DESCRIPTION:

The MP54C/MP55C series of power modules are low noise (no EMI), economical 25W (nominal) linear DC:DC converters with an integral connector conforming to Intel Corporation's Voltage Regulator Module specification for the Pentium® Processor.

Outstanding features include internal current limiting and thermal shutdown, providing full device protection against load faults and thermal overstress. The MP54C series is designed to supply power for the Pentium Processor P54C & P54CS and associated chip sets. With a tightly controlled output voltage, nominally 3.525V, the MP54C meets all requirements for powering VRE specification processors.

The MP54C-5E is a reduced cost version offering a maximum current of 5A. For P55C processors, please see Semtech's datasheet, MP55C.

FEATURES:

- Integral VRM header connector
- Input voltage 5V ± 5%
- Fixed output voltage 3.525V for all Pentium® Processor variants (VRE or standard voltage)
- Steady state output current 5.8A/7.5A peak (MP54C-E) or 5A (MP54C-5E)
- Low dropout voltage
- Fast transient response
- Low noise, no EMI
- Fully qualified by Intel Corporation for Intel Pentium® Processor P54C & P54CS 90 - 200MHz module

APPLICATIONS:

- Intel Pentium® Power Supply

ORDERING INFORMATION:

DEVICE	Max Current (A)	Output Voltage (V)
MP54C-E	7.5A	3.525
MP54C-5E	5.0A	3.525

ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Output Voltage[1]	V_O	3.400	3.525	3.600	V
Output Current (MP54C-E)	I_O	0.01	5.8	7.5	A
Output Current (MP54C-5E)	I_O	0.01		5.0	A
Line Regulation[1]	$REG_{(LINE)}$		0.015	0.2	%
Load Regulation[1]	$REG_{(LOAD)}$		0.1	0.4	%
Dropout Voltage	V_D		1.1	1.2	V
Current Surge Limit (MP54C-E)	I_S		9.5		A
Current Surge Limit (MP54C-5E)	I_S		7.5		A
Quiescent Current	I_Q		12	16	mA
Temperature Coefficient	T_C		0.005		%/°C
Temperature Stability	T_S		0.5		%
RMS Output Noise[2]	V_N		0.003		$\%V_O$
Ripple Rejection Ratio	R_A		72		dB
Linear Airflow Requirements (ambient temperature 55°C)		0.5 100			m/s ft/min

NOTES:

(1) Low duty cycle pulse testing with Kelvin connections required.
(2) Bandwidth of 10 Hz to 10 kHz.

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INPUT AND OUTPUT CONNECTIONS

Pin No.	Row A	Row B	Pin No.
1	V_{SS}	V_{SS}	1
2	V_{SS}	V_{SS}	2
3	ND	$V_{I/O}$	3
4	$V_{I/O}$	$V_{I/O}$	4
5	+3.3V	+3.3V	5
6	+3.3V	+3.3V	6
7	V_{CORE}	V_{CORE}	7
8	V_{CORE}	V_{CORE}	8
9	V_{SS}	V_{CORE}	9
10	V_{CORE}	V_{CORE}	10
11	PWR GOOD	UPVRM#	11
12	SENSE	DISABLE	12
13	V_{SS}	V_{SS}	13
14	+5.0V	+5.0V	14
15	+5.0V	+5.0V	15

A   B

15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

**VRM
PCB**
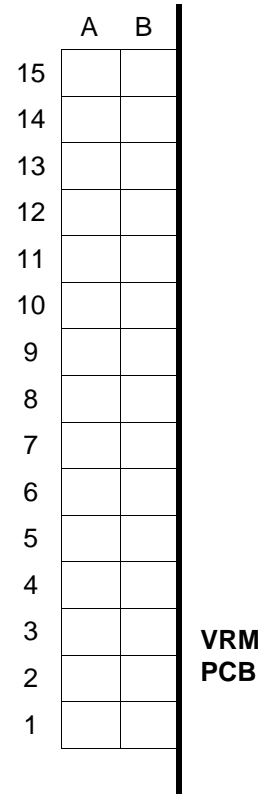
End view of VRM connector
(viewed from motherboard side)

VOLTAGE REGULATOR MODULE CONNECTOR PIN REFERENCE

Pin Name	I/O	Function	Notes
+3.3V	Input	+3.3V Supply	Not connected
+5.0V	Input	+5.0V Supply	Input
V_{CORE}	Output	Voltage Regulator Module Output	Output
$V_{I/O}$	Output	CPU I/O power connection. Allows for split voltage plane for I/O circuitry.	Tied to output
V_{SS}	Input	Ground Reference	Ground
DISABLE	Input	When driven high, this input will disable the Voltage Regulator Module output and the output of the module will float.	Not connected
PWR GOOD	Output	Power Good is driven low when the VRM output is not within valid levels.	Not connected
SENSE	Input	Sense is provided for the regulator to correct for voltage drops across the connector and motherboard powerplane.	Not connected
UPVRM#	Input	This signal indicates to future upgrade processors that the proper module is installed. This signal must be tied HIGH for this module.	Tied to output.
ND		This pin may be used as a +12V supply input, otherwise it should be left as a no connect (NC)	Not connected

Note: The functions of DISABLE, SENSE, PWR_GOOD & UPVRM# are optional features specified by Intel. These are not included in the standard Voltage Regulator Module.

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MECHANICAL DIMENSIONS
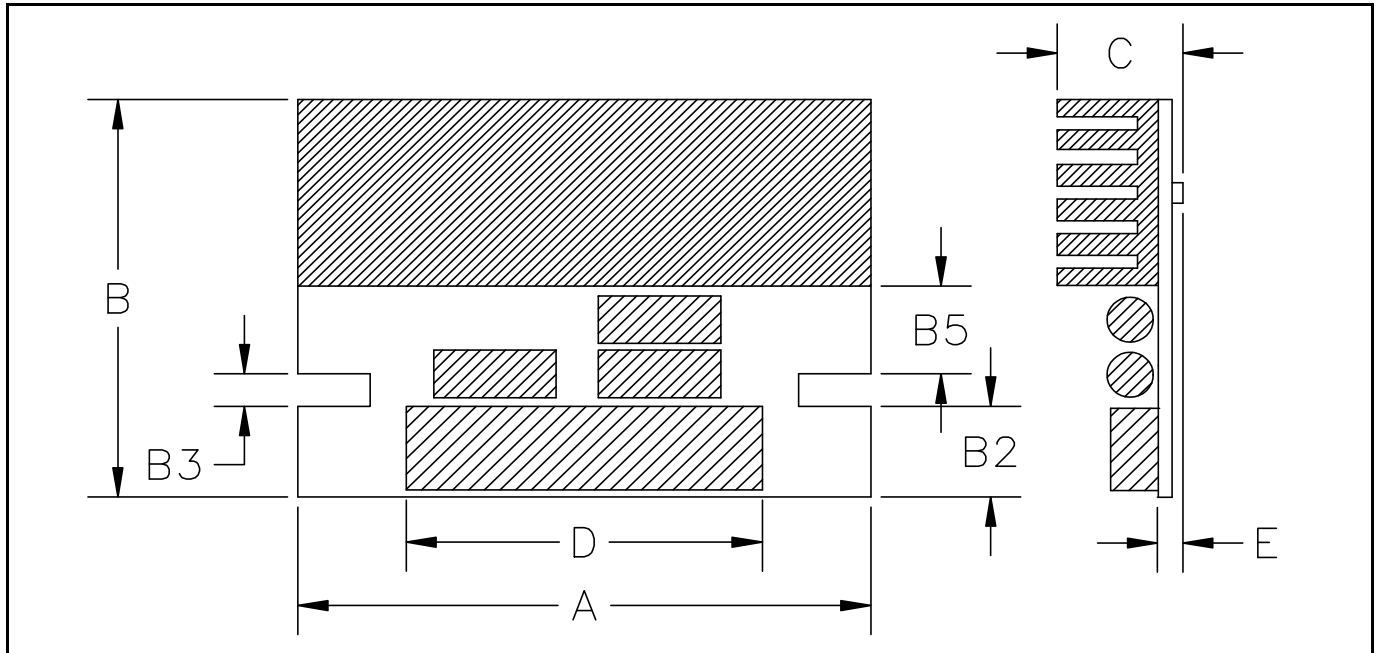
Dimension	Inches	Millimeters
A	2.575	65.4
B	1.8	45.7
C	0.8	20.3
D	1.6	40.6
E	0.24	6.1
B_2	0.42	10.7
B_3	0.15	3.8
B_5	0.5	12.7

Component size and location for illustration only