



February 2006

LM140JAN

Three Terminal Positive Regulators

General Description

The monolithic 3-terminal positive voltage regulators employ internal current-limiting, thermal shutdown and safe-area compensation, making them essentially indestructible. If adequate heat sinking is provided, they can deliver over 0.5A and 1.0A output current. They are intended as fixed voltage regulators in a wide range of applications including local (on-card) regulation for elimination of noise and distribution problems associated with single-point regulation. In addition to use as fixed voltage regulators, these devices can be used with external components to obtain adjustable output voltages and currents.

Considerable effort was expended to make the entire series of regulators easy to use and minimize the number of exter-

nal components. It is not necessary to bypass the output, although this does improve transient response. Input bypassing is needed only if the regulator is located far from the filter capacitor of the power supply.

Features

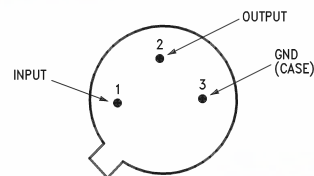
- Complete specifications at 0.5A and 1.0A loads
- No external components
- Internal thermal overload protection
- Internal short circuit current-limiting
- Output transistor safe-area compensation

Ordering Information

NS Part Number	SMD Part Number	NS Package Number	Package Description
JL140-5BXA	JM38510/10702BXA	H03A	3LD TO-39 Metal Can
JL140-5BYA	JM38510/10706BYA	K02C	2LD TO-3 Metal Can
JL140-5SXA	JM38510/10702SXA	H03A	3LD TO-39 Metal Can
JL140-5SYA	JM38510/10706SYA	K02C	2LD TO-3 Metal Can
JL140-12BXA	JM38510/10703BXA	H03A	3LD TO-39 Metal Can
JL140-12BYA	JM38510/10707BYA	K02C	2LD TO-3 Metal Can
JL140-12SXA	JM38510/10703SXA	H03A	3LD TO-39 Metal Can
JL140-15BXA	JM38510/10704BXA	H03A	3LD TO-39 Metal Can
JL140-15BYA	JM38510/10708BYA	K02C	2LD TO-3 Metal Can
JL140-15SYA	JM38510/10708SYA	K02C	2LD TO-3 Metal Can

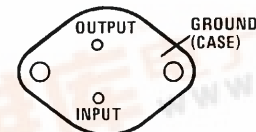
Connection Diagrams

Steel Metal Can TO-39 Package (H)



Bottom View
See NS Package Number H03A

TO-3 Metal Can (K)



Bottom View
See NS Package Number K02C

LM140JAN Three Terminal Positive Regulators

Absolute Maximum Ratings (Note 1)

DC Input Voltage	35V
Internal Power Dissipation (Note 2)	Internally Limited
Maximum Junction Temperature (T_{Jmax})	150°C
Storage Temperature Range	-65°C ≤ T_A ≤ +150°C
Operating Temperature Range	-55°C ≤ T_A ≤ +125°C
Lead Temperature (Soldering 10 seconds)	300°C
Thermal Resistance	
θ_{JA}	
T0-5 (Still Air)	232°C/W
T0-5 (500 LF/Min Air Flow)	77°C/W
T0-3 (Still Air)	35°C/W
T0-3 (500 LF/Min Air Flow)	TBD
θ_{JC}	
T0-5	15°C/W
T0-3	4°C/W
ESD Susceptibility (Note 3)	2KV

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

LM140H-5.0 (JL140-5BXA, SXA) JAN Electrical Characteristics

DC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O (1)	Output Voltage	$V_I = 8V, I_L = -5mA$		4.75	5.25	V	1, 2, 3
		$V_I = 8V, I_L = -500mA$		4.75	5.25	V	1, 2, 3
		$V_I = 20V, I_L = -5mA$		4.75	5.25	V	1, 2, 3
		$V_I = 20V, I_L = -500mA$		4.75	5.25	V	1, 2, 3
		$V_I = 35V, I_L = -5mA$		4.75	5.25	V	1, 2, 3
		$V_I = 35V, I_L = -50mA$		4.75	5.25	V	1, 2, 3
V_{RLine}	Line Regulation	$8V \leq V_I \leq 35V, I_L = -50mA$		-150	150	mV	1, 2, 3
		$8V \leq V_I \leq 25V, I_L = -350mA$		-50	50	mV	1, 2, 3
V_{RLoad}	Load Regulation	$V_I = 10V, -500mA \leq I_L \leq -5mA$		-100	100	mV	1, 2, 3
		$V_I = 35V, -50mA \leq I_L \leq -5mA$		-150	150	mV	1, 2, 3
I_{SCD}	Stand by Current Drain	$V_I = 10V, I_L = -5mA$		-7.0	-0.5	mA	1, 2, 3
		$V_I = 35V, I_L = -5mA$		-8.0	-0.5	mA	1, 2, 3
$\Delta I_{SCD} \text{ Line}$	Stand by I_{Drain} vs. V_{Line}	$8V \leq V_I \leq 35V, I_L = -5mA$		-1.0	1.0	mA	1, 2, 3
$\Delta I_{SCD} \text{ Load}$	Stand by I_{Drain} vs. I_{Load}	$V_I = 10V, -500mA \leq I_L \leq -5mA$		-0.5	0.5	mA	1, 2, 3
I_{OL}	Overload Current	$V_I = 8V, \text{Forced } \Delta V_O = -0.48V$		-2.0	-0.5	A	1, 2, 3
I_{OS}	Output Short Circuit Current	$V_I = 10V$		-2.0	-0.01	A	1, 2, 3
		$V_I = 25V$		-1.5	-0.01	A	1, 2, 3
		$V_I = 35V$		-1.0	-0.01	A	1, 2, 3
V_O (2)	Output Voltage	$V_I = 10V, I_L = -5mA$	(Note 4)	4.7	5.3	V	2
V_O (3)	Output Voltage	$V_I = 10V, I_L = -5mA$	(Note 5)	4.75	5.25	V	7, 8A, 8B
$\Delta V_O / \Delta T$	Average Temperature Coefficient of Output Voltage	$V_I = 10V, I_L = -5mA, 25^\circ C \leq T_A \leq 125^\circ C$	(Note 6)	-2.0	2.0	mV/ $^\circ C$	8A
		$V_I = 10V, I_L = -5mA, -55^\circ C \leq T_A \leq 25^\circ C$	(Note 6)	-2.0	2.0	mV/ $^\circ C$	8B

AC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
NO	Output Noise Voltage	$V_I = 10V, I_L = -50mA$			125	μV_{RMS}	7
$\Delta V_O / \Delta V_I$	Transient Line Response	$V_I = 10V, I_L = -5mA, V_{Pulse} = 3V$			30	mV/V	7
$\Delta V_O / \Delta I_L$	Transient Load Response	$V_I = 10V, \Delta I_L = -200mA, I_L = -50mA$			2.5	mV/mA	7
$\Delta V_I / \Delta V_O$	Ripple Rejection	$V_I = 10V, I_L = -125mA, e_i = 1V_{RMS} \text{ at } f = 2400Hz,$		60		dB	4

DC Drift Parameters

Delta calculations performed on JAN S devices at group B, Subgroup 5, only.

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O	Output Voltage	$V_I = 8V, I_L = -5mA$		-0.025	0.025	V	1
		$V_I = 8V, I_L = -500mA$		-0.025	0.025	V	1
		$V_I = 20V, I_L = -5mA$		-0.025	0.025	V	1
		$V_I = 20V, I_L = -500mA$		-0.025	0.025	V	1
		$V_I = 35V, I_L = -5mA$		-0.025	0.025	V	1
		$V_I = 35V, I_L = -50mA$		-0.025	0.025	V	1
I_{SCD}	Stand by Current Drain	$V_I = 10V, I_L = -5mA$		-20	20	%	1

LM140H-12 (JL140-12BXA, SXA) JAN Electrical Characteristics

DC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O (1)	Output Voltage	$V_I = 15V, I_L = -5mA$		11.4	12.6	V	1, 2, 3
		$V_I = 15V, I_L = -0.5A$		11.4	12.6	V	1, 2, 3
		$V_I = 27V, I_L = -5mA$		11.4	12.6	V	1, 2, 3
		$V_I = 27V, I_L = -0.5A$		11.4	12.6	V	1, 2, 3
		$V_I = 35V, I_L = -5mA$		11.4	12.6	V	1, 2, 3
		$V_I = 35V, I_L = -50mA$		11.4	12.6	V	1, 2, 3
V_{RLine}	Line Regulation	$15V \leq V_I \leq 35V, I_L = -50mA$		-360	360	mV	1, 2, 3
		$15V \leq V_I \leq 32V, I_L = -350mA$		-120	120	mV	1, 2, 3
V_{RLoad}	Load Regulation	$V_I = 17V, -500mA \leq I_L \leq -5mA$		-240	240	mV	1, 2, 3
		$V_I = 35V, -50mA \leq I_L \leq -5mA$		-360	360	mV	1, 2, 3
I_{SCD}	Stand by Current Drain	$V_I = 17V, I_L = -5mA$		-7.0	-0.5	mA	1, 2, 3
		$V_I = 35V, I_L = -5mA$		-8.0	-0.5	mA	1, 2, 3
$\Delta I_{SCD} \text{ Line}$	Stand by I_{Drain} vs. V_{Line}	$15V \leq V_I \leq 35V, I_L = -5mA$		-1.0	1.0	mA	1, 2, 3
$\Delta I_{SCD} \text{ Load}$	Stand by I_{Drain} vs. I_{Load}	$V_I = 17V, -500mA \leq I_L \leq -5mA$		-0.5	0.5	mA	1, 2, 3
I_{OL}	Over Load Current	$V_I = 15V, \Delta V_O = -1.13V$		-2.0	-0.5	A	1, 2, 3
I_{OS}	Output Short Circuit Current	$V_I = 17V$		-1.75	-0.01	A	1, 2, 3
		$V_I = 32V$		-1.25	-0.01	A	1, 2, 3
		$V_I = 35V$		-1.00	-0.01	A	1, 2, 3
V_O (2)	Output Voltage	$V_I = 17V, I_L = -5mA$	(Note 4)	11.28	12.72	V	2
V_O (3)	Output Voltage	$V_I = 17V, I_L = -5mA$	(Note 5)	11.4	12.6	V	7, 8A, 8B
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	$25^\circ C \leq T_A \leq +125^\circ C, V_I = 17V, I_L = -5mA$	(Note 7)	-3.0	3.0	mV/ $^\circ C$	8A
		$-55^\circ C \leq T_A \leq 25^\circ C, V_I = 17V, I_L = -5mA$	(Note 7)	-3.0	3.0	mV/ $^\circ C$	8B

AC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
NO	Output Noise Voltage	$V_I = 17V, I_L = -50mA$			250	μV_{RMS}	7
$\Delta V_O / \Delta I_L$	Transient Load Response	$V_I = 17V, I_L = -50mA, \Delta I_L = -200mA$			2.5	mV/mA	7
$\Delta V_O / \Delta V_I$	Transient Line Response	$V_I = 17V, V_{Pulse} = 3V, I_L = -5mA$			30	mV/V	7
$\Delta V_I / \Delta V_O$	Ripple Rejection	$V_I = 17V, I_L = -125mA, e_i = 1V_{RMS} \text{ at } f = 2400Hz$		55		dB	4

DC Drift Parameters

Delta calculations performed on JAN S devices at group B, Subgroup 5, only.

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O	Output Voltage	$V_I = 15V, I_L = -5mA$		-0.06	0.06	V	1
		$V_I = 15V, I_L = -0.5A$		-0.06	0.06	V	1
		$V_I = 27V, I_L = -5mA$		-0.06	0.06	V	1
		$V_I = 27V, I_L = -0.5A$		-0.06	0.06	V	1
		$V_I = 35V, I_L = -5mA$		-0.06	0.06	V	1
		$V_I = 35V, I_L = -50mA$		-0.06	0.06	V	1
I_{SCD}	Stand by Current Drain	$V_I = 17V, I_L = -5mA$		-20	20	%	1

LM140H-15 (JL140-15BXA) JAN Electrical Characteristics

DC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O (1)	Output Voltage	$V_I = 18.5V, I_L = -5mA$		14.25	15.75	V	1, 2, 3
		$V_I = 18.5V, I_L = -500mA$		14.25	15.75	V	1, 2, 3
		$V_I = 30V, I_L = -5mA$		14.25	15.75	V	1, 2, 3
		$V_I = 30V, I_L = -500mA$		14.25	15.75	V	1, 2, 3
		$V_I = 35V, I_L = -5mA$		14.25	15.75	V	1, 2, 3
		$V_I = 35V, I_L = -50mA$		14.25	15.75	V	1, 2, 3
V_{RLine}	Line Regulation	$18.5V \leq V_I \leq 35V, I_L = -350mA$		-150	150	mV	1, 2, 3
V_{RLOAD}	Load Regulation	$-500mA \leq I_L \leq -5mA, V_I = 20V$		-300	300	mV	1, 2, 3
		$-50mA \leq I_L \leq -5mA, V_I = 35V$		-450	450	mV	1, 2, 3
I_{SCD}	Stand by Current Drain	$V_I = 20V, I_L = -5mA$		-7.0	-0.5	mA	1, 2, 3
		$V_I = 35V, I_L = -5mA$		-8.0	-0.5	mA	1, 2, 3
$\Delta I_{SCD} \text{ Line}$	Stand by I_{Drain} vs. V_{Line}	$18.5V \leq V_I \leq 35V, I_L = -5mA$		-1.0	1.0	mA	1, 2, 3
$\Delta I_{SCD} \text{ Load}$	Stand by I_{Drain} vs. I_{Load}	$-500mA \leq I_L \leq -5mA, V_I = 20V$		-0.5	0.5	mA	1, 2, 3
I_{OL}	Overload Current	Forced $\Delta V_O = -1.43V$, $V_I = 18.5V$		-2.0	-0.5	A	1, 2, 3
I_{OS}	Output Short Circuit Current	$V_I = 20V$		-1.75	-0.01	A	1, 2, 3
	Output Short Circuit Current	$V_I = 35V$		-1.0	-0.01	A	1, 2, 3
V_O (2)	Output Voltage	$V_I = 20V, I_L = -5mA$	(Note 4)	14.1	15.9	V	2
V_O (3)	Output Voltage	$V_I = 20V, I_L = -5mA$	(Note 5)	14.25	15.75	V	7, 8A, 8B
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	$25^\circ C \leq T_A \leq +125^\circ C$, $V_I = 20V, I_L = -5mA$	(Note 7)	-3.75	3.75	mV/ $^\circ C$	8A
	Average Temperature Coefficient Output Voltage	$-55^\circ C \leq T_A \leq 25^\circ C$, $V_I = 20V, I_L = -5mA$	(Note 7)	-3.75	3.75	mV/ $^\circ C$	8B

AC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
NO	Output Noise Voltage	$V_I = 20V, I_L = -50mA$			300	μV_{RMS}	7
$\Delta V_O / \Delta I_L$	Transient Load Response	$\Delta I_L = -200mA, V_I = 20V$, $I_L = -50mA$			2.5	mV/mA	7
$\Delta V_O / \Delta V_I$	Transient Line Response	$V_I = 20V, I_L = -5mA$, $V_{Pulse} = 3V$			30	mV/V	7
$\Delta V_I / \Delta V_O$	Ripple Rejection	$V_I = 20V, I_L = -125mA$, $e_i = 1V_{RMS}$ at $f = 2400Hz$		53		dB	4

DC Drift Parameters

Delta calculations performed on JAN S devices at group B, Subgroup 5, only.

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O	Output Voltage	$V_I = 18.5V, I_L = -5mA$		-0.075	0.075	V	1
		$V_I = 18.5V, I_L = -500mA$		-0.075	0.075	V	1
		$V_I = 30V, I_L = -5mA$		-0.075	0.075	V	1
		$V_I = 30V, I_L = -500mA$		-0.075	0.075	V	1
		$V_I = 35V, I_L = -5mA$		-0.075	0.075	V	1
		$V_I = 35V, I_L = -50mA$		-0.075	0.075	V	1
I_{SCD}	Stand by Current Drain	$V_I = 20V, I_L = -5mA$		-20	20	%	1

LM140K-5.0 (JL140-5BYA, SYA) JAN Electrical Characteristics

DC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O (1)	Output Voltage	$V_I = 8V, I_L = -5mA$		4.75	5.25	V	1, 2, 3
		$V_I = 8V, I_L = -1A$		4.75	5.25	V	1, 2, 3
		$V_I = 20V, I_L = -5mA$		4.75	5.25	V	1, 2, 3
		$V_I = 20V, I_L = -1A$		4.75	5.25	V	1, 2, 3
		$V_I = 35V, I_L = -5mA$		4.75	5.25	V	1, 2, 3
		$V_I = 35V, I_L = -0.1A$		4.75	5.25	V	1, 2, 3
V_{RLine}	Line Regulation	$8V \leq V_I \leq 35V, I_L = -0.1A$		-150	150	mV	1, 2, 3
		$8V \leq V_I \leq 25V, I_L = -0.5A$		-50	50	mV	1, 2, 3
V_{RLoad}	Load Regulation	$V_I = 10V, -1A \leq I_L \leq -5mA$		-100	100	mV	1, 2, 3
		$V_I = 35V, -0.1A \leq I_L \leq -5mA$		-150	150	mV	1, 2, 3
I_{SCD}	Stand by Current Drain	$V_I = 10V, I_L = -5mA$		-7.0	-0.5	mA	1, 2, 3
		$V_I = 35V, I_L = -5mA$		-8.0	-0.5	mA	1, 2, 3
$\Delta I_{SCD} \text{ Line}$	Stand by I_{Drain} vs. V_{Line}	$8V \leq V_I \leq 35V, I_L = -5mA$		-1.0	1.0	mA	1, 2, 3
$\Delta I_{SCD} \text{ Load}$	Stand by I_{Drain} vs. I_{Load}	$V_I = 10V, -1A \leq I_L \leq -5mA$		-0.5	0.5	mA	1, 2, 3
I_{OL}	Overload Current	$V_I = 8V, \text{Forced } \Delta V_O = -0.48V$		-4.0	-1.0	A	1, 2, 3
I_{OS}	Output Short Circuit Current	$V_I = 10V$		-4.0	-0.02	A	1, 2, 3
		$V_I = 25V$		-3.0	-0.02	A	1, 2, 3
		$V_I = 35V$		-2.0	-0.02	A	1, 2, 3
V_O (2)	Output Voltage	$V_I = 10V, I_L = -5mA$	(Note 4)	4.7	5.3	V	2
V_O (3)	Output Voltage	$V_I = 10V, I_L = -5mA$	(Note 5)	4.75	5.25	V	7, 8A, 8B
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	$V_I = 10V, I_L = -5mA, 25^\circ C \leq T_A \leq 125^\circ C$	(Note 6)	-2.0	2.0	mV/ $^\circ C$	8A
		$V_I = 10V, I_L = -5mA, -55^\circ C \leq T_A \leq 25^\circ C$	(Note 6)	-2.0	2.0	mV/ $^\circ C$	8B

AC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
NO	Output Noise Voltage	$V_I = 10V, I_L = -0.1A$			125	μV_{RMS}	7
$\Delta V_O / \Delta V_I$	Transient Line Response	$V_I = 10V, V_{Pulse} = 3V, I_L = -5mA$			30	mV/V	7
$\Delta V_O / \Delta I_L$	Transient Load Response	$V_I = 10V, \Delta I_L = -400mA, I_L = -100mA$			2.5	mV/mA	7
$\Delta V_I / \Delta V_O$	Ripple Rejection	$V_I = 10V, I_L = -350mA, e_i = 1V_{RMS} \text{ at } f = 2400Hz$		60		dB	4

DC Drift Parameters

Delta calculations performed on JAN S devices at group B, Subgroup 5, only.

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O	Output Voltage	$V_I = 8V, I_L = -5mA$		-0.025	0.025	V	1
		$V_I = 8V, I_L = -1A$		-0.025	0.025	V	1
		$V_I = 20V, I_L = -5mA$		-0.025	0.025	V	1
		$V_I = 20V, I_L = -1A$		-0.025	0.025	V	1
		$V_I = 35V, I_L = -5mA$		-0.025	0.025	V	1
		$V_I = 35V, I_L = -0.1A$		-0.025	0.025	V	1
I_{SCD}	Stand by Current Drain	$V_I = 10V, I_L = -5mA$		-20	20	%	1

LM140K-12 (JL140-12BYA) JAN Electrical Characteristics

DC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O (1)	Output Voltage	$V_I = 15V, I_L = -5mA$		11.4	12.6	V	1, 2, 3
		$V_I = 15V, I_L = -1A$		11.4	12.6	V	1, 2, 3
		$V_I = 27V, I_L = -5mA$		11.4	12.6	V	1, 2, 3
		$V_I = 27V, I_L = -1A$		11.4	12.6	V	1, 2, 3
		$V_I = 35V, I_L = -5mA$		11.4	12.6	V	1, 2, 3
		$V_I = 35V, I_L = -0.1A$		11.4	12.6	V	1, 2, 3
V_{RLine}	Line Regulation	$15V \leq V_I \leq 35V, I_L = -0.1A$		-360	360	mV	1, 2, 3
		$15V \leq V_I \leq 32V, I_L = -0.5A$		-120	120	mV	1, 2, 3
V_{RLoad}	Load Regulation	$V_I = 17V, -1A \leq I_L \leq -5mA$		-240	240	mV	1, 2, 3
		$V_I = 35V, -0.1A \leq I_L \leq -5mA$		-360	360	mV	1, 2, 3
I_{SCD}	Stand by Current Drain	$V_I = 17V, I_L = -5mA$		-7.0	-0.5	mA	1, 2, 3
		$V_I = 35V, I_L = -5mA$		-8.0	-0.5	mA	1, 2, 3
$\Delta I_{SCD} \text{ Line}$	Stand by I_{Drain} vs. V_{Line}	$15V \leq V_I \leq 35V, I_L = -5mA$		-1.0	1.0	mA	1, 2, 3
$\Delta I_{SCD} \text{ Load}$	Stand by I_{Drain} vs. I_{Load}	$V_I = 17V, -1A \leq I_L \leq -5mA$		-0.5	0.5	mA	1, 2, 3
I_{OL}	Over Load Current	Forced $\Delta V_O = -1.13V, V_I = 15V$		-4.0	-1.0	A	1, 2, 3
I_{OS}	Output Short Circuit Current	$V_I = 17V$		-3.5	-0.02	A	1, 2, 3
		$V_I = 32V$		-2.5	-0.02	A	1, 2, 3
		$V_I = 35V$		-2.0	-0.02	A	1, 2, 3
V_O (2)	Output Voltage	$V_I = 17V, I_L = -5mA$	(Note 4)	11.28	12.72	V	2
V_O (3)	Output Voltage	$V_I = 17V, I_L = -5mA$	(Note 5)	11.4	12.6	V	7, 8A, 8B
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	$25^\circ C \leq T_A \leq +125^\circ C, V_I = 17V, I_L = -5mA$	(Note 7)	-3.0	3.0	mV/ $^\circ C$	8A
		$-55^\circ C \leq T_A \leq 25^\circ C, V_I = 17V, I_L = -5mA$	(Note 7)	-3.0	3.0	mV/ $^\circ C$	8B

AC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sup - groups
NO	Output Noise Voltage	$V_I = 17V, I_L = -0.1A$			250	μV_{RMS}	7
$\Delta V_O / \Delta I_L$	Transient Load Response	$V_I = 17V, I_L = -100mA, \Delta I_L = -400mA$			2.5	mV/mA	7
$\Delta V_O / \Delta V_I$	Transient Line Response	$V_I = 17V, V_{Pulse} = 3V, I_L = -5mA$			30	mV/V	7
$\Delta V_I / \Delta V_O$	Ripple Rejection	$V_I = 17V, e_I = 1V_{RMS}$ at $f = 2400Hz, I_L = -350mA$		55		dB	4

DC Drift Parameters

Delta calculations performed on JAN S devices at group B, Subgroup 5, only.

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O	Output Voltage	$V_I = 15V, I_L = -5mA$		-0.06	0.06	V	1
		$V_I = 15V, I_L = -1A$		-0.06	0.06	V	1
		$V_I = 27V, I_L = -5mA$		-0.06	0.06	V	1
		$V_I = 27V, I_L = -1A$		-0.06	0.06	V	1
		$V_I = 35V, I_L = -5mA$		-0.06	0.06	V	1
		$V_I = 35V, I_L = -0.1A$		-0.06	0.06	V	1
I_{SCD}	Stand by Current Drain	$V_I = 17V, I_L = -5mA$		-20	20	%	1

LM140K-15 (JL140-15BYA, SYA) JAN Electrical Characteristics

DC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O (1)	Output Voltage	$V_I = 18.5V, I_L = -5mA$		14.25	15.75	V	1, 2, 3
		$V_I = 18.5V, I_L = -1A$		14.25	15.75	V	1, 2, 3
		$V_I = 30V, I_L = -5mA$		14.25	15.75	V	1, 2, 3
		$V_I = 30V, I_L = -1A$		14.25	15.75	V	1, 2, 3
		$V_I = 35V, I_L = -5mA$		14.25	15.75	V	1, 2, 3
		$V_I = 35V, I_L = -0.1A$		14.25	15.75	V	1, 2, 3
V_{RLine}	Line Regulation	$18.5V \leq V_I \leq 35V, I_L = -0.5A$		-150	150	mV	1, 2, 3
V_{RLoad}	Load Regulation	$V_I = 20V, -1A \leq I_L \leq -5mA$		-300	300	mV	1, 2, 3
		$V_I = 35V, -0.1A \leq I_L \leq -5mA$		-450	450	mV	1, 2, 3
I_{SCD}	Stand by Current Drain	$V_I = 20V, I_L = -5mA$		-7.0	-0.5	mA	1, 2, 3
		$V_I = 35V, I_L = -5mA$		-8.0	-0.5	mA	1, 2, 3
$\Delta I_{SCD} \text{ Line}$	Stand by I_{Drain} vs. V_{Line}	$18.5V \leq V_I \leq 35V, I_L = -5mA$		-1.0	1.0	mA	1, 2, 3
$\Delta I_{SCD} \text{ Load}$	Stand by I_{Drain} vs. I_{Load}	$V_I = 20V, -1A \leq I_L \leq -5mA$		-0.5	0.5	mA	1, 2, 3
I_{OL}	Overload Current	Forced $\Delta V_O = -1.43V$, $V_I = 18.5V$		-4.0	-1.0	A	1, 2, 3
I_{OS}	Output Short Circuit Current	$V_I = 20V$		-3.5	-0.02	A	1, 2, 3
		$V_I = 35V$		-2.0	-0.02	A	1, 2, 3
V_O (2)	Output Voltage	$V_I = 20V, I_L = -5mA$	(Note 4)	14.1	15.9	V	2
V_O (3)	Output Voltage	$V_I = 20V, I_L = -5mA$	(Note 5)	14.25	15.75	V	7, 8A, 8B
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	$25^\circ C \leq T_A \leq +125^\circ C$, $V_I = 20V, I_L = -5mA$	(Note 8)	-3.75	3.75	mV/ $^\circ C$	8A
		$-55^\circ C \leq T_A \leq 25^\circ C$, $V_I = 20V, I_L = -5mA$	(Note 8)	-3.75	3.75	mV/ $^\circ C$	8B

AC Parameters

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
NO	Output Noise Voltage	$V_I = 20V, I_L = -0.1A$			300	μV_{RMS}	7
$\Delta V_O / \Delta I_L$	Transient Load Response	$\Delta I_L = -400mA, V_I = 20V$, $I_L = -100mA$			2.5	mV/mA	7
$\Delta V_O / \Delta V_I$	Transient Line Response	$V_I = 20V, V_{Pulse} = 3V$, $I_L = -5mA$			30	mV/V	7
$\Delta V_I / \Delta V_O$	Ripple Rejection	$V_I = 20V, I_L = -350mA$, $e_i = 1V_{RMS}$ at $f = 2400Hz$		53		dB	4

DC Drift Parameters

Delta calculations performed on JAN S devices at group B, Subgroup 5, only.

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
V_O	Output Voltage	$V_I = 18.5V, I_L = -5mA$		-0.075	0.075	V	1
		$V_I = 18.5V, I_L = -1A$		-0.075	0.075	V	1
		$V_I = 30V, I_L = -5mA$		-0.075	0.075	V	1
		$V_I = 30V, I_L = -1A$		-0.075	0.075	V	1
		$V_I = 35V, I_L = -5mA$		-0.075	0.075	V	1
		$V_I = 35V, I_L = -0.1A$		-0.075	0.075	V	1
I_{SCD}	Stand by Current Drain	$V_I = 20V, I_L = -5mA$		-20	20	%	1

Note 1: 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 2: 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 3: Human body model, 100pF discharged through 1.5K Ω

Note 4: Tested at $T_A = +125^\circ\text{C}$, correlated to $T_A = +150^\circ\text{C}$.

Note 5: Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

Note 6: Calculated parameter. For calculations use V_O @ $V_I = 10\text{V}$, $I_L = -5\text{mA}$.(Note 5)

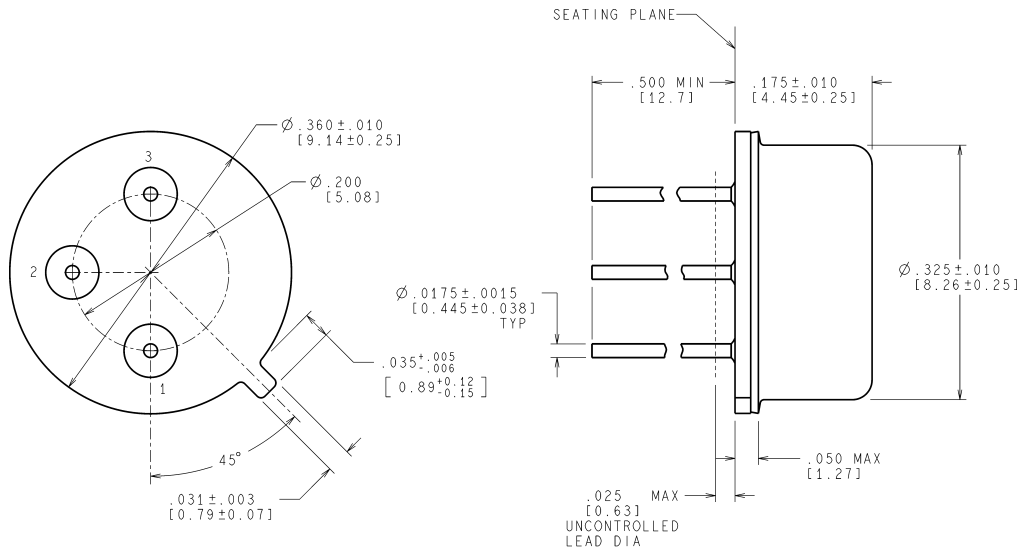
Note 7: Calculated parameter. For calculations use V_O @ $V_I = 17\text{V}$, $I_L = -5\text{mA}$.(Note 5)

Note 8: Calculated parameter. For calculations use V_O @ $V_I = 20\text{V}$, $I_L = -5\text{mA}$.(Note 5)

Revision History

Released	Revision	Section	Originator	Changes
02/07/06	A	New Release, Corporate format	L. Lytle	6 MDS data sheets converted into one Corp. data sheet format. The drift tables were eliminated from the 883 section since it did not apply. MDS data sheets MJLM140-05-H Rev 0B0, MJLM140-05-K Rev. 0B0, MJLM140-12-H Rev 0B0, MJLM140-12-K Rev 0B0, MJLM140-15-H Rev 0B0, and MJLM140-15-K Rev 0B0 will be archived.

Physical Dimensions inches (millimeters) unless otherwise noted

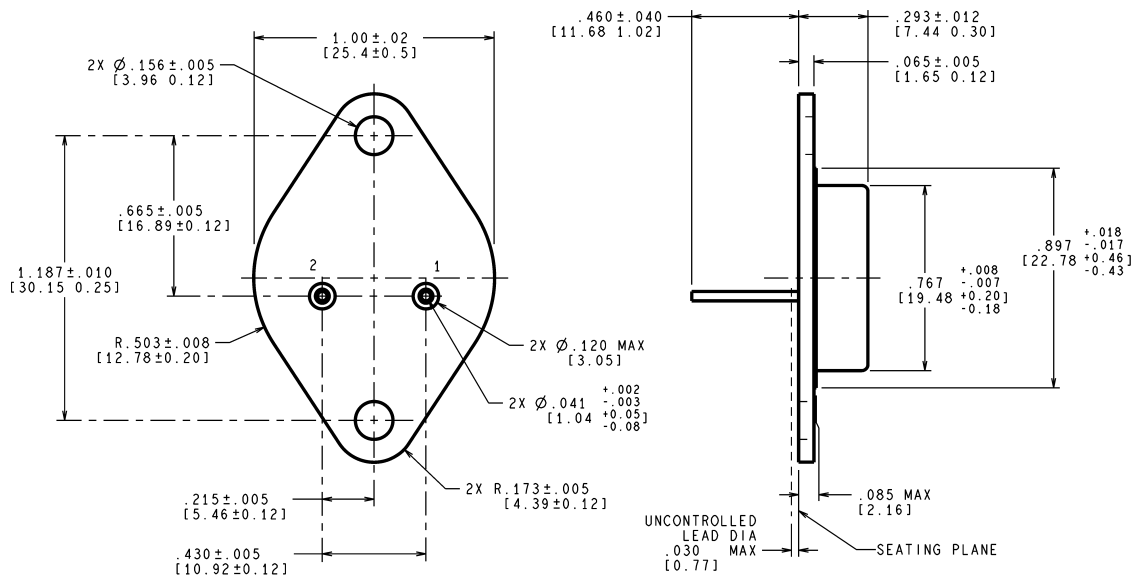


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MIL-PRF-38535
CONFIGURATION CONTROL

H03A (Rev D)

Metal Can TO-39 (H) NS Package Number H03A



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MIL-PRF-38535
CONFIGURATION CONTROL

K02C (Rev E)

Steel Metal Can Package (K) NS Package Number K02C

Notes

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**National Semiconductor
Americas Customer
Support Center**
Email: new.feedback@nsc.com
Tel: 1-800-272-9959

**National Semiconductor
Europe Customer Support Center**
Fax: +49 (0) 180-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 69 9508 6208
English Tel: +44 (0) 870 24 0 2171
Français Tel: +33 (0) 1 41 91 8790

**National Semiconductor
Asia Pacific Customer
Support Center**
Email: ap.support@nsc.com

**National Semiconductor
Japan Customer Support Center**
Fax: 81-3-5639-7507
Email: jpn.feedback@nsc.com
Tel: 81-3-5639-7560