

## **IGBT/MOSFET Gate Drive Optocoupler for Air Conditioner**

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### **ABSTRACT**

Liteon offered the best solution what IGBT/MOSFET Gate Drive Optocoupler for Home Appliance Air Conditioner applications. Liteon have High CMR, 2.5A/3.0A Output peak current, Rail-to-Rail Output voltage, etc components.

The **LTV-3120** contains a GaAIAs LED optically coupled to an integrated circuit with a power output stage. It is ideally suited for driving power IGBTs and MOSFETs used in Motor Control, Inverters, SMPS, Induction Heating (Cooking), Home Appliance (such as Refrigerator, Washing Machines and Air Conditioner) and Industrial Applications.

The 2.5A peak output current is capable of directly driving most IGBTs and MOSFETs with ratings of up to 1,200V/100A. For IGBTs and MOSFETs with higher ratings, the LTV-3120 can be used to drive a discrete power stage which drives the IGBT or MOSFET gate.

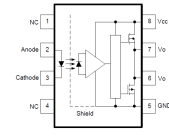
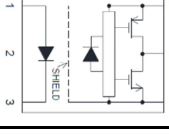
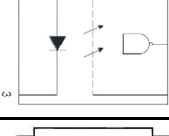
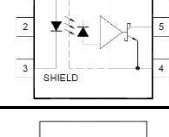
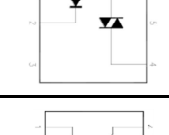
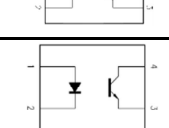
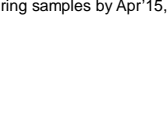
The LTV-3120 has an operating temperature of -40°C to 100°C, this makes it ideal for use in applications that operate in industrial environments.

The **LTV-341** series Optocoupler is ideally suited for driving power IGBTs and MOSFETs used in motor control inverter applications and inverters in power supply system. It contains a AlGaAs LED optically coupled to an integrated circuit with a power output stage. The 1.0A peak output current is capable of directly driving most IGBTs with ratings up to 1200V/100A. For IGBTs with higher ratings, the LTV-341 series can be used to drive a discrete power stage which drives the IGBT gate.

The LTV-341P and LTV-341W have the highest insulation voltage of  $V_{IORM} = 891 V_{Peak}$  and  $V_{IORM} = 1140 V_{Peak}$  respectively.

Anywise, Liteon have more best solutions what these are High Speed Coupler(**LTV-M601**), IPM Gate Drive Interface Optocoupler(**LTV-456**), PhotoTriac(**MOC30xx** · **LTV-30xx**) and General Purpose Photocoupler(**LTV-817** · **LTV-217**) for Home Appliance.

## Selection Guide

Device	Package	Functional Diagram	Features
<b>LTV-3120</b>	DIP-8		<ul style="list-style-type: none"> <li>✓ High CMR 25KV/μs @V<sub>CM</sub>=1500(V)</li> <li>✓ V<sub>CC</sub> = 15~30(V) wide operating range</li> <li>✓ 2.5A Output peak current</li> </ul>
<b>LTV-341 series</b>	LSOP6		<ul style="list-style-type: none"> <li>✓ Rail-to-Rail Output voltage</li> <li>✓ Under Voltage Lock-Out protection</li> <li>✓ 3.0A Output peak current</li> </ul>
<b>LTV-M601</b>	SOP5		<ul style="list-style-type: none"> <li>✓ 3.3V/5V Dual Supply Voltages</li> <li>✓ Low Power Consumption</li> <li>✓ High Speed 10MBd</li> </ul>
<b>LTV-456</b>	LSOP6		<ul style="list-style-type: none"> <li>✓ High CTR</li> <li>✓ High CMTI</li> <li>✓ Minimized PWD</li> </ul>
<b>MOC30xx</b> <b>LTV-30xx</b>	DIP6 SOP4		<ul style="list-style-type: none"> <li>✓ High Isolation Voltage</li> <li>✓ Mini-Flat Package</li> <li>✓ Rohs compliant</li> </ul>
<b>LTV-817</b>	DIP4 DIP4 SMD		<ul style="list-style-type: none"> <li>✓ High Isolation Voltage</li> <li>✓ Rohs compliant</li> </ul>
<b>LTV-217</b>	SSOP4		<ul style="list-style-type: none"> <li>✓ High Isolation Voltage</li> <li>✓ Rohs compliant</li> </ul>

Notes: LTV-3120 (M.P. now) and LTV-341 (engineering samples by Apr'15, M.P. schedule by Aug'15). LTV-456 (engineering samples by Q2'15, M.P. schedule by Q3'15)

## Air Conditioner Applications and Topologies

Designing for consumer applications require reliable Photocoupler products that offer more functionality and higher isolation while minimizing power consumption and costs. Liteon have the product technologies and manufacturing capabilities, to help you differentiate your products in the market.

A typical air conditioner system consists of an Outdoor unit, an Indoor unit and a Power Supply unit. For the Power supply unit, Liteon has high isolation voltage Photocoupler that is mains used to isolate the PWM and PFC. For Indoor unit, MCU control the FAN Module combined with our Photocoupler, Heater switch combined with our PhotoTriac and peripheral device. The main isolate both MCU and related peripheral devices, to ensure the reliability of the circuit. For Outdoor unit, to use the MCU control Motor system for FAN and Compressor. Motor control systems are an integral part of various home appliances. These developments are dictated by safety and environment protection requirements, by performance requirements, and of course by the manufacturing cost. So, when we were designing home appliances, the need to strengthen attention the MCU and peripheral device to the application circuit isolation to ensure lower noise of the circuit.

Explore product information and see block diagram below.



**Fig. 1** Air Conditioner of on the market

Block Diagram

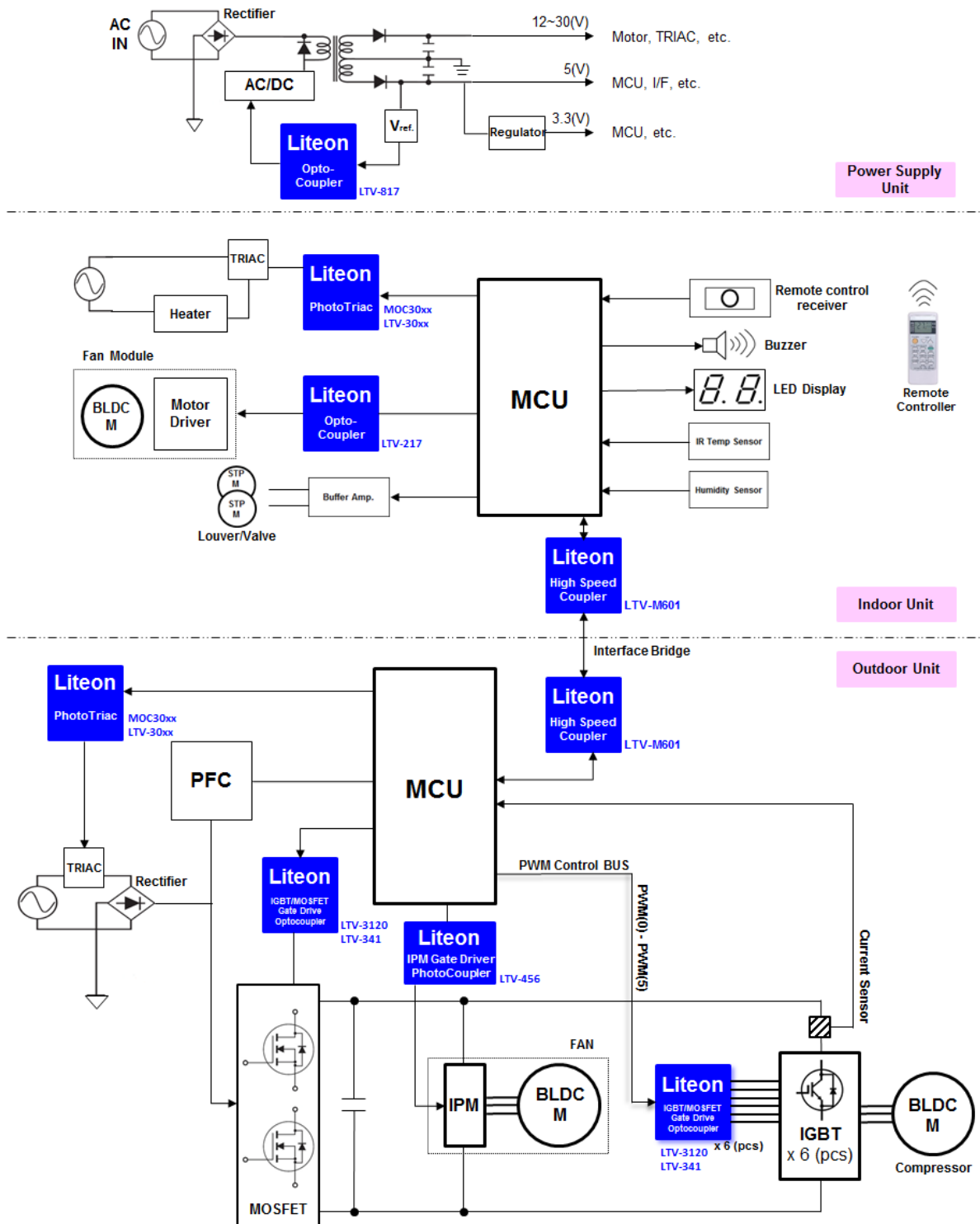


Fig. 2 Block Diagram of Air Conditioner

Liteon's LTV-3120 and LTV-341 IGBT/MOSFET gate drive optocoupler are used for motor control of Air Conditioner, microcontrollers for IGBTs timing control. These are best choice for bridge of motor control system.

The increasing use of air conditioner in domestic usage is driving the demand for reduced power consumption and smaller compressor units, to maintaining a comfortable room temperature. Air Conditioner's critical design factors and challenges for motor control architectures are efficiency, reliability, noise reduction, thermal performance, reduced board space and ease of design. The design engineers face significant challenges such as component spend, complex algorithm development, and numerous design cycles during implementation. Liteon constantly expanding product portfolio, combined with manufacturing process enhancements, innovative topologies, and our systems expertise, allow circuit designers to develop the most advanced solutions to meet your needs. We offer a broad range of IGBT Gate Driver Optocoupler, IPM Gate Drive Interface Optocoupler, High Speed Coupler, PhotoTriac and General Purpose Photocoupler for every motor control application.

Liteon Technology offered the IGBT/MOSFET gate drive optocoupler that can match different IGBTs/MOSFETs for Air Conditioner applications. Optimized for Air Conditioner, these IGBTs/MOSFETs gate drive optocoupler contain High CMR, High Output peak current, Rail-to-Rail Output Voltage that are able to attain a balance between switching and conduction losses. In addition, Liteon's solutions notably lead the market with best-performance ratio, as we ensure system efficiency and minimize total losses.

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