Chipsmall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

FEATURES

- 5-phase dual output PWM Controller

- Phases are flexibly assigned between Loops 1 & 2

- Intel® VR12, AMD® 400kHz & 3.4MHz SVI and Memory modes

- Dual OCP support for I-spike enhanced AMD CPUs

- SMB_Alert Pin for Servers

- PMBus Address pin or Variable Gate Drive (IR3541/CHL8325A)

- 2nd Temperature Sense for VR12 Desktop (CHL8325B)

- Overclocking & Gaming Mode with Vmax setting

- Switching frequency from 200kHz to 1.2MHz per phase

- IR Efficiency Shaping Features including Variable Gate Drive (IR3541/CHL8325A only) and Dynamic Phase Control

- Programmable 1-phase or 2-phase for Light Loads and Active Diode Emulation for Very Light Loads

- IR Adaptive Transient Algorithm (ATA) on both loops minimizes output bulk capacitors and system cost

- Auto-Phase Detection with auto-compensation

- Per-Loop Fault Protection: OVP, UVP, OCP, OTP, CFP

- I2C/SMBus/PMBus system interface for telemetry of Temperature, Voltage, Current & Power for both loops

- Non-Volatile Memory (NVM) for custom configuration

- Compatible with IR ATL and 3.3V Tri-state Drivers

- +3.3V supply voltage; -20ºC to 85ºC ambient operation

- Pb-Free, RoHS, 6x6 40-pin QFN, MSL2 package

APPLICATIONS

- Intel ® VR12 & AMD® SVI based systems

- DDR Memory with Vtt tracking

- Overclocked & Gaming platforms

DESCRIPTION

The IR3541 and CHL8325A/B are dual-loop digital multi-phase buck controllers that drive up to 5 phases. The IR3541 and CHL8325A/B are fully Intel® VR12 and AMD® SVI compliant on both loops and provides a Vtt tracking function for DDR memory.

NVM storage saves pins and enables a small package size.

The IR3541 and CHL8325A/B include the IR Efficiency Shaping Technology to deliver exceptional efficiency at minimum cost across the entire load range. IR Variable Gate Drive optimizes the MOSFET gate drive voltage as a function of real-time load current. IR Dynamic Phase Control adds/drops active phases based upon load current. The IR3541 and CHL8325A/B can be configured to enter 1-phase operation and active diode emulation mode automatically or by command.

IR's unique Adaptive Transient Algorithm (ATA), based on proprietary non-linear digital PWM algorithms, minimizes output bulk capacitors.

The I2C/PMBus interface can communicate with up to 16 IR3541 and CHL8325A/B based VR loops. Device configuration and fault parameters are easily defined using the IR Intuitive Power Designer (DPDC) GUI and stored in on-chip NVM.

The IR3541 and CHL8325A/B also include numerous features like register diagnostics for fast design cycles and platform differentiation, truly simplifying VRD design and enabling fastest time-to-market with its "set-and-forget" methodology.
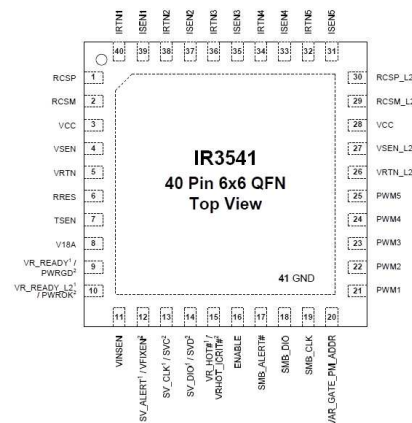
PIN DIAGRAM

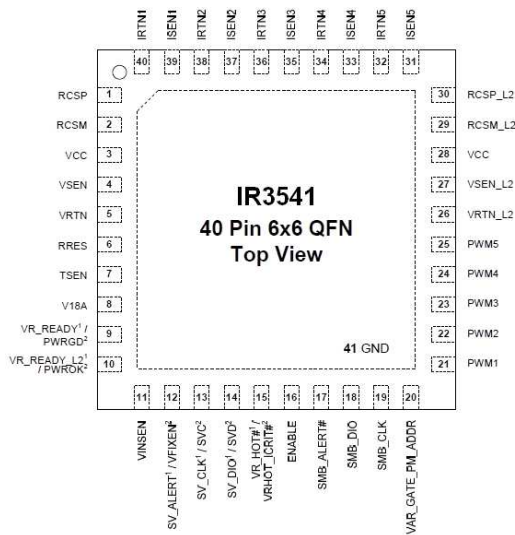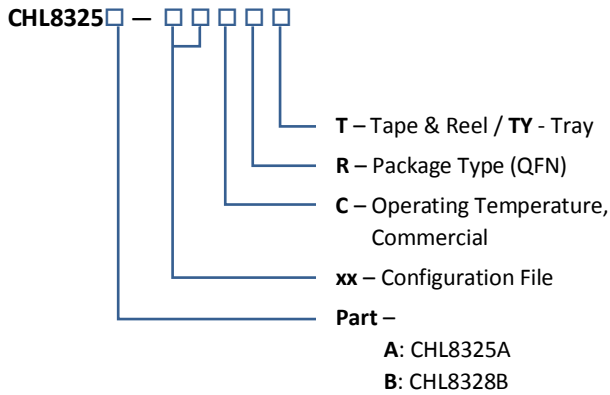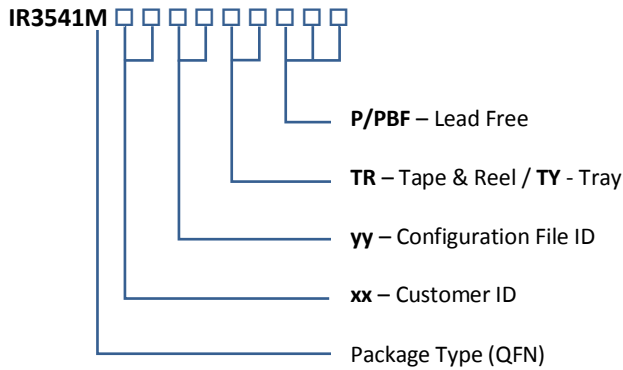**Figure 1: IR3541 Package Top View**

ORDERING INFORMATION

IR3541M ☐☐☐☐☐☐☐

- **P/PBF** – Lead Free
- **TR** – Tape & Reel / **TY** - Tray
- **yy** – Configuration File ID
- **xx** – Customer ID
- Package Type (QFN)

Package	Packing Qty	Part Number	Programming
QFN	TR=3000 TY=4900	**IR3541MTRPBF** **IR3541MTYPBF**	Default
QFN	TR=3000	**IR3541MxxyyTRP**[1]	Customer Configuration

Notes:

1. Customer Specific Configuration File, where xx = Customer ID and yy = Configuration File (Codes assigned by IR Marketing).

CHL8325☐ — ☐☐☐☐☐

- **T** – Tape & Reel / **TY** - Tray
- **R** – Package Type (QFN)
- **C** – Operating Temperature, Commercial
- **xx** – Configuration File
- **Part** –
  - **A**: CHL8325A
  - **B**: CHL8328B

Package	Packing Qty	Part Number
QFN	T=3000 TY=4900	**CHL8325A-00CRT** **CHL8325A-00CRTY**
QFN	T=3000	**CHL8325A-xxCRT**[1]
QFN	T=3000 TY=4900	**CHL8325B-00CRT** **CHL8325B-00CRTY**
QFN	T=3000	**CHL8325B-xxCRT**[1]

Notes:

1. "xx" indicates a customer specific configuration file.

Figure 2: IR3541 Package Top View, Enlarged
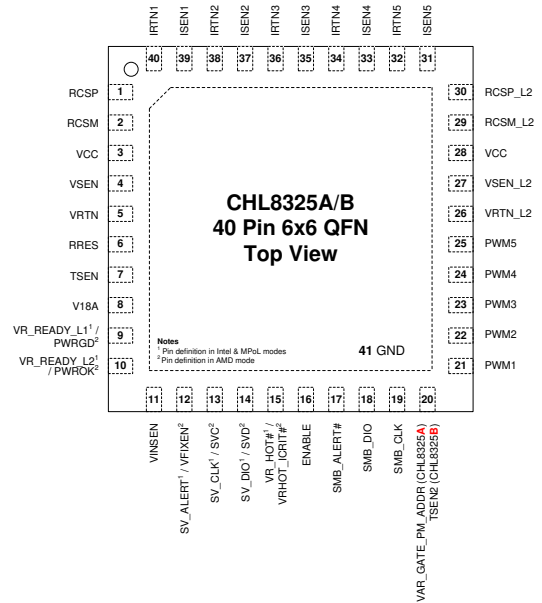
Figure 3: CHL8325A/B Package Top View, Enlarged

FUNCTIONAL BLOCK DIAGRAM

V18A VCC

LDO

1.8V

RCSP_L2
RSCM_L2
VSEN_L2
VRTN_L2

AFE_2

VID_2

ITOT_2

Voltage ADC

RCSP
RSCM
VSEN
VRTN

AFE_1

VID_1

ISEN1
IRTN1   IP1

ISEN2
IRTN2   IP2   Σ   ITOT_1

ISEN3
IRTN3   IP3

ISEN4
IRTN4   IP4

ISEN5
IRTN5   IP5   Σ   ITOT_2   Current ADC

IP1
IP2
IP3
IP4
IP5

TSEN2
(CHL8325B)

TSEN

VINSEN

V3_3   Monitor ADC

Control and Monitoring

Vout1_Error
Vout2_Error

Mode Control

Phase_Period_1
Phase_Period_2

PWM Generator

PWM1
PWM2
PWM3
PWM4
PWM5

VAR_GATE_PM_ADDR
(IR3541 & CHL8325A)

Iout
Vin
Vout
Temp
Fault Bus
System Clock

Reference, Oscillator, State Control, Interfaces, Registers and NVM

System Clock
ADC Clocks
MUX Clocks
Phase_Period_1
Phase_Period_2
VID_1
VID_2
Iout
Vin
Temp
Fault Bus

SMB_DIO
SMB_CLK
SV_CLK[1]/SVC[2]
SV_DIO[1]/SVD[2]
EN

SMB_ALERT#
SV_ALERT#[1]/VFIXEN[2]
VR_HOT#[1]/VRHOT_ICRIT#[2]
VR_READY_L1[1]/PWRGD[2]
VR_READY_L2[1]/PWROK[2]

RRES

Notes
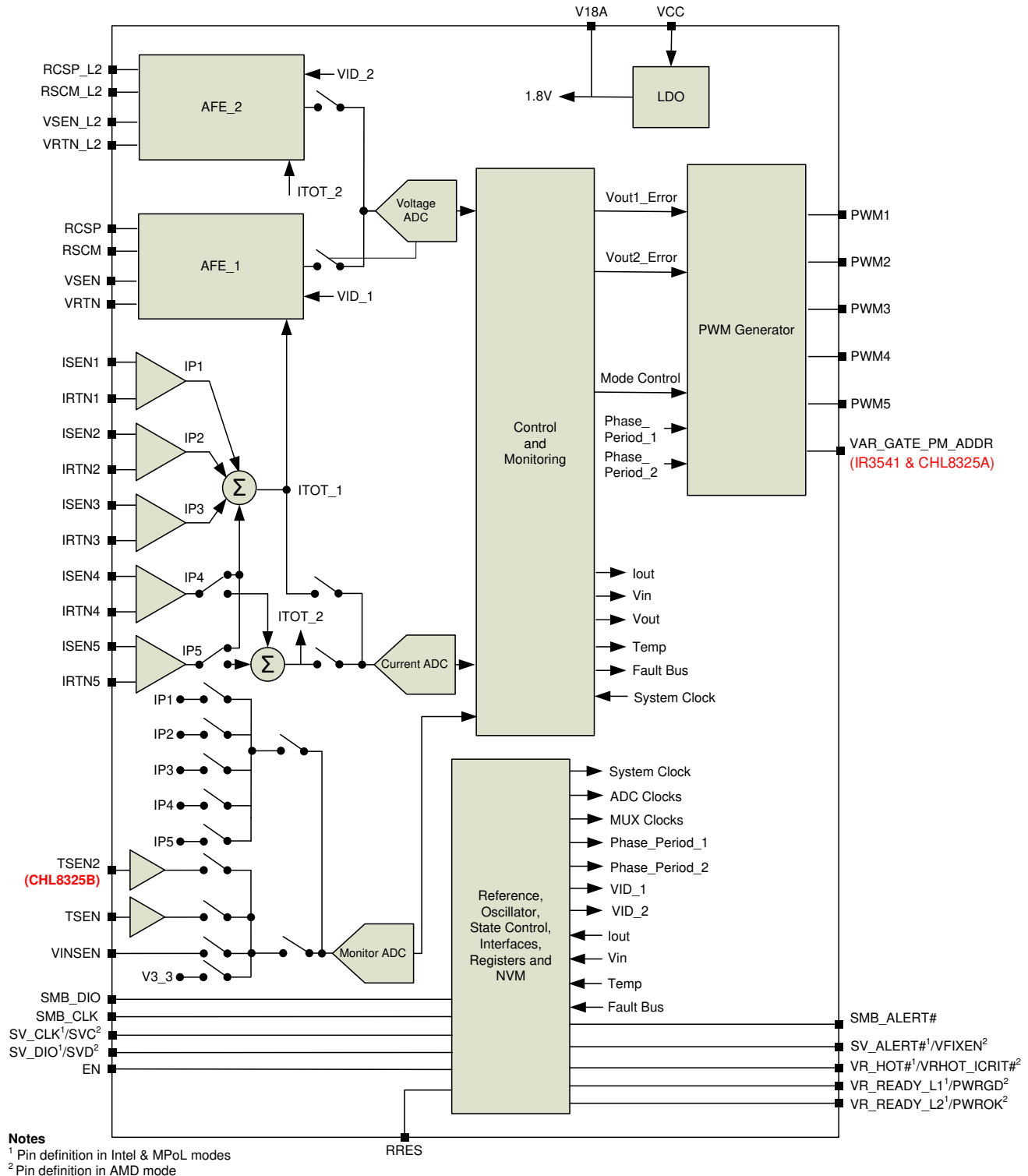[1] Pin definition in Intel & MPoL modes
[2] Pin definition in AMD mode

Figure 4: IR3541 and CHL8325A/B Functional Block Diagram