

TDM22545T OptiMOS™

Dual Phase 140A Power Stage Module with Integrated TLVR Inductor

Features

- Integrated dual converters including two smart power stages, two TLVR inductors, and decoupling capacitors
- Infineon's latest smart power stages utilize OptiMOS™-6 MOSFETs
- Output DC current capability of 80 A per phase (Thermally managed)
- Output peak current capability of 120 A per phase
- Input voltage (VIN) range of 4.25 V to 16 V
- On-chip MOSFET Current sensing and reporting at 5 μ A/A
- 8mV / °C temperature analog output
- VCC supply of 4.25 V to 5.5 V
- Output voltage range from 0.225 V up to 2 V at VIN = 12 V
- Operation up to 2 MHz
- VCC under voltage lockout (UVLO)
- Bootstrap under-voltage protection
- Auto-replenishment on bootstrap capacitors
- Over temperature protection and thermal shutdown
- Cycle-by-cycle over current Protection (OCP) and flag
- Control MOSFET short (HSS) detection and flag
- Compatible with 3.3 V tri-state PWM Input
- Body-Braking™ load transient support
- DEEP SLEEP mode for power saving via EN= low (32 μ A typ per phase)
- Lead free RoHS compliant package
- Small LGA package in 10 mm (length) x 9 mm (width) x 4.8 mm (height)

Potential Applications

- Artificial Intelligence accelerators chips
- CPU Power
- GPU Power
- FPGA Power
- Telcom/datacenter

Product validation

Qualified for industrial applications according to JESD47 and IPC9701

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Description

- High frequency, compact DC-DC converters
- Voltage Regulators for CPUs, GPUs, FPGAs and DDR memory arrays
- Server, communication and artificial intelligence systems

The TDM22545T dual OptiMOS™ TLVR Power Module co-packages two smart power stages and two TLVR power inductors to implement two independent synchronous buck converters into a small 10mm x 9mm x 4.8mm package. The package is optimized for PCB layout, heat transfer, driver/MOSFET control timing, and minimal switch node ringing. The smart power stage pairs optimized gate drivers and MOSFETs to enable higher efficiency at lower output voltages required by cutting edge CPU, GPU, FPGA and DDR memory designs. The TLVR inductor reduces the size of the onboard decoupling capacitors that normally occupy a considerable area on the motherboards and provides much faster transient response during large load current transitions.

The improved MOSFET current-mirror current-output sensing achieves superior current sense accuracy versus best-in-class controller-based Inductor DCR sense as well as MOSFET $R_{ds(on)}$ current sense methods.

Protections include IC temperature reporting and over temperature protection feature (OTP with thermal shutdown), cycle-by-cycle over current protection (OCP), control MOSFET short detection (HSS - High side short detection), and VCC under-voltage protection. The OptiMOS™ Power Module power stage also features "refreshing" of bootstrap capacitor to prevent the bootstrap capacitor from over-discharging.

Inductors are optimized for switching frequencies between 600 kHz to 1.2 MHz, which enables high performance transient response while maintaining industry leading efficiency.

TDM22545T OptiMOS™**Dual Phase 140A Power Stage Module with Integrated TLVR Inductor****1 Ordering Information****Table 1 Product Identification**

Part Number	Temp Range	Package	Orderable Part Number
TDM22545T	-40 to 125°C	LG-MLGA-72-8 10 mm x 9 mm x 4.8 mm	TBD

TDM22545T OptiMOS™

Dual Phase 140A Power Stage Module with Integrated TLVR Inductor

2 Storage, Handling and Environmental Qualification Information

Table 2 Storage and Handling Information

Parameter	Specification	Notes
Storage Temperature Range	-40 to 150°C	–
Pad Finish	ENIG	3uM to 5uM Nickel, 0.15uM to 0.2uM Gold
Weight	1.57g	–

Table 3 Environmental Qualifications Information

Parameter	Specification	Notes
Qualification Level	Industrial	–
Moisture Sensitivity Level (MSL) Rating	JEDEC Level 3 @ 260 °C	9x10x5mm LG-MLGA-72-8 Package
ESD Rating		
[HBM] Human Body Model	ANSI/ESDA/JEDEC JS-001, Class 2 (2000V to <4000V)	–
[CDM] Charged Device Model	ANSI/ESDA/JEDEC JS-002, Class C3 (≥ 1000)	–
RoHS Compliant	Yes	–

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3 Package Information

3.1 Product Marking Information

For internal reference only: POD - Rev. 2.

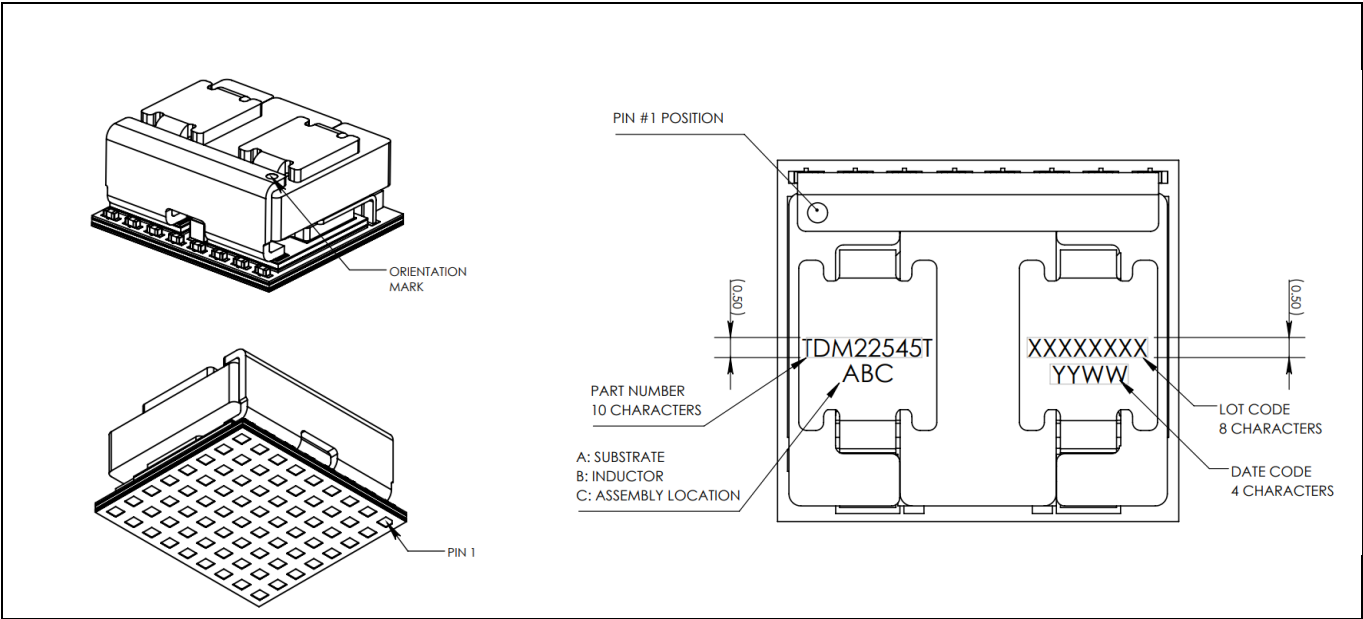


Figure 1 Product Marking Information

TDM22545T OptiMOS™
Dual Phase 140A Power Stage Module with Integrated TLVR Inductor

3.2 Package Dimensions

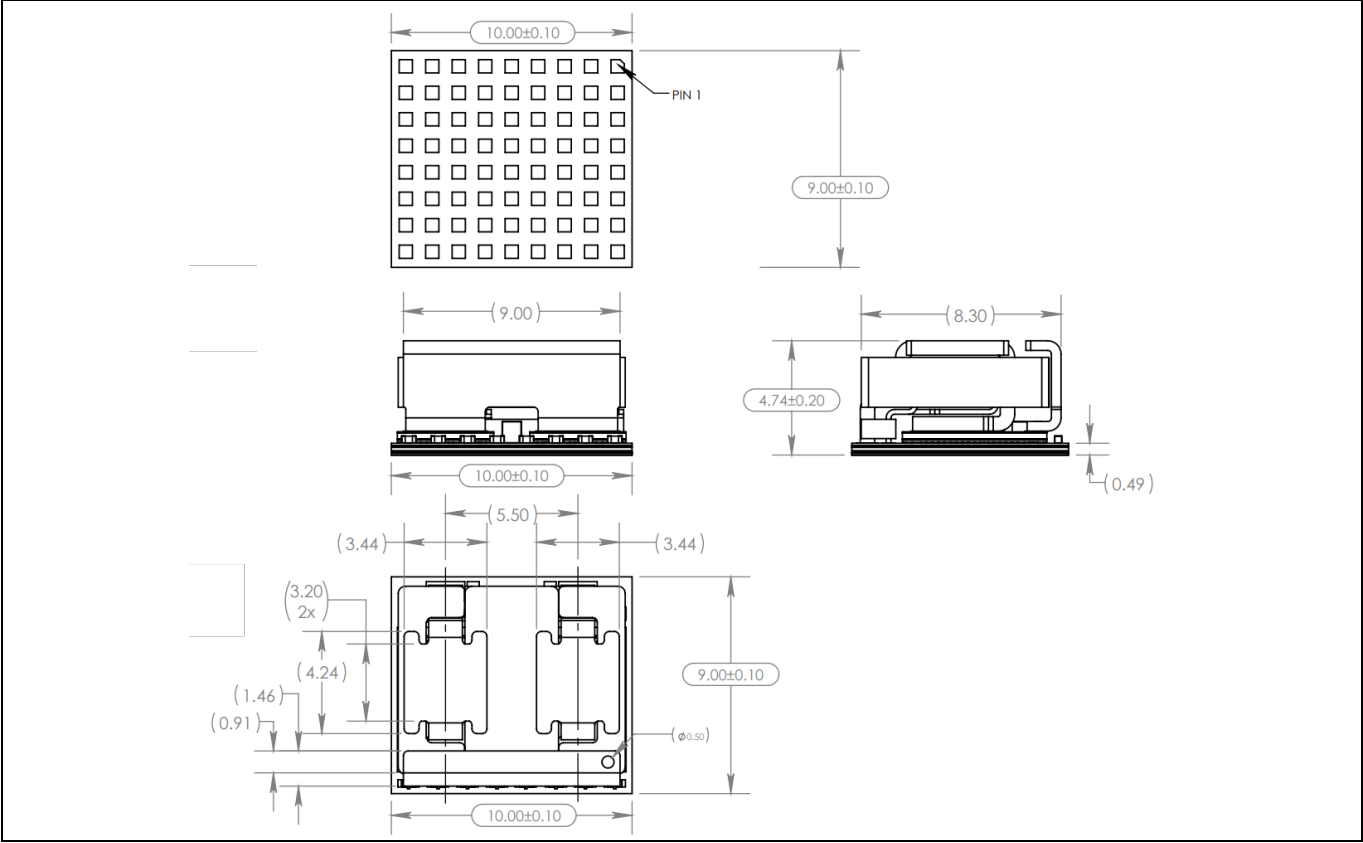


Figure 2 Package Dimensions (all dimensions in mm)

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Document reference

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