

500 mA Negative Voltage Regulators

Available in fixed output voltage options of -5.0 V , -8.0 V , -12 V and -15 V , these regulators employ current limiting, thermal shutdown, and safe-area compensation, making them remarkably rugged under most operating conditions. With adequate heatsinking they can deliver output currents in excess of 0.5 A .

- No External Components Required
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe-Area Compensation
- Also Available in Surface Mount DPAK (DT) Package
- Pb-Free Packages are Available

Device	Nominal Output Voltage
MC79M05	-5.0 V
MC79M08	-8.0 V
MC79M12	-12 V
MC79M15	-15 V



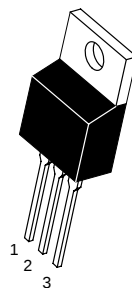
Figure 1. Representative Schematic Diagram



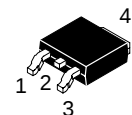
<http://onsemi.com>

THREE-TERMINAL NEGATIVE FIXED VOLTAGE REGULATORS

** C_D improve stability and transient response.

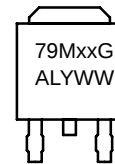


TO-220-3
T SUFFIX
CASE 221AB



DPAK-3
 DT SUFFIX
 CASE 369C

MC
79MxxYT
AWLYWWG



xx	= 05, 08, 12, or 15
y	= B or C
A	= Assembly Location
WL, L	= Wafer Lot
Y	= Year
WW	= Work Week
G	= Pb-Free Device

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

MC79M00 Series

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted.)

Rating	Symbol	Value	Unit
Input Voltage	V_I	-35	Vdc
Power Dissipation			
Case 221A (TO-220-3)			
$T_A = 25^\circ\text{C}$	P_D	Internally Limited	W
Thermal Resistance, Junction-to-Ambient	θ_{JA}	65	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	θ_{JC}	5.0	$^\circ\text{C/W}$
Case 369C (DPAK-3)			
$T_A = 25^\circ\text{C}$	P_D	Internally Limited	W
Thermal Resistance, Junction-to-Ambient	θ_{JA}	92	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	θ_{JC}	6.0	$^\circ\text{C/W}$
Storage Junction Temperature	T_{stg}	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-40 to +150	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

*This device series contains ESD protection and exceeds the following tests:

Human Body Model 2000 V per MIL_STD_883, Method 3015

Machine Model Method 200 V

MC79M05B, C

ELECTRICAL CHARACTERISTICS ($V_I = -10\text{ V}$, $I_O = 350\text{ mA}$, T_{low} to T_{high} (Note 2), unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	-4.8	-5.0	-5.2	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$ (Note 1) -7.0 Vdc $\geq V_I \geq$ -25 Vdc -8.0 Vdc $\geq V_I \geq$ -18 Vdc	Reg_{line}	- -	7.0 2.0	50 30	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 1) 5.0 mA $\leq I_O \leq$ 500 mA	Reg_{load}	-	30	100	mV
Output Voltage -7.0 Vdc $\geq V_I \geq$ -25 Vdc, 5.0 mA $\leq I_O \leq$ 350 mA	V_O	-4.75	-	-5.25	Vdc
Input Bias Current ($T_J = 25^\circ\text{C}$)	I_{IB}	-	4.3	8.0	mA
Input Bias Current Change -8.0 Vdc $\geq V_I \geq$ -25 Vdc, $I_O = 350\text{ mA}$ 5.0 mA $\leq I_O \leq$ 350 mA, $V_I = -10\text{ V}$	ΔI_{IB}	- -	- -	0.4 0.4	mA
Output Noise Voltage, $T_A = 25^\circ\text{C}$, 10 Hz $\leq f \leq$ 100 kHz	V_n	-	40	-	μV
Ripple Rejection ($f = 120\text{ Hz}$)	RR	54	66	-	dB
Dropout Voltage $I_O = 500\text{ mA}$, $T_J = 25^\circ\text{C}$	$V_I - V_O$	-	1.1	-	Vdc
Average Temperature Coefficient of Output Voltage $I_O = 5.0\text{ mA}$, $0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$	$\Delta V_O / \Delta T$	-	0.2	-	mV/ $^\circ\text{C}$

- Load and line regulation are specified at constant temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.
- $B = T_{low}$ to T_{high} , $-40^\circ\text{C} < T_J < 125^\circ\text{C}$ $C = T_{low}$ to T_{high} , $0^\circ\text{C} < T_J < 125^\circ\text{C}$.

MC79M00 Series

MC79M08B, C

ELECTRICAL CHARACTERISTICS ($V_I = -10\text{ V}$, $I_O = 350\text{ mA}$, T_{low} to T_{high} (Note 4), unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	-7.7	-8.0	-8.3	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$ (Note 3) -7.0 Vdc $\geq V_I \geq$ -25 Vdc -8.0 Vdc $\geq V_I \geq$ -18 Vdc	Reg_{line}	- -	5.0 3.0	80 50	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 3) $5.0\text{ mA} \leq I_O \leq 500\text{ mA}$	Reg_{load}	-	30	100	mV
Output Voltage -7.0 Vdc $\geq V_I \geq$ -25 Vdc, $5.0\text{ mA} \leq I_O \leq 350\text{ mA}$	V_O	-7.6	-8.0	-8.4	Vdc
Input Bias Current ($T_J = 25^\circ\text{C}$)	I_{IB}	-	-	8.0	mA
Input Bias Current Change -8.0 Vdc $\geq V_I \geq$ -25 Vdc, $I_O = 350\text{ mA}$ $5.0\text{ mA} \leq I_O \leq 350\text{ mA}$, $V_I = -10\text{ V}$	ΔI_{IB}	- -	- -	0.4 0.4	mA
Output Noise Voltage, $T_A = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	-	60	-	μV
Ripple Rejection ($f = 120\text{ Hz}$)	RR	54	63	-	dB
Dropout Voltage $I_O = 500\text{ mA}$, $T_J = 25^\circ\text{C}$	$V_I - V_O$	-	1.1	-	Vdc
Average Temperature Coefficient of Output Voltage $I_O = 5.0\text{ mA}$, $0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$	$\Delta V_O / \Delta T$	-	0.4	-	mV/ $^\circ\text{C}$

- Load and line regulation are specified at constant temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.
- $B = T_{low}$ to T_{high} , $-40^\circ\text{C} < T_J < 125^\circ\text{C}$
- $C = T_{low}$ to T_{high} , $0^\circ\text{C} < T_J < 125^\circ\text{C}$

MC79M12B, C

ELECTRICAL CHARACTERISTICS ($V_I = -19\text{ V}$, $I_O = 350\text{ mA}$, T_{low} to T_{high} (Note 6), unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	-11.5	-12	-12.5	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$ (Note 5) -14.5 Vdc $\geq V_I \geq$ -30 Vdc -15 Vdc $\geq V_I \geq$ -25 Vdc	Reg_{line}	- -	5.0 3.0	80 50	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 5) $5.0\text{ mA} \leq I_O \leq 500\text{ mA}$	Reg_{load}	-	30	240	mV
Output Voltage -14.5 Vdc $\geq V_I \geq$ -30 Vdc, $5.0\text{ mA} \leq I_O \leq 350\text{ mA}$	V_O	-11.4	-	-12.6	Vdc
Input Bias Current ($T_J = 25^\circ\text{C}$)	I_{IB}	-	4.4	8.0	mA
Input Bias Current Change -14.5 Vdc $\geq V_I \geq$ -30 Vdc, $I_O = 350\text{ mA}$ $5.0\text{ mA} \leq I_O \leq 350\text{ mA}$, $V_I = -19\text{ V}$	ΔI_{IB}	- -	- -	0.4 0.4	mA
Output Noise Voltage, $T_A = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	-	75	-	μV
Ripple Rejection ($f = 120\text{ Hz}$)	RR	54	60	-	dB
Dropout Voltage $I_O = 500\text{ mA}$, $T_J = 25^\circ\text{C}$	$V_I - V_O$	-	1.1	-	Vdc
Average Temperature Coefficient of Output Voltage $I_O = 5.0\text{ mA}$, $0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$	$\Delta V_O / \Delta T$	-	-0.8	-	mV/ $^\circ\text{C}$

- Load and line regulation are specified at constant temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.
- $B = T_{low}$ to T_{high} , $-40^\circ\text{C} < T_J < 125^\circ\text{C}$
- $C = T_{low}$ to T_{high} , $0^\circ\text{C} < T_J < 125^\circ\text{C}$

MC79M00 Series

MC79M15B, C

ELECTRICAL CHARACTERISTICS ($V_I = -23\text{ V}$, $I_O = 350\text{ mA}$, T_{low} to T_{high} (Note 8), unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ($T_J = 25^\circ\text{C}$)	V_O	-14.4	-15	-15.6	Vdc
Line Regulation, $T_J = 25^\circ\text{C}$ (Note 7) -17.5 Vdc $\geq V_I \geq -30\text{ Vdc}$ -18 Vdc $\geq V_I \geq -28\text{ Vdc}$	Reg_{line}	- -	5.0 3.0	80 50	mV
Load Regulation, $T_J = 25^\circ\text{C}$ (Note 7) $5.0\text{ mA} \leq I_O \leq 500\text{ mA}$	Reg_{load}	-	30	240	mV
Output Voltage -17.5 Vdc $\geq V_I \geq -30\text{ Vdc}$, $5.0\text{ mA} \leq I_O \leq 350\text{ mA}$	V_O	-14.25	-	-15.75	Vdc
Input Bias Current ($T_J = 25^\circ\text{C}$)	I_{IB}	-	4.4	8.0	mA
Input Bias Current Change -17.5 Vdc $\geq V_I \geq -30\text{ Vdc}$, $I_O = 350\text{ mA}$ $5.0\text{ mA} \leq I_O \leq 350\text{ mA}$, $V_I = -23\text{ V}$	ΔI_{IB}	- -	- -	0.4 0.4	mA
Output Noise Voltage, $T_A = 25^\circ\text{C}$, $10\text{ Hz} \leq f \leq 100\text{ kHz}$	V_n	-	90	-	μV
Ripple Rejection ($f = 120\text{ Hz}$)	RR	54	60	-	dB
Dropout Voltage $I_O = 500\text{ mA}$, $T_J = 25^\circ\text{C}$	$V_I - V_O$	-	1.1	-	Vdc
Average Temperature Coefficient of Output Voltage $I_O = 5.0\text{ mA}$, $0^\circ\text{C} \leq T_J \leq 125^\circ\text{C}$	$\Delta V_O / \Delta T$	-	-1.0	-	mV/ $^\circ\text{C}$

7. Load and line regulation are specified at constant temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.
8. B = T_{low} to T_{high} , $-40^\circ\text{C} < T_J < 125^\circ\text{C}$
C = T_{low} to T_{high} , $0^\circ\text{C} < T_J < 125^\circ\text{C}$

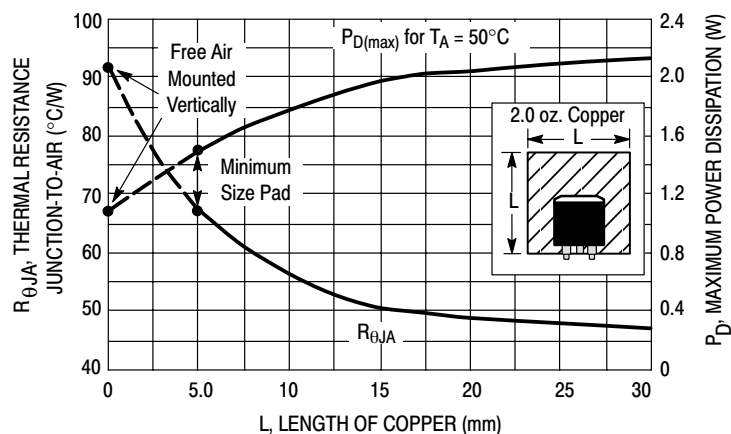


Figure 1. DPAK-3 Thermal Resistance and Maximum Power Dissipation versus P.C.B. Copper Length

MC79M00 Series

ORDERING INFORMATION

Device	Output Voltage Tolerance	Operating Temperature Range	Package	Shipping [†]
MC79M05BDT	4.0%	$T_J = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	DDPAK	75 Units / Rail
MC79M05BDTG			DDPAK (Pb-Free)	75 Units / Rail
MC79M05BDTRK			DDPAK	2500 Units / Reel
MC79M05BDTRKG			DDPAK (Pb-Free)	2500 Units / Reel
MC79M05BT			TO-220	50 Units / Rail
MC79M05BTG			TO-220 (Pb-Free)	50 Units / Rail
MC79M05CDT		$T_J = 0^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	DDPAK	75 Units / Rail
MC79M05CDTG			DDPAK (Pb-Free)	75 Units / Rail
MC79M05CDTRK			DDPAK	2500 Units / Reel
MC79M05CDTRKG			DDPAK (Pb-Free)	2500 Units / Reel
MC79M05CT			TO-220	50 Units / Rail
MC79M05CTG			TO-220 (Pb-Free)	50 Units / Rail
MC79M08BDT		$T_J = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	DDPAK	75 Units / Rail
MC79M08BDTRK			DDPAK	2500 Units / Reel
MC79M08BDTRKG			DDPAK (Pb-Free)	2500 Units / Reel
MC79M08BT			TO-220	50 Units / Rail
MC79M08BTG			TO-220 (Pb-Free)	50 Units / Rail
MC79M08CDT		$T_J = 0^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	DDPAK	75 Units / Rail
MC79M08CDTG			DDPAK (Pb-Free)	75 Units / Rail
MC79M08CDTRK			DDPAK	2500 Units / Reel
MC79M08CDTRKG			DDPAK (Pb-Free)	2500 Units / Reel
MC79M08CT			TO-220	50 Units / Rail
MC79M08CTG			TO-220 (Pb-Free)	50 Units / Rail
MC79M12BDT		$T_J = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	DDPAK	75 Units / Rail
MC79M12BDTG			DDPAK (Pb-Free)	75 Units / Rail
MC79M12BDTRK			DDPAK	2500 Units / Reel
MC79M12BDTRKG			DDPAK (Pb-Free)	2500 Units / Reel
MC79M12BT			TO-220	50 Units / Rail
MC79M12BTG			TO-220 (Pb-Free)	50 Units / Rail
MC79M12CDT		$T_J = 0^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	DDPAK	75 Units / Rail
MC79M12CDTG			DDPAK (Pb-Free)	75 Units / Rail
MC79M12CDTRK			DDPAK	2500 Units / Reel
MC79M12CDTRKG			DDPAK (Pb-Free)	2500 Units / Reel
MC79M12CT			TO-220	50 Units / Rail
MC79M12CTG			TO-220 (Pb-Free)	50 Units / Rail

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MC79M00 Series

ORDERING INFORMATION

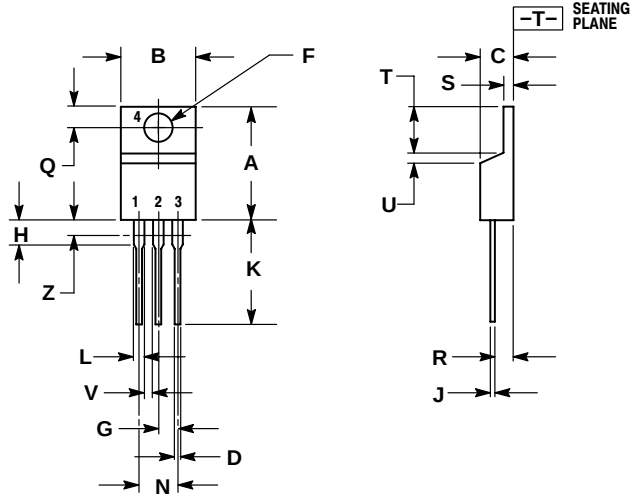
Device	Output Voltage Tolerance	Operating Temperature Range	Package	Shipping†
MC79M15BDT	4.0%	$T_J = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	DPAK	75 Units / Rail
MC79M15BDTG			DPAK (Pb-Free)	75 Units / Rail
MC79M15BDTRK			DPAK	2500 Units / Reel
MC79M15BDTRKG			DPAK (Pb-Free)	2500 Units / Reel
MC79M15BT			TO-220	50 Units / Rail
MC79M15BTG			TO-220 (Pb-Free)	50 Units / Rail
MC79M15CDT		$T_J = 0^{\circ}\text{C}$ to $+125^{\circ}\text{C}$	DPAK	75 Units / Rail
MC79M15CDTG			DPAK (Pb-Free)	75 Units / Rail
MC79M15CDTRK			DPAK	2500 Units / Reel
MC79M15CDTRKG			DPAK (Pb-Free)	2500 Units / Reel
MC79M15CT			TO-220	50 Units / Rail
MC79M15CTG			TO-220 (Pb-Free)	50 Units / Rail

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MC79M00 Series

PACKAGE DIMENSIONS

TO-220, SINGLE GAUGE
T SUFFIX
CASE 221AB-01
ISSUE O



NOTES:

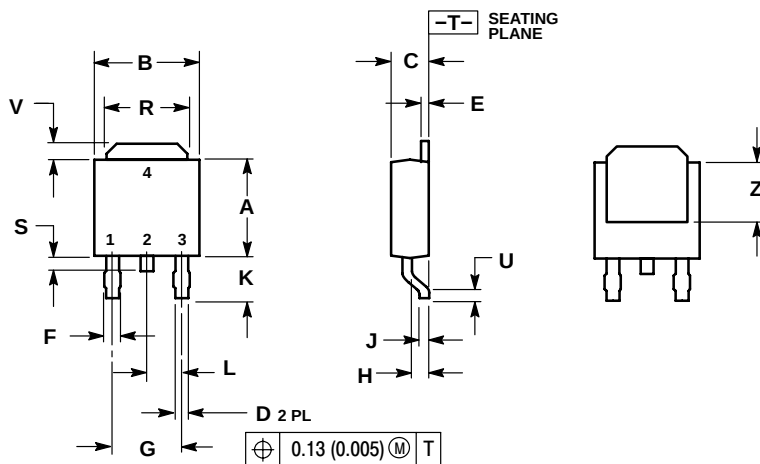
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.020	0.055	0.508	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

MC79M00 Series

PACKAGE DIMENSIONS

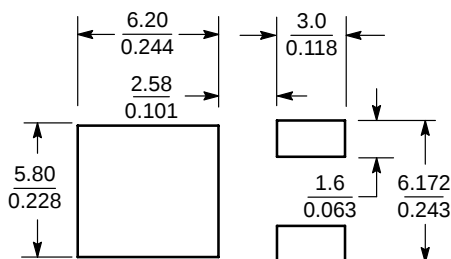
DPAK-3
DT SUFFIX
 CASE 369C-01
 ISSUE O



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.245	5.97	6.22
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.180	0.215	4.57	5.45
S	0.025	0.040	0.63	1.01
U	0.020	---	0.51	---
V	0.035	0.050	0.89	1.27
Z	0.155	---	3.93	---

SOLDERING FOOTPRINT*



SCALE 3:1 (mm/inches)

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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