	High-Z	N.A.	L	Manual powerdown with receiver disabled
Device types 01 and 05								
No	H	H	N.A.	Active	Active	Active	L	Normal operation (auto powerdown disabled)
Yes	H	L	N.A.	Active	Active	Active	H	Normal operation (auto powerdown enabled)
No	H	L	N.A.	High-Z	Active	Active	L	Powerdown due to auto powerdown logic
Yes	L	X	N.A.	High-Z	High-Z	Active	H	Manual powerdown
No	L	X	N.A.	High-Z	High-Z	Active	L	Manual powerdown

NOTE:
1. Applies only to device types 01 and 05.
2. $\overline{\text{EN}}$ only applies to device types 04 and 08.

FIGURE 2. Truth tables – Continued.

4. VERIFICATION

4.1 Sampling and inspection. For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-PRF-38535 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. For device class M, sampling and inspection procedures shall be in accordance with MIL-PRF-38535, appendix A.

4.2 Screening. For device classes Q and V, screening shall be in accordance with MIL-PRF-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection.

4.2.1 Additional criteria for device class M.

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 the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in method 1015.

(2) T_A = +125°C, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein.

4.2.2 Additional criteria for device classes Q and V.

a. The burn-in test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document revision level control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in method 1015 of MIL-STD-883.

b. Interim and final electrical test parameters shall be as specified in table II herein.

c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in MIL-PRF-38535, appendix B.

4.3 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-PRF-38535. Inspections to be performed shall be those specified in MIL-PRF-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4 Conformance inspection. Technology conformance inspection for classes Q and V shall be in accordance with MIL-PRF-38535 including groups A, B, C, D, and E inspections and as specified herein. Quality conformance inspection for device class M shall be in accordance with MIL-PRF-38535, appendix A and as specified herein. Inspections to be performed for device class M shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. For device class M, subgroups 7 and 8 tests shall be sufficient to verify the truth table. For device classes Q and V, subgroups 7 and 8 shall include verifying the functionality of the device.

TABLE II. Electrical test requirements.

Test requirements	Subgroups (in accordance with MIL-STD-883, method 5005, table I)	Subgroups (in accordance with MIL-PRF-38535, table III)	
	Device class M	Device class Q	Device class V
Interim electrical parameters (see 4.2)	1,7,9	1,7,9	1,7,9
Final electrical parameters (see 4.2)	1,2,3,4,5,6, 1/ 7,8,9,10,11	1,2,3,4,5,6, 1/ 7,8,9,10,11	1,2,3,4,5,6, 7,8,9,10,11 2/
Group A test requirements (see 4.4)	1,2,3,4,5,6, 7,8,9,10,11	1,2,3,4,5,6, 7,8,9,10,11	1,2,3,4,5,6, 7,8,9,10,11
Group C end-point electrical parameters (see 4.4)	1,2,3	1,2,3	1,2,3
Group D end-point electrical parameters (see 4.4)	1,7,9	1,7,9	1,7,9

1/ PDA applies to subgroup 1.
2/ PDA applies to subgroups 1 and 7.

4.4.2 Group C inspection. The group C inspection end-point electrical parameters shall be as specified in table II herein.

4.4.2.1 Additional criteria for device class M. Steady-state life test conditions, method 1005 of MIL-STD-883:

a. 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 the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in method 1005 of MIL-STD-883.

b. T_A = +125°C, minimum.

c. Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.4.2.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The test circuit shall be maintained under document revision level control by the device manufacturer's TRB in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in method 1005 of MIL-STD-883.

4.4.3 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table II herein.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-PRF-38535 for device classes Q and V or MIL-PRF-38535, appendix A for device class M.

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.

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

6.1.2 Substitutability. Device class Q devices will replace device class M devices.

6.2 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 using DD Form 1692, Engineering Change Proposal.

6.3 Record of users. Military and industrial users should inform Defense Supply Center Columbus (DSCC) when a system application requires configuration control and which SMD's are applicable to that system. 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.

6.4 Comments. Comments on this drawing should be directed to DSCC-VA, Columbus, Ohio 43218-3990, or telephone (614) 692-0547.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535 and MIL-HDBK-1331.

6.6 Sources of supply.

6.6.1 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DSCC-VA and have agreed to this drawing.

6.6.2 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-HDBK-103. The vendors listed in MIL-HDBK-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DSCC-VA.

STANDARD MICROCIRCUIT DRAWING BULLETIN

DATE: 06-06-12

Approved sources of supply for SMD 5962-06207 are listed below for immediate acquisition information only and shall be added to MIL-HDBK-103 and QML-38535 during the next revision. MIL-HDBK-103 and QML-38535 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 information bulletin is superseded by the next dated revision of MIL-HDBK-103 and QML-38535. DSCC maintains an online database of all current sources of supply at http://www.dscc.dla.mil/Programs/Smcr/.

Standard microcircuit drawing PIN 1/	Vendor CAGE number	Vendor similar PIN 2/
5962-0620701Q3A	34371	ICL3243E
5962-0620702Q3A	34371	ICL3238E
5962-0620703Q2A	34371	ICL3232E
5962-0620704Q2A	34371	ICL3221E
5962-0620705Q3A	34371	ICL3243E
5962-0620706Q3A	34371	ICL3238E
5962-0620707Q2A	34371	ICL3232E
5962-0620708Q2A	34371	ICL3221E

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.

Vendor CAGE number	Vendor name and address
34371	Intersil Corporation 1001 Murphy Ranch Road Milpitas, CA 95035-5680 Point of contact: 2401 Palm Bay Blvd. P.O. Box 883 Melbourne, FL 32902-0883