LM140JAN Three Terminal Positive Regulators

Check for Samples: LM140JAN

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**

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 external 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.

Connection Diagrams

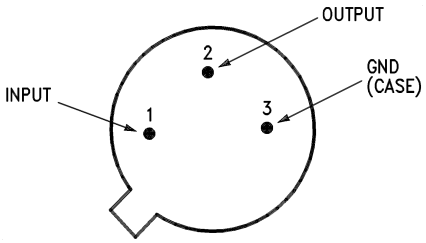

Figure 1. Steel Metal Can TO Package (NDT)
Bottom View
See Package Number NDT0003A

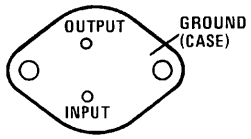

Figure 2. TO-3 Metal Can (K)
Bottom View
See Package Number K0002C

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

Absolute Maximum Ratings(1)

DC Input Voltage		35V
Internal Power Dissipation (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 (3)		2KV

(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 ensure specific performance limits. For ensured specifications and test conditions, see the Electrical Characteristics. The ensured specifications apply only for the test conditions listed. Some performance characteristics may degrade when the device is not operated under the listed test conditions.

(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.

(3) Human body model, 100pF discharged through 1.5KΩ

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 ≤ V_I ≤ 35V, I_L = -50mA		-150	150	mV	1, 2, 3
		8V ≤ V_I ≤ 25V, I_L = -350mA		-50	50	mV	1, 2, 3
V_{RLoad}	Load Regulation	V_I = 10V, -500mA ≤ I_L ≤ -5mA		-100	100	mV	1, 2, 3
		V_I = 35V, -50mA ≤ I_L ≤ -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
ΔI_{SCD} Line	Stand by I_{Drain} vs. V_{Line}	8V ≤ V_I ≤ 35V, I_L = -5mA		-1.0	1.0	mA	1, 2, 3
ΔI_{SCD} Load	Stand by I_{Drain} vs. I_{Load}	V_I = 10V, -500mA ≤ I_L ≤ -5mA		-0.5	0.5	mA	1, 2, 3
I_{OL}	Overload Current	V_I = 8V, Forced ΔV_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	(1)	4.7	5.3	V	2
V_O (3)	Output Voltage	V_I = 10V, I_L = -5mA	(2)	4.75	5.25	V	7, 8A, 8B
ΔV_O / ΔT	Average Temperature Coefficient of Output Voltage	V_I = 10V, I_L = -5mA, 25°C ≤ T_A ≤ 125°C	(3)	-2.0	2.0	mV/°C	8A
		V_I = 10V, I_L = -5mA, -55°C ≤ T_A ≤ 25°C	(3)	-2.0	2.0	mV/°C	8B

(1) Tested at T_A = +125°C, correlated to T_A = +150°C.
(2) Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.
(3) Calculated parameter. For calculations use V_O @ V_I = 10V, I_L = −5mA.; Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

LM140H-5.0 (JL140-5BXA, SXA) JAN Electrical Characteristics 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
ΔV_O / ΔV_I	Transient Line Response	V_I = 10V, I_L = -5mA, V_{Pulse} = 3V			30	mV/V	7
ΔV_O / ΔI_L	Transient Load Response	V_I = 10V, ΔI_L = -200mA, I_L = -50mA			2.5	mV/mA	7
ΔV_I / ΔV_O	Ripple Rejection	V_I = 10V, I_L = -125mA, e_I = $1V_{RMS}$ at f = 2400Hz,		60		dB	4

LM140H-5.0 (JL140-5BXA, SXA) JAN Electrical Characteristics 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 ≤ V_I ≤ 35V, I_L = -50mA		-360	360	mV	1, 2, 3
		15V ≤ V_I ≤ 32V, I_L = -350mA		-120	120	mV	1, 2, 3
V_{RLoad}	Load Regulation	V_I = 17V, -500mA ≤ I_L ≤ -5mA		-240	240	mV	1, 2, 3
		V_I = 35V, -50mA ≤ I_L ≤ -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
ΔI_{SCD} Line	Stand by I_{Drain} vs. V_{Line}	15V ≤ V_I ≤ 35V, I_L = -5mA		-1.0	1.0	mA	1, 2, 3
ΔI_{SCD} Load	Stand by I_{Drain} vs. I_{Load}	V_I = 17V, -500mA ≤ I_L ≤ -5mA		-0.5	0.5	mA	1, 2, 3
I_{OL}	Over Load Current	V_I = 15V, ΔV_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	(1)	11.28	12.72	V	2
V_O (3)	Output Voltage	V_I = 17V, I_L = -5mA	(2)	11.4	12.6	V	7, 8A, 8B

(1) Tested at T_A = +125°C, correlated to T_A = +150°C.
(2) Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

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

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	25°C ≤ T_A ≤ +125°C, V_I = 17V, I_L = -5mA	(3)	-3.0	3.0	mV/°C	8A
		-55°C ≤ T_A ≤ 25°C, V_I = 17V, I_L = -5mA	(3)	-3.0	3.0	mV/°C	8B

(3) Calculated parameter. For calculations use V_O @ V_I = 17V, I_L = −5mA..; Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

LM140H-12 (JL140-12BXA, SXA) JAN Electrical Characteristics 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, ΔI_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 = $1V_{RMS}$ at f = 2400Hz		55		dB	4

LM140H-12 (JL140-12BXA, SXA) JAN Electrical Characteristics 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 ≤ V_I ≤ 35V, I_L = -350mA		-150	150	mV	1, 2, 3
V_{RLOAD}	Load Regulation	-500mA ≤ I_L ≤ -5mA, V_I = 20V		-300	300	mV	1, 2, 3
		-50mA ≤ I_L ≤ -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
ΔI_{SCD} Line	Stand by I_{Drain} vs. V_{Line}	18.5V ≤ V_I ≤ 35V, I_L = -5mA		-1.0	1.0	mA	1, 2, 3
ΔI_{SCD} Load	Stand by I_{Drain} vs. I_{Load}	-500mA ≤ I_L ≤ -5mA, V_I = 20V		-0.5	0.5	mA	1, 2, 3

LM140H-15 (JL140-15BXA) JAN Electrical Characteristics DC Parameters (continued)

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
I_{OL}	Overload Current	Forced ΔV_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	(1)	14.1	15.9	V	2
V_O (3)	Output Voltage	V_I = 20V, I_L = -5mA	(2)	14.25	15.75	V	7, 8A, 8B
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	25°C ≤ T_A ≤ +125°C, V_I = 20V, I_L = -5mA	(3)	-3.75	3.75	mV/°C	8A
	Average Temperature Coefficient Output Voltage	-55°C ≤ T_A ≤ 25°C, V_I = 20V, I_L = -5mA	(3)	-3.75	3.75	mV/°C	8B

(1) Tested at T_A = +125°C, correlated to T_A = +150°C.
(2) Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.
(3) Calculated parameter. For calculations use V_O @ V_I = 17V, I_L = −5mA..; Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

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

LM140H-15 (JL140-15BXA) JAN Electrical Characteristics 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 ≤ V_I ≤ 35V, I_L = -0.1A		-150	150	mV	1, 2, 3
		8V ≤ V_I ≤ 25V, I_L = -0.5A		-50	50	mV	1, 2, 3
V_{RLoad}	Load Regulation	V_I = 10V, -1A ≤ I_L ≤ -5mA		-100	100	mV	1, 2, 3
		V_I = 35V, -0.1A ≤ I_L ≤ -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
ΔI_{SCD} Line	Stand by I_{Drain} vs. V_{Line}	8V ≤ V_I ≤ 35V, I_L = -5mA		-1.0	1.0	mA	1, 2, 3
ΔI_{SCD} Load	Stand by I_{Drain} vs. I_{Load}	V_I = 10V, -1A ≤ I_L ≤ -5mA		-0.5	0.5	mA	1, 2, 3
I_{OL}	Overload Current	V_I = 8V, Forced ΔV_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	(1)	4.7	5.3	V	2
V_O (3)	Output Voltage	V_I = 10V, I_L = -5mA	(2)	4.75	5.25	V	7, 8A, 8B
ΔV_O / ΔT	Average Temperature Coefficient Output Voltage	V_I = 10V, I_L = -5mA, 25°C ≤ T_A ≤ 125°C	(3)	-2.0	2.0	mV/°C	8A
		V_I = 10V, I_L = -5mA, -55°C ≤ T_A ≤ 25°C	(3)	-2.0	2.0	mV/°C	8B

(1) Tested at T_A = +125°C, correlated to T_A = +150°C.
(2) Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.
(3) Calculated parameter. For calculations use V_O @ V_I = 10V, I_L = −5mA.; Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

LM140K-5.0 (JL140-5BYA, SYA) JAN Electrical Characteristics 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
ΔV_O /Δ V_I	Transient Line Response	V_I = 10V, V_{Pulse} = 3V, I_L = -5mA			30	mV/V	7
ΔV_O /Δ I_L	Transient Load Response	V_I = 10V, ΔI_L = -400mA, I_L = -100mA			2.5	mV/mA	7
ΔV_I /Δ V_O	Ripple Rejection	V_I = 10V, I_L = -350mA, e_I = $1V_{RMS}$ at f = 2400Hz		60		dB	4

LM140K-5.0 (JL140-5BYA, SYA) JAN Electrical Characteristics 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 ≤ V_I ≤ 35V, I_L = -0.1A		-360	360	mV	1, 2, 3
		15V ≤ V_I ≤ 32V, I_L = -0.5A		-120	120	mV	1, 2, 3
V_{RLoad}	Load Regulation	V_I = 17V, -1A ≤ I_L ≤ -5mA		-240	240	mV	1, 2, 3
		V_I = 35V, -0.1A ≤ I_L ≤ -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
ΔI_{SCD} Line	Stand by I_{Drain} vs. V_{Line}	15V ≤ V_I ≤ 35V, I_L = -5mA		-1.0	1.0	mA	1, 2, 3
ΔI_{SCD} Load	Stand by I_{Drain} vs. I_{Load}	V_I = 17V, -1A ≤ I_L ≤ -5mA		-0.5	0.5	mA	1, 2, 3
I_{OL}	Over Load Current	Forced ΔV_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	(1)	11.28	12.72	V	2
V_O (3)	Output Voltage	V_I = 17V, I_L = -5mA	(2)	11.4	12.6	V	7, 8A, 8B

(1) Tested at T_A = +125°C, correlated to T_A = +150°C.
(2) Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

LM140K-12 (JL140-12BYA) JAN Electrical Characteristics DC Parameters (continued)

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	25°C ≤ T_A ≤ +125°C, V_I = 17V, I_L = -5mA	(3)	-3.0	3.0	mV/°C	8A
		-55°C ≤ T_A ≤ 25°C, V_I = 17V, I_L = -5mA	(3)	-3.0	3.0	mV/°C	8B

(3) Calculated parameter. For calculations use V_O @ V_I = 17V, I_L = −5mA..; Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

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

LM140K-12 (JL140-12BYA) JAN Electrical Characteristics 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 ≤ V_I ≤ 35V, I_L = -0.5A		-150	150	mV	1, 2, 3
V_{RLoad}	Load Regulation	V_I = 20V, -1A ≤ I_L ≤ -5mA		-300	300	mV	1, 2, 3
		V_I = 35V, -0.1A ≤ I_L ≤ -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
ΔI_{SCD} Line	Stand by I_{Drain} vs. V_{Line}	18.5V ≤ V_I ≤ 35V, I_L = -5mA		-1.0	1.0	mA	1, 2, 3
ΔI_{SCD} Load	Stand by I_{Drain} vs. I_{Load}	V_I = 20V, -1A ≤ I_L ≤ -5mA		-0.5	0.5	mA	1, 2, 3

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

Symbol	Parameter	Conditions	Notes	Min	Max	Unit	Sub-groups
I_{OL}	Overload Current	Forced ΔV_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	(1)	14.1	15.9	V	2
V_O (3)	Output Voltage	V_I = 20V, I_L = -5mA	(2)	14.25	15.75	V	7, 8A, 8B
$\Delta V_O / \Delta T$	Average Temperature Coefficient Output Voltage	25°C ≤ T_A ≤ +125°C, V_I = 20V, I_L = -5mA	(3)	-3.75	3.75	mV/°C	8A
		-55°C ≤ T_A ≤ 25°C, V_I = 20V, I_L = -5mA	(3)	-3.75	3.75	mV/°C	8B

(1) Tested at T_A = +125°C, correlated to T_A = +150°C.
(2) Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.
(3) Calculated parameter. For calculations use V_O @ V_I = 20V, I_L = −5mA..; Tested at extremes as a set up for $\Delta V_O/\Delta T$ tests.

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

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

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.

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