LM119QML

LM119QML High Speed Dual Comparator

Literature Number: SNOSAN3A

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LM119QML
High Speed Dual Comparator

General Description

The LM119 is a precision high speed dual comparator fabricated on a single monolithic chip. It is designed to operate over a wide range of supply voltages down to a single 5V logic supply and ground. Further, it has higher gain and lower input currents than devices like the LM710. The uncommitted collector of the output stage makes the LM119 compatible with RTL, DTL and TTL as well as capable of driving lamps and relays at currents up to 25 mA.

Although designed primarily for applications requiring operation from digital logic supplies, the LM119 is fully specified for power supplies up to ±15V. It features faster response than the LM111 at the expense of higher power dissipation. However, the high speed, wide operating voltage range and low package count make the LM119 much more versatile than older devices like the LM711.

Features

- Available with radiation guaranteed
  - — High Dose Rate 100 krad(Si)
  - — ELDRS Free 100 krad(Si)
- Two independent comparators
- Operates from a single 5V supply
- Typically 80 ns response time at ±15V
- Minimum fan-out of 2 each side
- Maximum input current of 1 µA over temperature
- Inputs and outputs can be isolated from system ground
- High common mode slew rate

Ordering Information

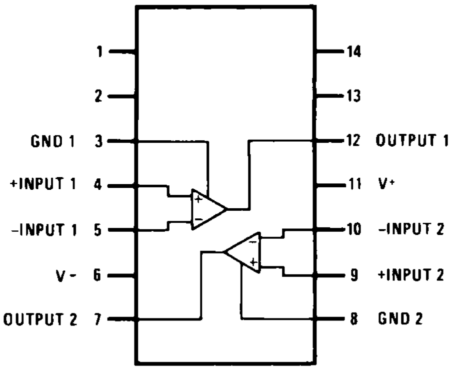
NS Part Number	SMD Part Number	NS Package Number	Package Description
LM119E/883		E20A	20LD LCC
LM119E-SMD	86014012A	E20A	20LD LCC
LM119H/883		H10C	10LD T0-100 Metal Can
LM119H-SMD	8601401IA	H10C	10LD T0-100 Metal Can
LM119H-QMLV	5962-9679801VIA	H10C	10LD T0-100 Metal Can
LM119HRQMLV **HIGH DOSE RATE** (Note 13)	5962R9679801VIA 100 krad(Si)	H10C	10LD T0-100 Metal Can
LM119HRLQMLV **ELDRS FREE** (Note 14)	5962R9679802VIA 100 krad(Si)	H10C	10LD T0-100 Metal Can
LM119J/883		J14A	14LD CERDIP
LM119J-SMD	8601401CA	J14A	14LD CERDIP
LM119J-QMLV	5962-9679801VCA	J14A	14LD CERDIP
LM119JRQMLV **HIGH DOSE RATE** (Note 13)	5962R9679801VCA 100 krad(Si)	J14A	14LD CERDIP
LM119JRLQMLV **ELDRS FREE** (Note 14)	5962R9679802VCA 100 krad(Si)	J14A	14LD CERDIP
LM119W/883		W10A	10LD CERPAK
LM119W-SMD	8601401HA	W10A	10LD CERPAK
LM119W-QMLV	5962-9679801VHA	W10A	10LD CERPAK
LM119WRQMLV **HIGH DOSE RATE** (Note 13)	5962R9679801VHA 100 krad(Si)	W10A	10LD CERPAK
LM119WRLQMLV **ELDRS FREE** (Note 14)	5962R9679802VHA 100 krad(Si)	W10A	10LD CERPAK
LM119WG/883		WG10A	10LD Ceramic SOIC
LM119WG-QMLV	5962-9679801VXA	WG10A	10LD Ceramic SOIC
LM119WGRQMLV **HIGH DOSE RATE** (Note 14)	5962R9679801VXA 100 krad(Si)	WG10A	10LD Ceramic SOIC

NS Part Number	SMD Part Number	NS Package Number	Package Description
LM119WGRLQMLV **ELDRS FREE** (Note 14)	5962R9679802VXA 100 krad(Si)	WG10A	10LD Ceramic SOIC
LM119 MDE **ELDRS FREE DIE** (Notes 1, 14)	5962R9679802V9A 100 krad(Si)		
LM119 MDR **HIGH DOSE RATE DIE** (Notes 1, 13)	5962R9679801V9A 100 krad(Si)		

Note 1: FOR ADDITIONAL DIE INFORMATION, PLEASE VISIT THE HI REL WEB SITE AT: www.national.com/analog/space/level_die

Connection Diagrams

Dual-In-Line Package



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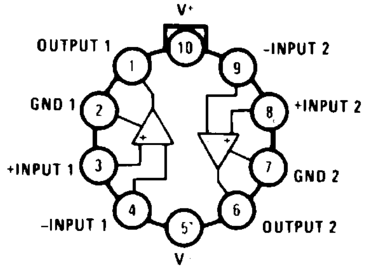
Top View
See NS Package Number J14A

Metal Can Package



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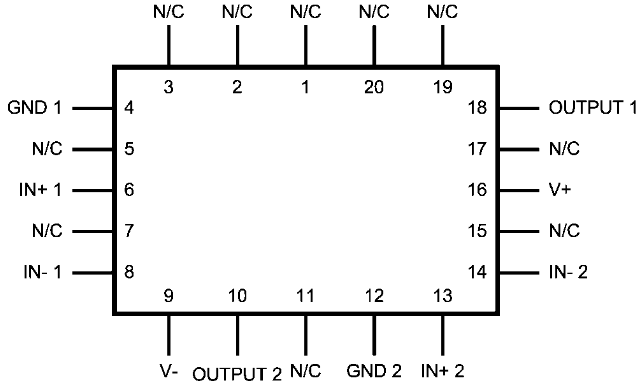
Case is connected to pin 5 (V−)

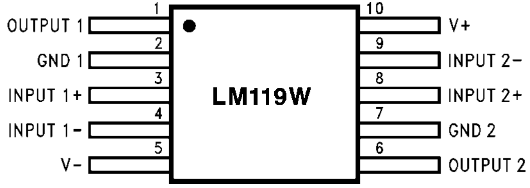
Top View
See NS Package Number H10C

Leadless Chip Carrier



20143708

Top View
See NS Package Number E20A



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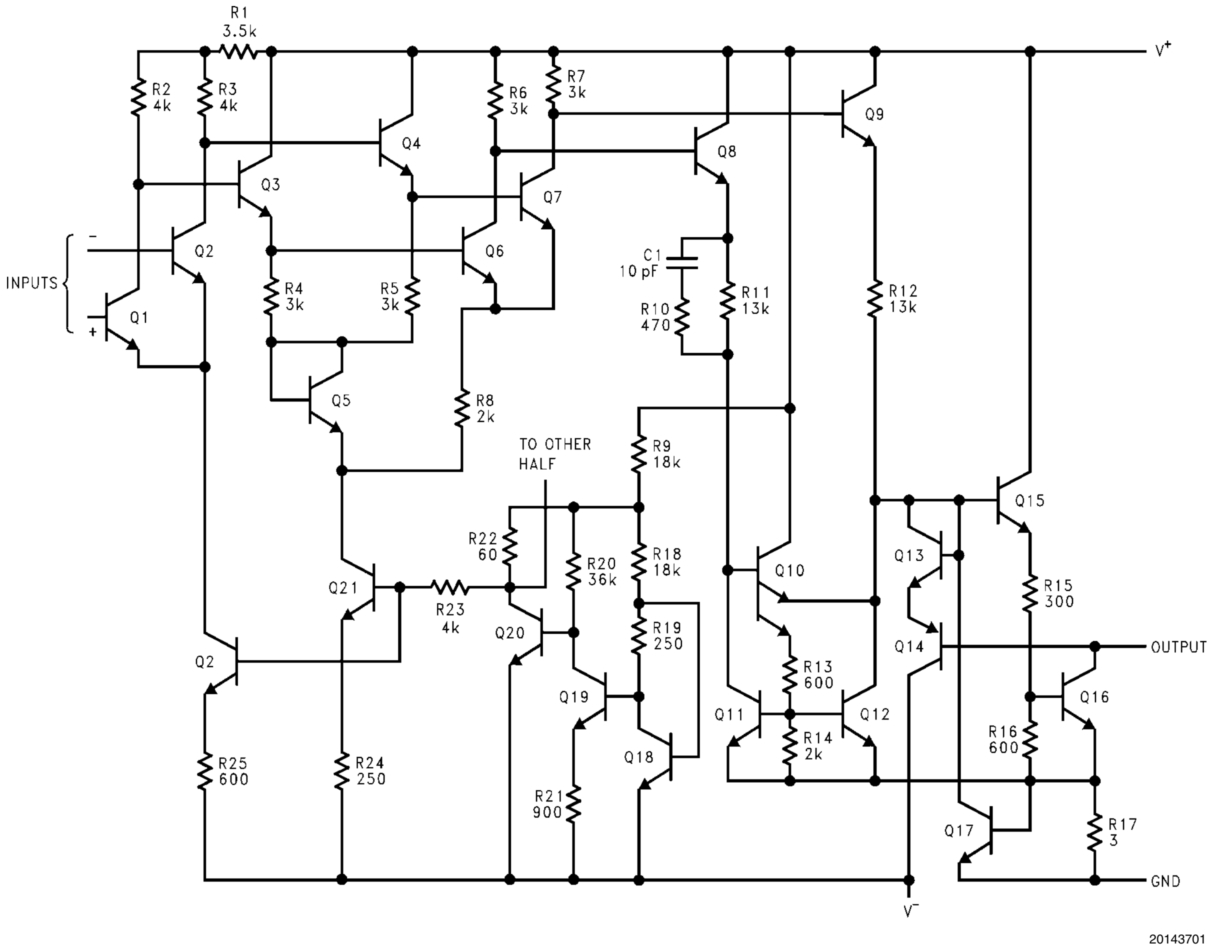
See NS Package Number W10A, WG10A

Schematic Diagram



*Do not operate the LM119 with more than 16V between GND and V+

Absolute Maximum Ratings (Note 2)

Total Supply Voltage	36V
Output to Negative Supply Voltage	36V
Ground to Negative Supply Voltage	25V
Ground to Positive Supply Voltage	18V
Differential Input Voltage	±5V
Input Voltage (Note 4)	±15V
Power Dissipation (Note 3)	500 mW
Output Short Circuit Duration	10 sec
Storage Temperature Range	$-65°C \leq T_A \leq 150°C$
Operating Ambient Temperature Range	$-55°C \leq T_A \leq 125°C$
Maximum Junction Temperature (T_J)	150°C
Lead Temperature (Soldering, 10 sec.)	260°C
Thermal Resistance	
θ_{JA}	
E Package (Still Air)	89°C/W
E Package (500LF/Min Air flow)	63°C/W
H Package (Still Air)	162°C/W
H Package (500LF/Min Air flow)	88°C/W
J Package (Still Air)	94°C/W
J Package (500LF/Min Air flow)	52°C/W
W Package (Still Air)	215°C/W
W Package (500LF/Min Air flow)	132°C/W
WG Package (Still Air)	215°C/W
WG Package (500LF/Min Air flow)	132°C/W
θ_{JC}	
E Package	5°C/W
H Package	31°C/W
J Package	11°C/W
W Package	13°C/W
WG Package	13°C/W
Package Weight	
E Package	TBD
H Package	TBD
J Package	TBD
W Package	TBD
WG Package	225mg
ESD rating (Note 5)	800V

Quality Conformance Inspection

Mil-Std-883, Method 5005 - Group A

Subgroup	Description	Temp °C
1	Static tests at	25
2	Static tests at	125
3	Static tests at	-55
4	Dynamic tests at	25
5	Dynamic tests at	125
6	Dynamic tests at	-55
7	Functional tests at	25
8A	Functional tests at	125
8B	Functional tests at	-55
9	Switching tests at	25
10	Switching tests at	125
11	Switching tests at	-55
12	Settling time at	25
13	Settling time at	125
14	Settling time at	-55

LM119/883 Electrical Characteristics

DC Parameters

The following conditions apply, unless otherwise specified. $V_{CM} = 0V$

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
$+I_{CC}$	Positive Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low			11	mA	1
		$V^+ = 5.6V$ thru $1.4K\Omega$			11.5	mA	2
$-I_{CC}$	Negative Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low		-4.2		mA	1
		$V^+ = 5.6V$ thru $1.4K\Omega$		-4.5		mA	2
I_{Leak}	Output Leakage Current	$^+V_{CC} = 15V$, $^-V_{CC} = -1V$, $V_{Gnd} = 0V$, $V_O = 35V$, $V_I = 5mV$			1.8	µA	1
					9.5	µA	2
					10.0	µA	3
I_{IB}	Input Bias Current	$\pm V_{CC} = \pm 15V$			0.475	µA	1
					0.95	µA	2, 3
		$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, $V_{CM} = 1.5V$			0.475	µA	1
					.95	µA	2, 3
V_{IO}	Input Offset Voltage	$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, $V_{CM} = 1V$, $R_S \leq 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
		$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, $V_{CM} = 3V$, $R_S \leq 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$, $R_S \leq 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$, $R_S \leq 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
I_{IO}	Input Offset Current	$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, $V_{CM} = 1V$		-75	75	nA	1
				-100	100	nA	2, 3
		$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, $V_{CM} = 3V$		-75	75	nA	1
				-100	100	nA	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$		-75	75	nA	1
				-100	100	nA	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$		-75	75	nA	1
				-100	100	nA	2, 3
V_{Sat}	Output Saturation Voltage	$\pm V_{CC} = \pm 15V$, $I_O = 25mA$, $V_I = -5mV$			1.5	V	1
		$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, $I_O = 4.0mA$	(Note 12)		0.4	V	1, 2
			(Note 12)		0.6	V	3
A_V	Voltage Gain	$\pm V_{CC} = \pm 15V$, Delta $V_O = 12V$, $R_L = 1.4K\Omega$	(Note 9), (Note 10)	10.5		K	4
			(Note 9), (Note 10)	10		K	5, 6
		$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, Delta $V_O = 4.5V$, $R_L = 1.4K\Omega$	(Note 9), (Note 11)	8.0		K	4
			(Note 9), (Note 11)	5.0		K	5
			(Note 9), (Note 11)	5.8		K	6

LM119-SMD Electrical Characteristics SMD 8601401

DC Parameters

The following conditions apply, unless otherwise specified. $V_{CM} = 0V$

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
$+I_{CC}$	Positive Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low $V^+ = 5.6V$ thru $1.4K\Omega$			11	mA	1
					11.5	mA	2, 3
$-I_{CC}$	Negative Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low $V^+ = 5.6V$ thru $1.4K\Omega$		-4.2		mA	1
				-4.5		mA	2
				-6.0		mA	3
I_{Leak}	Output Leakage Current	$^{+}V_{CC} = 15V$, $^{-}V_{CC} = -1V$, $V_{Gnd} = 0V$, $V_O = 35V$	(Note 6)		1.8	µA	1
			(Note 6)		10	µA	2, 3
I_{IB}	Input Bias Current	$\pm V_{CC} = \pm 15V$			0.475	µA	1
					0.95	µA	2, 3
		$^{+}V_{CC} = 5V$	(Note 7)		0.475	µA	1
			(Note 7)		.95	µA	2, 3
V_{IO}	Input Offset Voltage	$^{+}V_{CC} = 5V$, $V_{CM} = 1V$, $R_S \leq 5K\Omega$	(Note 7)	-3.8	3.8	mV	1
			(Note 7)	-6.8	6.8	mV	2, 3
		$^{+}V_{CC} = 5V$, $V_{CM} = 3V$, $R_S \leq 5K\Omega$	(Note 7)	-3.8	3.8	mV	1
			(Note 7)	-6.8	6.8	mV	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$, $R_S \leq 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$, $R_S \leq 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
I_{IO}	Input Offset Current	$^{+}V_{CC} = 5V$, $V_{CM} = 1V$	(Note 7)	-75	75	nA	1
			(Note 7)	-100	100	nA	2, 3
		$^{+}V_{CC} = 5V$, $V_{CM} = 3V$	(Note 7)	-75	75	nA	1
			(Note 7)	-100	100	nA	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$		-75	75	nA	1
				-100	100	nA	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$		-75	75	nA	1
				-100	100	nA	2, 3
V_I	Input Voltage Range	$^{+}V_{CC} = 5V$	(Note 7), (Note 8)	1.0	3.0	V	1, 2, 3
		$\pm V_{CC} = \pm 15V$	(Note 8)	-12	12	V	1, 2, 3
V_{Sat}	Output Saturation Voltage	$\pm V_{CC} = \pm 15V$, $I_O = 25mA$, $V_I \leq -5mV$	(Note 6)		1.5	V	1, 2, 3
		$^{+}V_{CC} = 3.5V$, $^{-}V_{CC} = -1V$, $V_I \leq -6mV$, $I_O \leq 3.2mA$			0.4	V	1, 2
					0.6	V	3
A_V	Voltage Gain	$\pm V_{CC} = \pm 15V$, Delta $V_O = 12V$, $R_L = 1.4K\Omega$	(Note 9)	10.5		K	4
			(Note 9)	10		K	5, 6
		$^{+}V_{CC} = 5V$, $^{-}V_{CC} = 0V$, Delta $V_O = 4.5V$, $R_L = 1.4K\Omega$	(Note 7), (Note 9)	8.0		K	4
			(Note 7), (Note 9)	5.0		K	5
			(Note 7), (Note 9)	5.8		K	6
CMRR	Common Mode Rejection Ratio	$\pm V_{CC} = \pm 15V$, $V_{CM} = \pm 12V$		80		dB	4

LM119 Electrical Characteristics SMD 5962-9679801, HIGH DOSE RATE

DC Parameters

The following conditions apply, unless otherwise specified. $V_{CM} = 0V$

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
$+I_{CC}$	Positive Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low $V^+ = 5.6V$ thru $1.4K\Omega$			11	mA	1
					11.5	mA	2, 3
$-I_{CC}$	Negative Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low $V^+ = 5.6V$ thru $1.4K\Omega$		-4.2		mA	1
				-4.5		mA	2
				-6.0		mA	3
I_{Leak}	Output Leakage Current	$^+V_{CC} = 15V$, $^-V_{CC} = -1V$, $V_{Gnd} = 0V$, $V_O = 35V$	(Note 6)		1.8	µA	1
			(Note 6)		10	µA	2, 3
I_{IB}	Input Bias Current	$\pm V_{CC} = \pm 15V$			0.475	µA	1
					0.95	µA	2, 3
		$^+V_{CC} = 5V$	(Note 7)		0.475	µA	1
			(Note 7)		.95	µA	2, 3
V_{IO}	Input Offset Voltage	$^+V_{CC} = 5V$, $V_{CM} = 1V$, $R_S \le 5K\Omega$	(Note 7)	-3.8	3.8	mV	1
			(Note 7)	-6.8	6.8	mV	2, 3
		$^+V_{CC} = 5V$, $V_{CM} = 3V$, $R_S \le 5K\Omega$	(Note 7)	-3.8	3.8	mV	1
			(Note 7)	-6.8	6.8	mV	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$, $R_S \le 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$, $R_S \le 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
I_{IO}	Input Offset Current	$^+V_{CC} = 5V$, $V_{CM} = 1V$	(Note 7)	-75	75	nA	1
			(Note 7)	-100	100	nA	2, 3
		$^+V_{CC} = 5V$, $V_{CM} = 3V$	(Note 7)	-75	75	nA	1
			(Note 7)	-100	100	nA	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$		-75	75	nA	1
				-100	100	nA	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$		-75	75	nA	1
				-100	100	nA	2, 3
V_I	Input Voltage Range	$^+V_{CC} = 5V$	(Note 7), (Note 8)	1.0	3.0	V	1, 2, 3
		$\pm V_{CC} = \pm 15V$	(Note 8)	-12	12	V	1, 2, 3
V_{Sat}	Output Saturation Voltage	$\pm V_{CC} = \pm 15V$, $I_O = 25mA$, $V_I \le -5mV$	(Note 6)		1.5	V	1, 2, 3
		$^+V_{CC} = 3.5V$, $^-V_{CC} = -1V$, $V_I \le -6mV$, $I_O \le 3.2mA$			0.4	V	1, 2
					0.6	V	3
A_V	Voltage Gain	$\pm V_{CC} = \pm 15V$, Delta $V_O = 12V$, $R_L = 1.4K\Omega$	(Note 9)	10.5		K	4
			(Note 9)	10		K	5, 6
		$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, Delta $V_O = 4.5V$, $R_L = 1.4K\Omega$	(Note 7), (Note 9)	8.0		K	4
			(Note 7), (Note 9)	5.0		K	5
			(Note 7), (Note 9)	5.8		K	6
CMRR	Common Mode Rejection Ratio	$\pm V_{CC} = \pm 15V$, $V_{CM} = \pm 12V$		80		dB	4

SMD 5962-9679801, HIGH DOSE RATE DC DELTA Parameters

The following conditions apply, unless otherwise specified.

V_{CM} = 0V, Delta calculations performed on QMLV devices at group B, subgroup 5 only.

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
$+I_{CC}$	Positive Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low $V^+ = 5.6V$ thru 1.4KΩ		-1.0	1.0	mA	1
$-I_{CC}$	Negative Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low $V^+ = 5.6V$ thru 1.4KΩ		-0.5	0.5	mA	1
V_{IO}	Input Offset Voltage	$^+V_{CC} = 5V$, $V_{CM} = 1V$, $R_S \leq 5K\Omega$		-0.4	0.4	mV	1

SMD 5962-9679801, High Dose Rate 100K Post Radiation Parameters @ 25°C

(Note 13)

The following conditions apply, unless otherwise specified. V_{CM} = 0V

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
I_{IB}	Input Bias Current	$\pm V_{CC} = \pm 15V$			1.0	µA	1
		$V_{CC} = 5V$			1.0	µA	1
V_{IO}	Input Offset Voltage	$^+V_{CC} = 5V$, $V_{CM} = 1V$, $R_S \leq 5K\Omega$		-4.0	4.0	mV	1
		$^+V_{CC} = 5V$, $V_{CM} = 3V$, $R_S \leq 5K\Omega$		-4.0	4.0	mV	1
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$, $R_S \leq 5K\Omega$		-4.0	4.0	mV	1
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$, $R_S \leq 5K\Omega$		-4.0	4.0	mV	1

LM119 Electrical Characteristics SMD 5962-9679802, ELDRS FREE

DC Parameters

The following conditions apply, unless otherwise specified. $V_{CM} = 0V$

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
$+I_{CC}$	Positive Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low $V^+ = 5.6V$ thru $1.4K\Omega$			11	mA	1
					11.5	mA	2, 3
$-I_{CC}$	Negative Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low $V^+ = 5.6V$ thru $1.4K\Omega$		-4.2		mA	1
				-4.5		mA	2
				-6.0		mA	3
I_{Leak}	Output Leakage Current	$^+V_{CC} = 15V$, $^-V_{CC} = -1V$, $V_{Gnd} = 0V$, $V_O = 35V$	(Note 6)		1.8	µA	1
			(Note 6)		10	µA	2, 3
I_{IB}	Input Bias Current	$\pm V_{CC} = \pm 15V$			0.475	µA	1
					0.95	µA	2, 3
		$^+V_{CC} = 5V$	(Note 7)		0.475	µA	1
			(Note 7)		.95	µA	2, 3
V_{IO}	Input Offset Voltage	$^+V_{CC} = 5V$, $V_{CM} = 1V$, $R_S \le 5K\Omega$	(Note 7)	-3.8	3.8	mV	1
			(Note 7)	-6.8	6.8	mV	2, 3
		$^+V_{CC} = 5V$, $V_{CM} = 3V$, $R_S \le 5K\Omega$	(Note 7)	-3.8	3.8	mV	1
			(Note 7)	-6.8	6.8	mV	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$, $R_S \le 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$, $R_S \le 5K\Omega$		-3.8	3.8	mV	1
				-6.8	6.8	mV	2, 3
I_{IO}	Input Offset Current	$^+V_{CC} = 5V$, $V_{CM} = 1V$	(Note 7)	-75	75	nA	1
			(Note 7)	-100	100	nA	2, 3
		$^+V_{CC} = 5V$, $V_{CM} = 3V$	(Note 7)	-75	75	nA	1
			(Note 7)	-100	100	nA	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$		-75	75	nA	1
				-100	100	nA	2, 3
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$		-75	75	nA	1
				-100	100	nA	2, 3
V_I	Input Voltage Range	$^+V_{CC} = 5V$	(Note 8), (Note 8)	1.0	3.0	V	1, 2, 3
		$\pm V_{CC} = \pm 15V$	(Note 8)	-12	12	V	1, 2, 3
V_{Sat}	Output Saturation Voltage	$\pm V_{CC} = \pm 15V$, $I_O = 25mA$, $V_I \le -5mV$	(Note 6)		1.5	V	1, 2, 3
		$^+V_{CC} = 3.5V$, $^-V_{CC} = -1V$, $V_I \le -6mV$, $I_O \le 3.2mA$			0.4	V	1, 2
					0.6	V	3
A_V	Voltage Gain	$\pm V_{CC} = \pm 15V$, Delta $V_O = 12V$, $R_L = 1.4K\Omega$	(Note 9)	10.5		K	4
			(Note 9)	10		K	5, 6
		$^+V_{CC} = 5V$, $^-V_{CC} = 0V$, Delta $V_O = 4.5V$, $R_L = 1.4K\Omega$	(Note 7), (Note 9)	8.0		K	4
			(Note 7), (Note 9)	5.0		K	5
			(Note 7), (Note 9)	5.8		K	6
CMRR	Common Mode Rejection Ratio	$\pm V_{CC} = \pm 15V$, $V_{CM} = \pm 12V$		80		dB	4

SMD 5962-9679802, ELDRS FREE DC DELTA Parameters

The following conditions apply, unless otherwise specified.

V_{CM} = 0V, Delta calculations performed on QMLV devices at group B, subgroup 5 only.

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
$+I_{CC}$	Positive Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low V^+ = 5.6V thru 1.4KΩ		-1.0	1.0	mA	1
$-I_{CC}$	Negative Supply Current	$\pm V_{CC} = \pm 15V$, V_O = Low V^+ = 5.6V thru 1.4KΩ		-0.5	0.5	mA	1
V_{IO}	Input Offset Voltage	$^+V_{CC} = 5V$, $V_{CM} = 1V$, $R_S \le 5K\Omega$		-0.4	0.4	mV	1

SMD 5962-9679802, ELDRS FREE 100K Post Radiation Parameters @ 25°C

(Note 14)

The following conditions apply, unless otherwise specified. V_{CM} = 0V

Symbol	Parameter	Conditions	Notes	Min	Max	Units	Sub-groups
I_{IB}	Input Bias Current	$\pm V_{CC} = \pm 15V$			1.0	µA	1
		$V_{CC} = 5V$			1.0	µA	1
V_{IO}	Input Offset Voltage	$^+V_{CC} = 5V$, $V_{CM} = 1V$, $R_S \le 5K\Omega$		-4.0	4.0	mV	1
		$^+V_{CC} = 5V$, $V_{CM} = 3V$, $R_S \le 5K\Omega$		-4.0	4.0	mV	1
		$\pm V_{CC} = \pm 15V$, $V_{CM} = 12V$, $R_S \le 5K\Omega$		-4.0	4.0	mV	1
		$\pm V_{CC} = \pm 15V$, $V_{CM} = -12V$, $R_S \le 5K\Omega$		-4.0	4.0	mV	1

Note 2: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not guarantee specific performance limits. For guaranteed specifications and test conditions, see the Electrical Characteristics. The guaranteed specifications apply only for the test conditions listed. Some performance characteristics may degrade when the device is not operated under the listed test conditions.

Note 3: The maximum power dissipation must be derated at elevated temperatures and is dictated by T_{Jmax} (maximum junction temperature), θ_{JA} (package junction to ambient thermal resistance), and T_A (ambient temperature). The maximum allowable power dissipation at any temperature is $P_{Dmax} = (T_{Jmax} - T_A)/\theta_{JA}$ or the number given in the Absolute Maximum Ratings, whichever is lower.

Note 4: For supply voltages less than ±15V the absolute maximum input voltage is equal to the supply voltage.

Note 5: Human Body model, 1.5KΩ in series with 100pF.

Note 6: $V_I \geq 8mV$ at extremes for I_{Leak} and $V_I \leq -8mV$ at extremes for V_{Sat} (V_I to exceed V_{OS}.

Note 7: 5V differential across $+V_{CC}$ and $-V_{CC}$.

Note 8: Parameter guaranteed by V_{IO} and I_{IO} tests.

Note 9: K = V/mV.

Note 10: Gain is computed with an output swing from +13.5V to +1.5V.

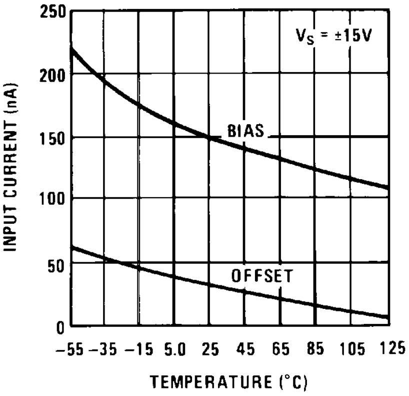
Note 11: Gain is computed with an output swing from +5.0V to +0.5V.

Note 12: Output is monitored by measuring V_I with limits from 0 to 6mV at all temperatures

Note 13: Pre and post irradiation limits are identical to those listed under AC and DC electrical characteristics except as listed in the Post Radiation Limits Table. These parts may be dose rate sensitive in a space environment and demonstrate enhanced low dose rate sensitivity. Radiation end point limits for the noted parameters are guaranteed only for the conditions as specified in MIL-STD-883, per Test Method 1019, Condition A.

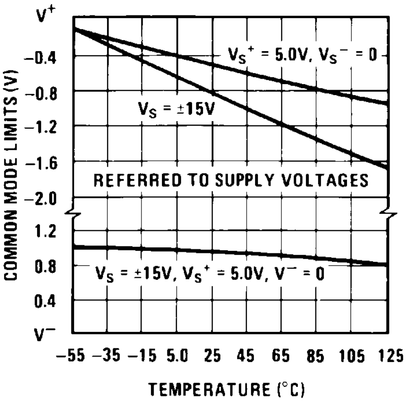
Note 14: Pre and post irradiation limits are identical to those listed under AC and DC electrical characteristics except as listed in the Post Radiation Limits Table. Low dose rate testing has been performed on a wafer-by-wafer basis, per Test Method 1019, Condition D of MIL-STD-883, with no enhanced low dose rate sensitivity (ELDRS).

Typical Performance Characteristics



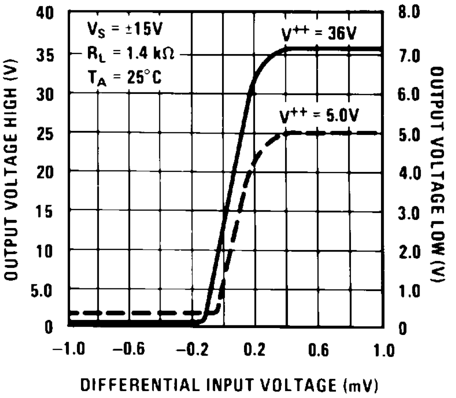
Input Currents

20143710



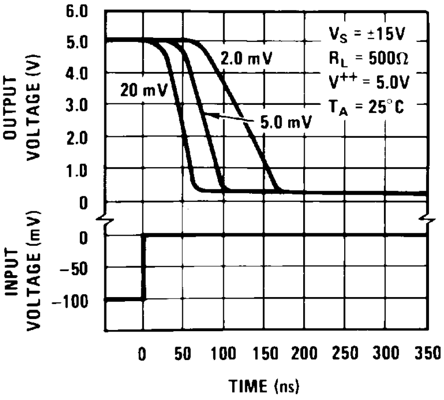
Common Mode Limits

20143711



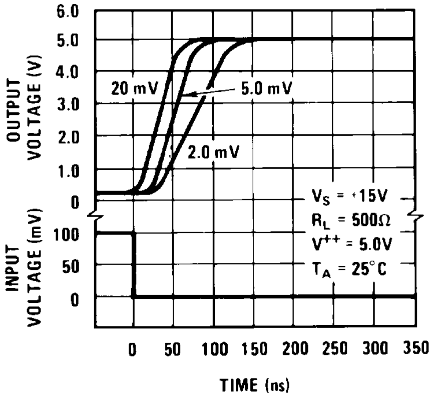
Transfer Function

20143712



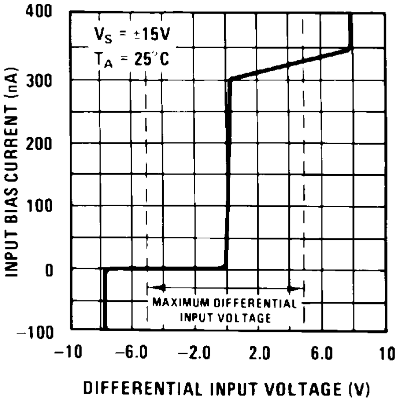
Response Time for Various Input Overdrives

20143713



Response Time for Various Input Overdrives

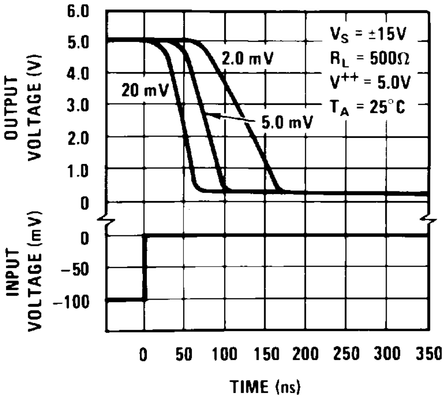
20143714



Input Characteristics

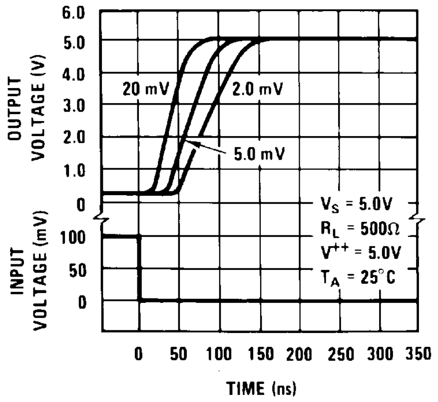
20143715

Response Time for Various Input Overdrives



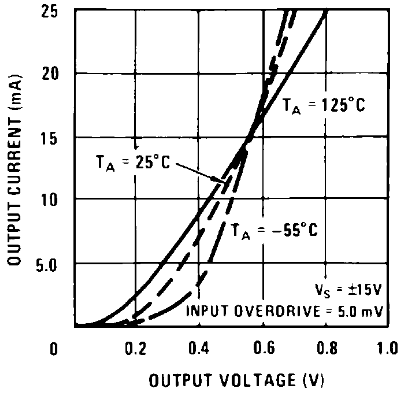
20143716

Response Time for Various Input Overdrives



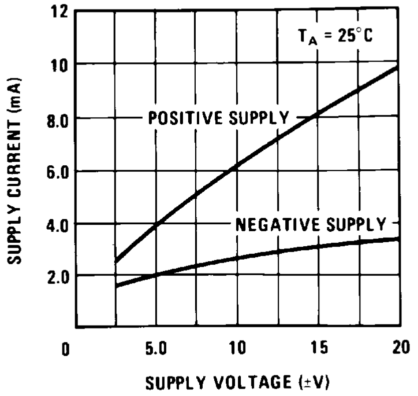
20143717

Output Saturation Voltage



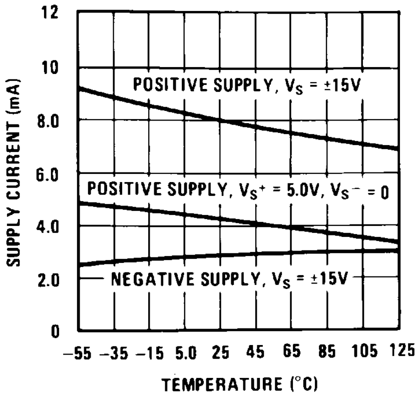
20143718

Supply Current



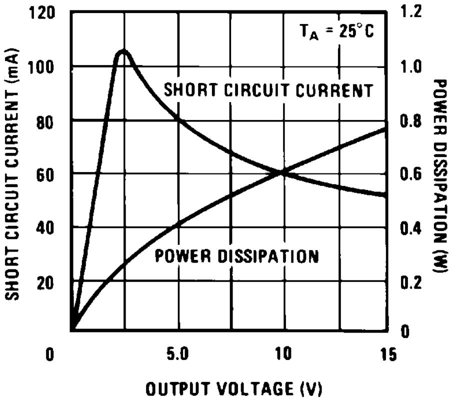
20143719

Supply Current



20143720

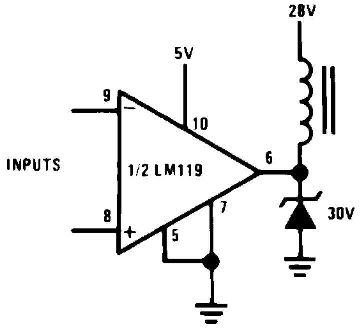
Output Limiting Characteristics



20143721

Typical Applications (Note Pin numbers are for metal can package.)

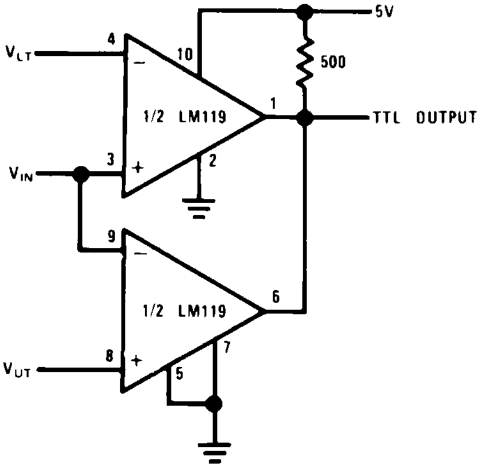
Relay Driver



20143705

Note 15: Pin numbers are for metal can package.

Window Detector



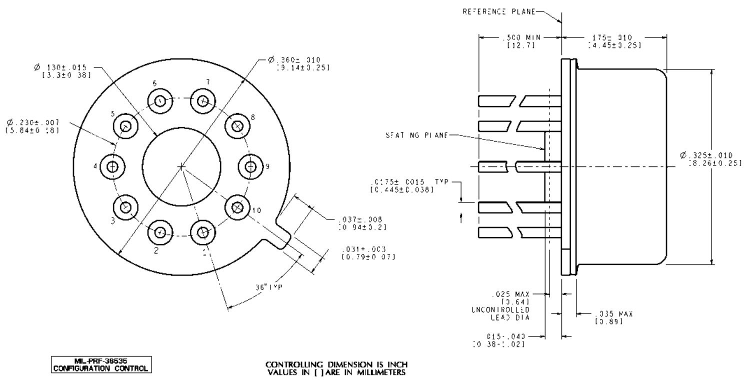
20143706

V_{OUT} = 5V for $V_{LT} \leq V_{IN} \leq V_{UT}$
V_{OUT} = 0 for $V_{IN} \leq V_{LT}$or $V_{IN} \geq V_{UT}$

Revision History

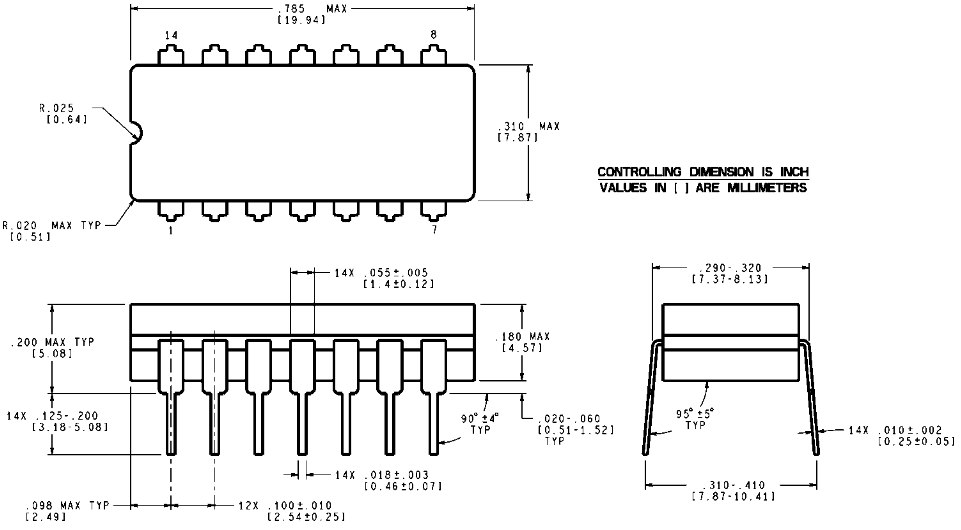
Date Released	Revision	Section	Originator	Changes
07/24/08	A	New release to corporate format	L. Lytle	2 MDS datasheets converted into one corporate data sheet format. Added Radiation information. MDS data sheets MNLM119-X Rev. 0F1 & MDLM119-X Rev 2A2 will be archived.
01/13/09	B	Features, Ordering Info., Electrical Section, Notes 13 and 14	Larry McGee	Added reference to ELDRS and Die NSID's to data sheet. Correction from: 100k rd(Si) to 100 krad(Si) in ordering info. Changed wording in Notes 13 and 14 Revision A will be Archived.

Physical Dimensions inches (millimeters) unless otherwise noted



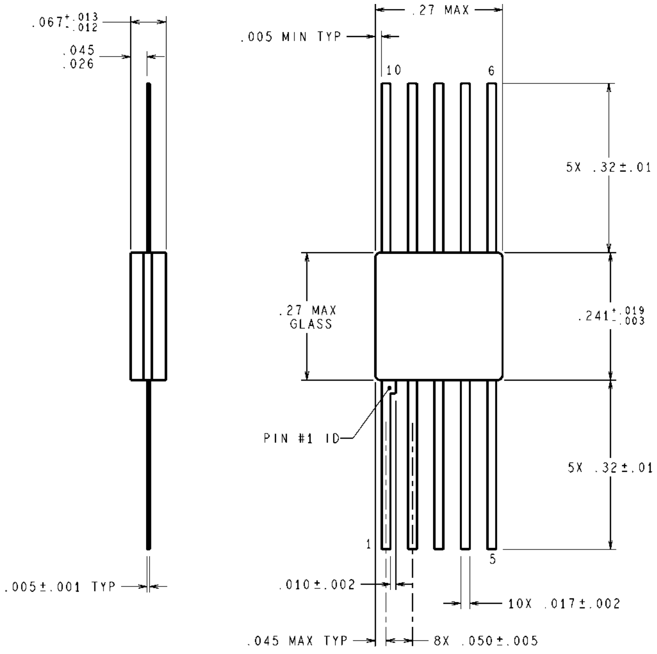
H10C (Rev G)

Metal Can Package (H)
NS Package Number H10C



J14A (Rev J)

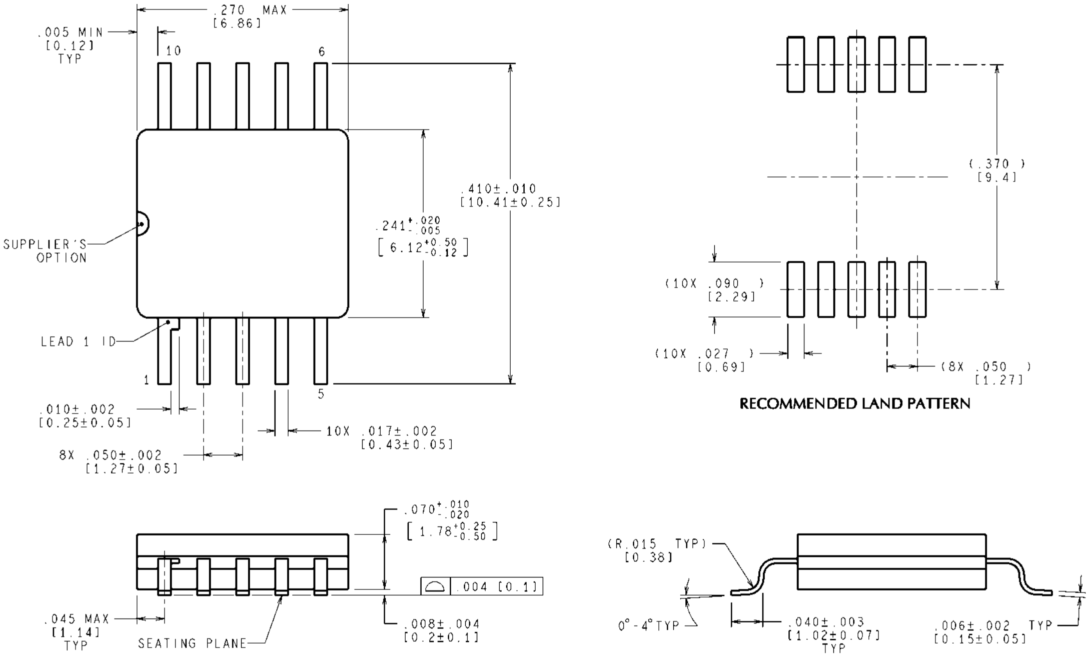
Cavity Dual-In-Line Package (J)
NS Package Number J14A



DIMENSIONS ARE IN INCHES

W10A (Rev H)

Ceramic Flatpack (W)
NS Package Number W10A

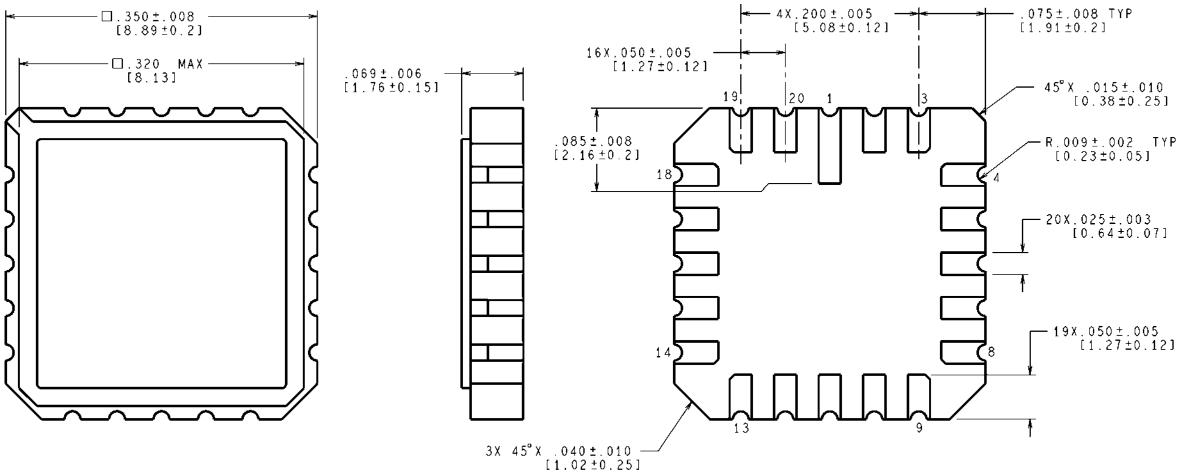


MIL-PRF-38535
CONFIGURATION CONTROL

CONTROLLING DIMENSION IS INCH
VALUES IN [ ] ARE MILLIMETERS
DIMENSIONS IN ( ) FOR REFERENCE ONLY

WG10A (Rev F)

Ceramic SOIC (WG)
NS Package Number WG10A



CONTROLLING DIMENSION IS INCH
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E20A (Rev F)

Metal Leadless Chip Carrier (LCC)
NS Package Number E20A

Notes

Notes

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