MC34268

Voltage Regulator - SCSI-2 Active Terminator, Low Dropout

800 mA, 2.85 V

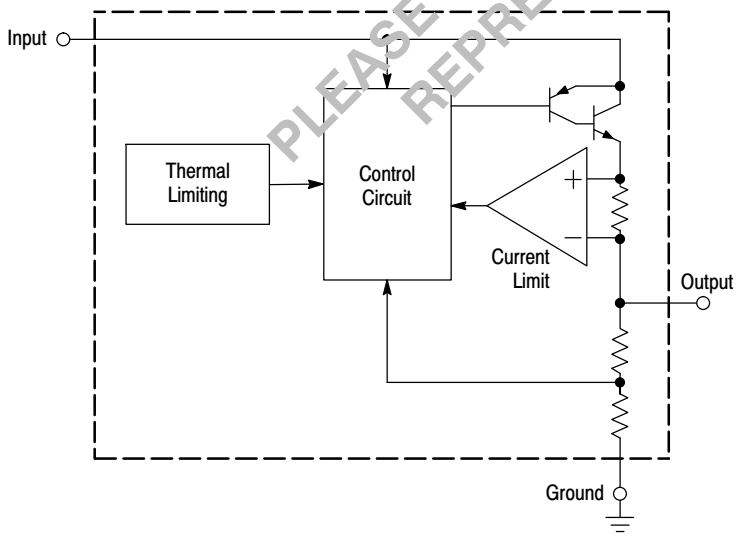
The MC34268 is a medium current, low dropout positive voltage regulator specifically designed for use in SCSI−2 active termination circuits. This device offers the circuit designer an economical solution for precision voltage regulation, while keeping power losses to a minimum. The regulator consists of a 1.0 V dropout composite PNP/NPN pass transistor, current limiting, and thermal limiting. These devices are packaged in the SOIC−8 and DPAK−3 and SOT−223 surface mount power packages.

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

Features

- 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, SOT−223 and SOIC−8 Surface Mount Power Packages
- Pb−Free Packages are Available

Simplified Block Diagram



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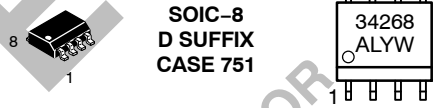
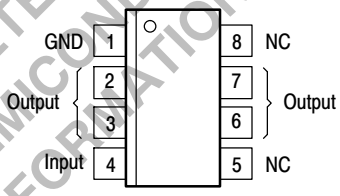
MARKING DIAGRAMS



SOIC−8
D SUFFIX
CASE 751

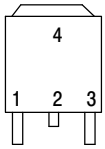
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week



(Top View)

DPAK−3
DT SUFFIX
CASE 369A

SOT−223
ST SUFFIX
CASE 318E



Pin 1. Ground
2. Output
3. Input
4. Output

(Top View)

Heatsink surface (shown as terminal 4 in case outline drawing) is connected to Pin 2.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

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°C, Derate Above T_A = 25°C	P_D	Internally Limited	W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	5.0	°C/W
Thermal Resistance, Junction−to−Air	$R_{\theta JA}$	87	°C/W
D Suffix, Plastic Package, Case 751			
T_A = 25°C, Derate Above T_A = 25°C	P_D	Internally Limited	W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	22	°C/W
Thermal Resistance, Junction−to−Air	$R_{\theta JA}$	140	°C/W
ST Suffix, Plastic Package, Case 318E			
T_A = 25°C, Derate Above T_A = 25°C	P_D	Internally Limited	W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	15	°C/W
Thermal Resistance, Junction−to−Air	$R_{\theta JA}$	245	°C/W
Operating Ambient Temperature Range	T_A	0 to +125	°C
Maximum Die Junction Temperature	T_J	+150	°C
Storage Temperature	T_{stg}	− 55 to +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

ELECTRICAL CHARACTERISTICS

(V_{in} = 4.25 V, C_O = 10 μF, for typical values T_A = 25°C, for min/max values T_A = 0°C to +125°C, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Output Voltage (T_A = 25°C, I_O = 0 mA) Output Voltage, over Line, Load, and Temperature (V_{in} = 4.5 V to 15 V, I_O = 0 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 V to 15 V, I_O = 0 mA, T_A = 25°C)	Reg_{line}	–	–	0.3	%
Load Regulation (I_O = 0 mA to 800 mA, T_A = 25°C)	Reg_{load}	–	–	0.5	%
Dropout Voltage (I_O = 490 mA)	$V_{in} - V_O$	–	0.95	1.1	V
Ripple Rejection (f = 120 Hz)	RR	55	–	–	dB
Maximum Output Current (V_{in} = 4.25 V)	$I_{(max)}$	800	–	–	mA
Bias Current (V_{in} = 4.25 V, I_O = 0 mA)	I_B	–	5.0 to 3.0	8.0	mA
Minimum Load Current to Maintain Regulation (V_{in} = 15 V)	$I_{L(min)}$	–	–	0	mA

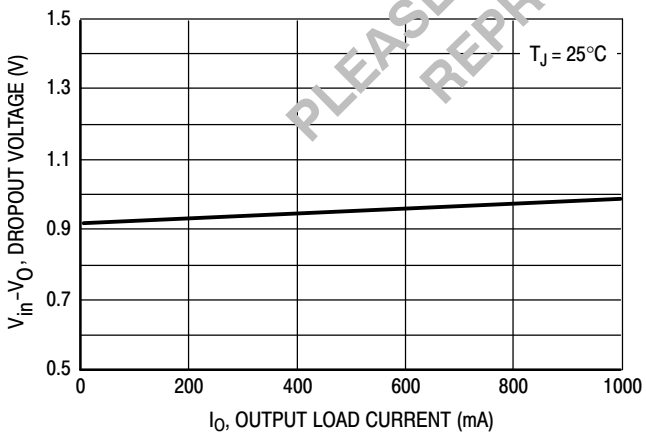


Figure 1. Dropout Voltage versus Output Load Current

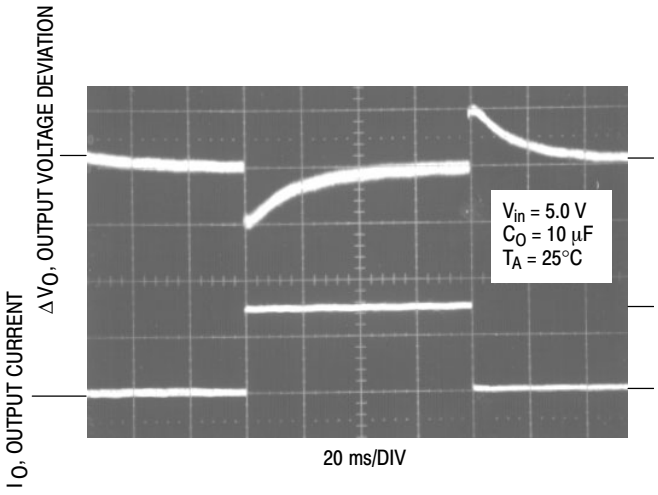


Figure 2. Transient Load Regulation

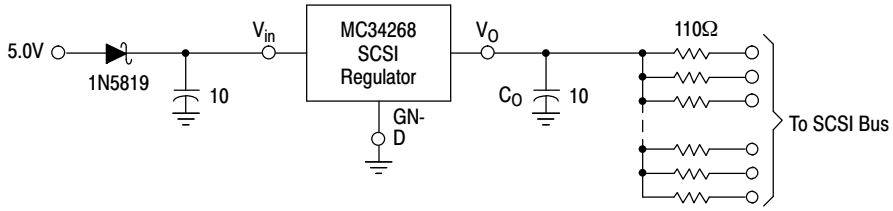


Figure 3. Typical SCSI Application

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. The capacitance and ESR of a tantalum capacitor is more stable over temperature.

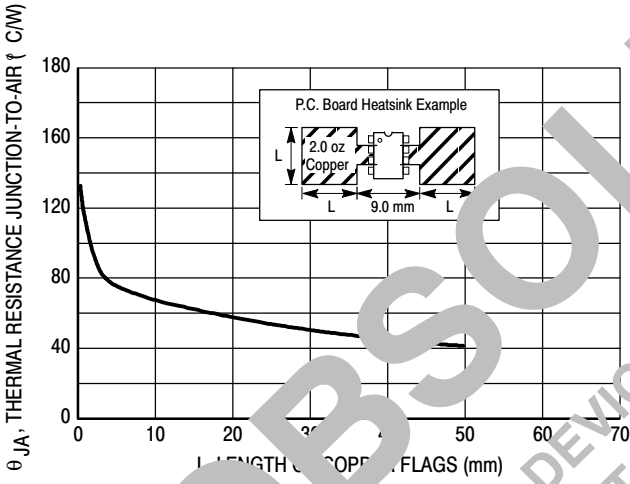


Figure 4. SOIC−8 Thermal Resistance versus P.C.B. Copper Length

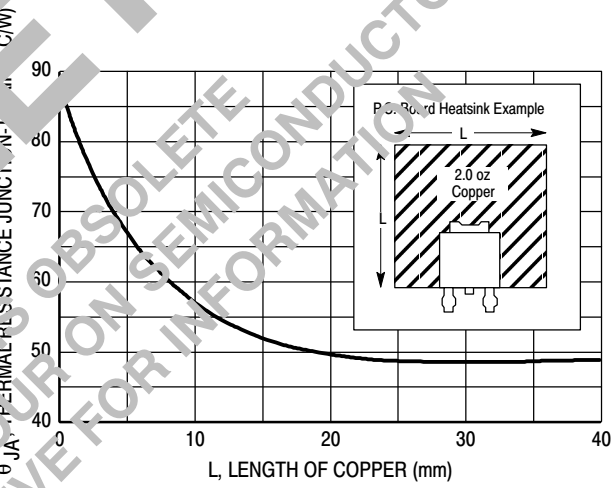


Figure 5. DPAK−3 Thermal Resistance versus P.C.B. Copper Length

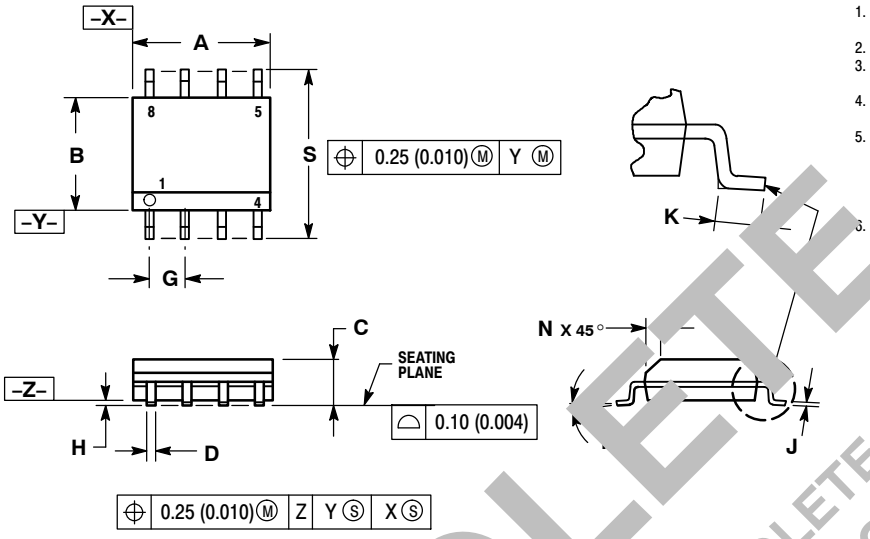
ORDERING INFORMATION

Device	Package	Shipping Information†
MC34268D	SOIC−8	98 Units / Rail
MC34268DG	SOIC−8 (Pb−Free)	98 Units / Rail
MC34268DR2	SOIC−8	2500 Units / Tape & Reel
MC34268DR2G	SOIC−8 (Pb−Free)	2500 Units / Tape & Reel
MC34268DT	DPAK−3	75 Units / Rail
MC34268DTG	DPAK−3 (Pb−Free)	75 Units / Rail
MC34268DTRK	DPAK−3	2500 Units / Tape & Reel
MC34268DTRKG	DPAK−3 (Pb−Free)	2500 Units / Tape & Reel
MC34268STT3	SOT−223	4000 Units / Tape & Reel

†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.

PACKAGE DIMENSIONS

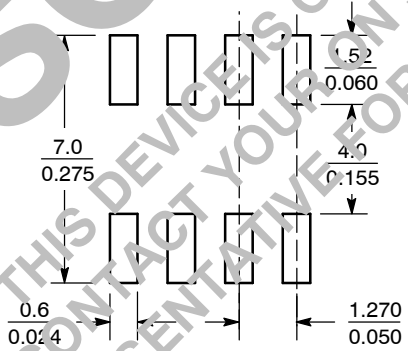
SOIC−8
D SUFFIX
CASE 751−07
ISSUE AB



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION 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.
6. 751−01 THRU 751−06 ARE OBSOLETE. NEW STANDARD IS 751−07.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

SOLDERING FOOTPRINT*



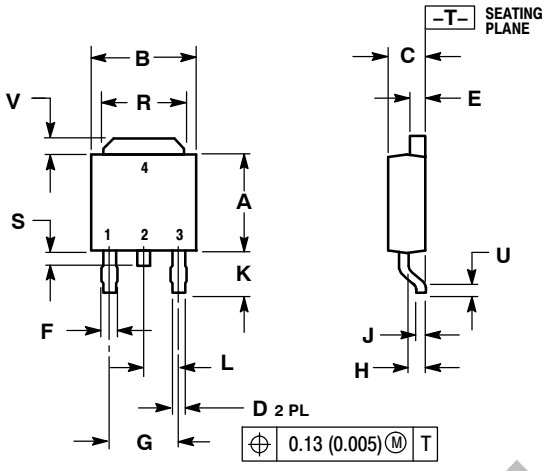
SCALE 6:1 $\left(\frac{mm}{inches}\right)$

SOIC−8

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

PACKAGE DIMENSIONS

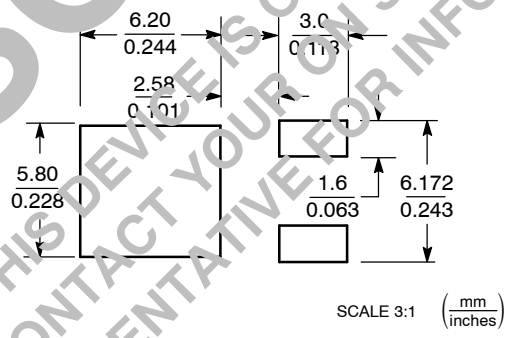
DPAK−3
DT SUFFIX
CASE 369A−13
ISSUE AB



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

	INCHES		MILLIMETERS	
DIM	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	---

SOLDERING FOOTPRINT*



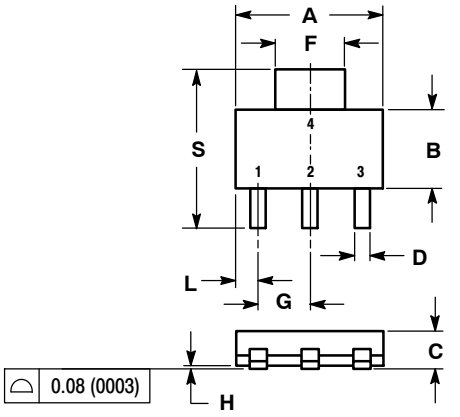
SCALE 3:1 $\left(\frac{mm}{inches}\right)$

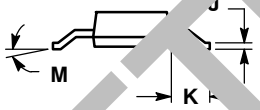
DPAK−3

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

PACKAGE DIMENSIONS

SOT−223
ST SUFFIX
CASE 318E−04
ISSUE K

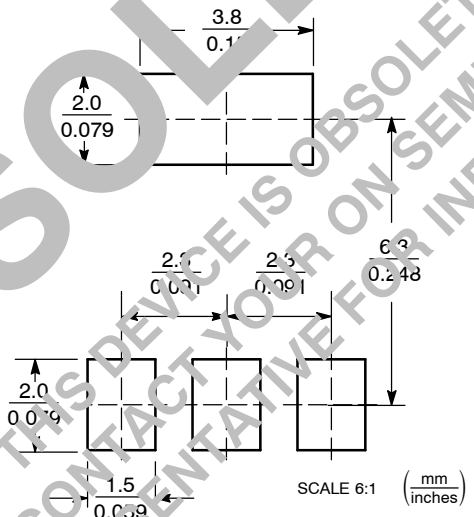




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.249	0.263	6.30	6.70
B	0.130	0.145	3.30	3.70
C	0.060	0.068	1.50	1.75
D	0.024	0.035	0.60	0.89
F	0.115	0.126	2.90	3.20
G	0.087	0.094	2.20	2.40
H	0.0008	0.0040	0.020	0.100
J	0.009	0.014	0.24	0.35
K	0.060	0.078	1.50	2.00
L	0.033	0.041	0.85	1.05
M	0 °	10 °	0 °	10 °
S	0.264	0.287	6.70	7.30

SOLDERING FOOTPRINT*



SOT−23

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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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