

MC34268

Advance Information

SCSI-2 Active Terminator Regulator

The MC34268 is a medium current, low dropout positive voltage regulator specifically designed for use in SCSI-2 active termination circuits. This device offers the circuit designer an economical solution for precision voltage regulation, while keeping power losses to a minimum. The regulator consists of a 1.0 V dropout composite PNP/NPN pass transistor, current limiting, and thermal limiting. These devices are packaged in the 8-pin SOP-8 and 3-pin DPAK surface mount power packages.

Applications include active SCSI-2 terminators and post regulation of switching power supplies.

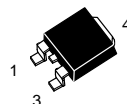
- 2.85 V Output Voltage for SCSI-2 Active Termination
- 1.0 V Dropout
- Output Current in Excess of 800 mA
- Thermal Protection
- Short Circuit Protection
- Output Trimmed to 1.4% Tolerance
- No Minimum Load Required
- Space Saving DPAK and SOP-8 Surface Mount Power Packages

SCSI-2 ACTIVE TERMINATOR REGULATOR

SEMICONDUCTOR TECHNICAL DATA

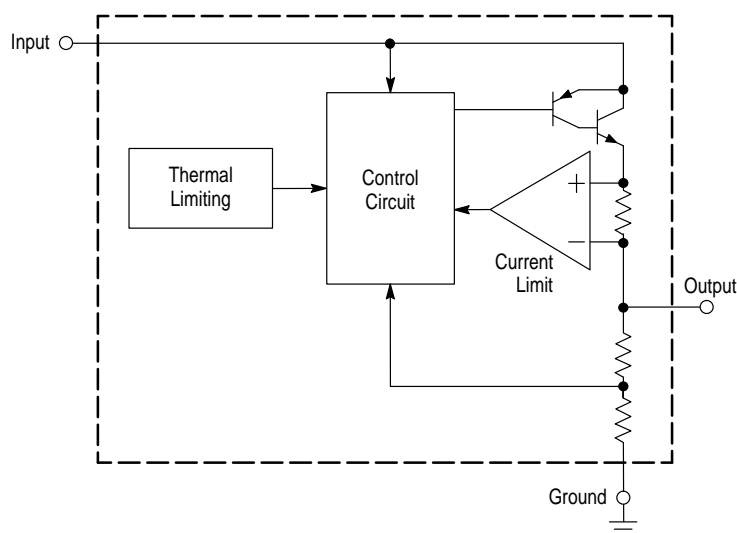


D SUFFIX
PLASTIC PACKAGE
CASE 751
(SOP-8)

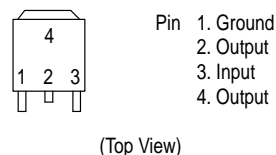
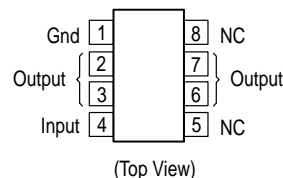


DT SUFFIX
PLASTIC PACKAGE
CASE 369A
(DPAK)

Simplified Block Diagram



PIN CONNECTIONS



ORDERING INFORMATION

Device	Operating Temperature Range	Package
MC34268D	$T_J = 0^\circ \text{ to } +125^\circ\text{C}$	SOP-8
MC34268DT		DPAK

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Power Supply Input Voltage	V_{in}	15	V
Power Dissipation and Thermal Characteristics DT Suffix, Plastic Package, Case 369A $T_A = 25^\circ\text{C}$, Derate Above $T_A = 25^\circ\text{C}$ Thermal Resistance, Junction-to-Case Thermal Resistance, Junction-to-Air D Suffix, Plastic Package, Case 751 $T_A = 25^\circ\text{C}$, Derate Above $T_A = 25^\circ\text{C}$ Thermal Resistance, Junction-to-Case Thermal Resistance, Junction-to-Air	P_D $R_{\theta JC}$ $R_{\theta JA}$ P_D $R_{\theta JC}$ $R_{\theta JA}$	Internally Limited 5.0 87 Internally Limited 22 140	W $^\circ\text{C/W}$ $^\circ\text{C/W}$ W $^\circ\text{C/W}$ $^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	0 to +150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS

($V_{in} = 4.25\text{ V}$, $C_O = 10\text{ }\mu\text{F}$, for typical values $T_J = 25^\circ\text{C}$, for min/max values $T_J = 0^\circ\text{C}$ to $+125^\circ\text{C}$, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage ($T_J = 25^\circ\text{C}$, $I_O = 0\text{ mA}$) Output Voltage, over Line, Load, and Temperature ($V_{in} = 3.9\text{ V}$ to 15 V , $I_O = 0\text{ mA}$ to 490 mA)	V_O	2.81 2.76	2.85 2.85	2.89 2.93	V
Line Regulation ($V_{in} = 4.25\text{ V}$ to 15 V , $I_O = 0\text{ mA}$, $T_J = 25^\circ\text{C}$)	Reg _{line}	—	—	0.3	%
Load Regulation ($I_O = 0\text{ mA}$ to 800 mA , $T_J = 25^\circ\text{C}$)	Reg _{load}	—	—	0.5	%
Dropout Voltage ($I_O = 490\text{ mA}$)	$V_{in} - V_O$	—	0.95	1.1	V
Ripple Rejection ($f = 120\text{ Hz}$)	RR	55	—	—	dB
Maximum Output Current ($V_{in} = 5.0\text{ V}$)	$I_{(max)}$	800	—	—	mA
Bias Current ($V_{in} = 4.25\text{ V}$, $I_O = 0\text{ mA}$)	I_B	—	5.0 to 3.0	8.0	mA
Minimum Load Current to maintain Regulation ($V_{in} = 15\text{ V}$)	$I_{L(min)}$	—	—	0	mA

Figure 1. Dropout Voltage versus Output Load Current

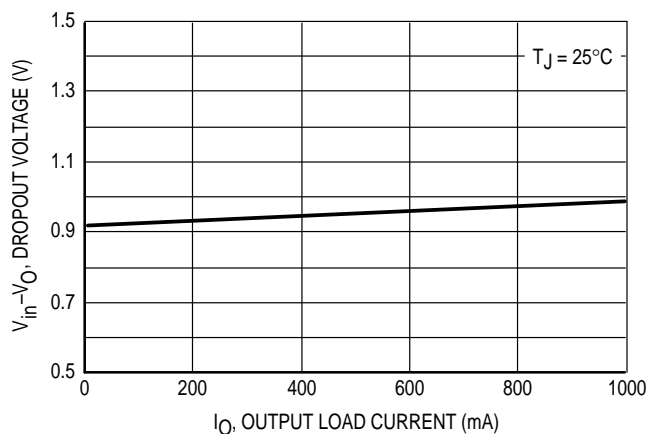


Figure 2. Transient Load Regulation

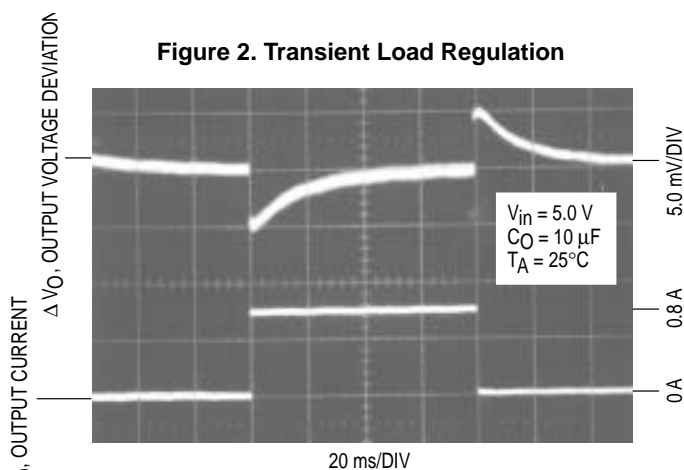


Figure 3. Typical SCSI Application

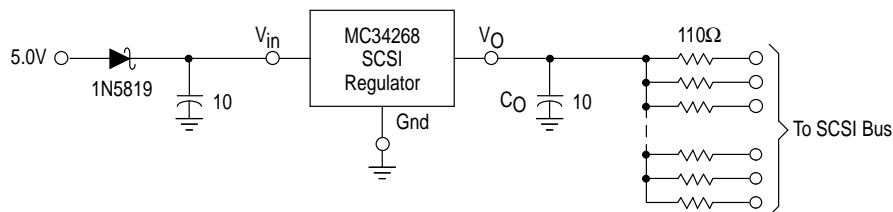


Figure 3 is a circuit of a typical SCSI terminator application. The MC34268 is designed specifically to provide 2.85 V required to drive a SCSI-2 bus. The output current capability of the regulator is in excess of 800 mA; enough to drive standard SCSI-2, fast SCSI-2, and some wide SCSI-2 applications. The typical dropout voltage is less than 1.0 V, allowing the IC to regulate to input voltages less than 4.0 V. Internal protective features include current and thermal limiting.

The MC34268 requires an external 10 µF capacitor with an ESR of less than 10 Ω for stability over temperature. With economical electrolytic capacitors, cold temperature operation can pose a stability problem. As temperature decreases, the capacitance also decreases and the ESR increases, which could cause the circuit to oscillate. Tantalum capacitors may be a better choice if small size is a requirement. Also, the capacitance and ESR of a tantalum capacitor is more stable over temperature.

Figure 4. SOP-8 Thermal Resistance versus P.C.B. Copper Length

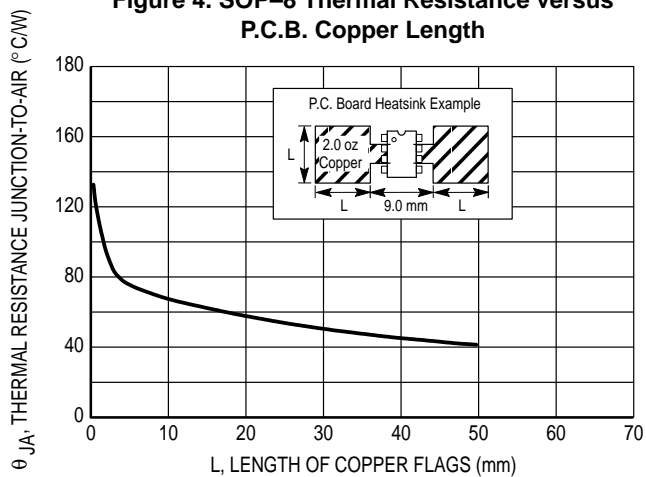
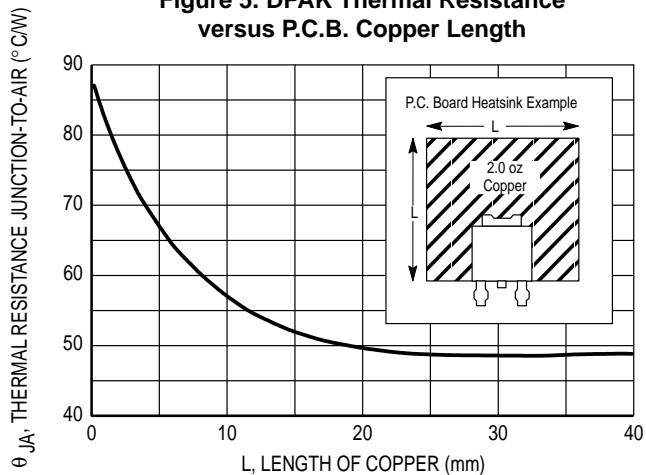
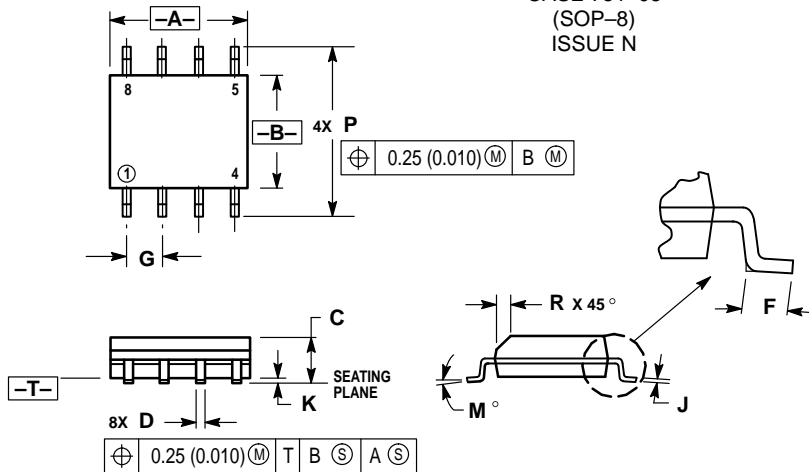


Figure 5. DPAK Thermal Resistance versus P.C.B. Copper Length



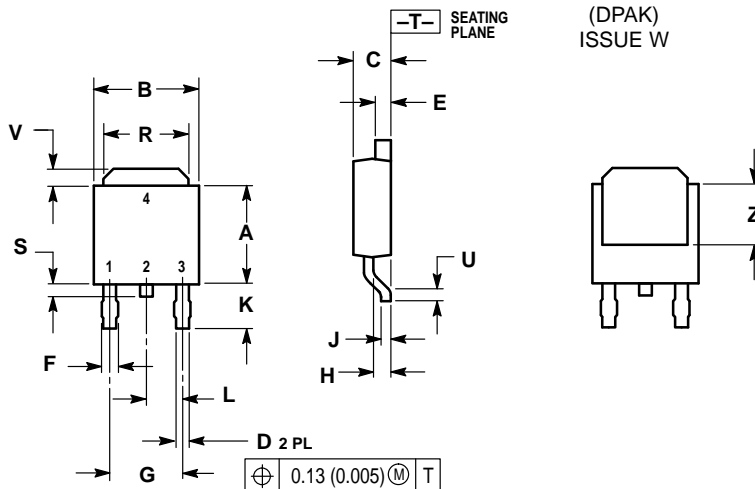
OUTLINE DIMENSIONS

D SUFFIX
 PLASTIC PACKAGE
 CASE 751-05
 (SOP-8)
 ISSUE N


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.18	0.25	0.007	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

DT SUFFIX
 PLASTIC PACKAGE
 CASE 369A-13
 (DPAK)
 ISSUE W


NOTES:

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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
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	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
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	0.175	0.215	4.45	5.46
S	0.020	0.050	0.51	1.27
U	0.020	—	0.51	—
V	0.030	0.050	0.77	1.27
Z	0.138	—	3.51	—

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