LAMPIRAN

International
IOR Rectifier

Data Sheet No. PD60028-M

IR2111(S)& (PbF)

HALF-BRIDGE DRIVER

Features

- Floating channel designed for bootstrap operation
  Fully operational to +600V
  Tolerant to negative transient voltage
  dV/dt immune
- Gate drive supply range from 10 to 20V
- Undervoltage lockout for both channels
- CMOS Schmitt-triggered inputs with pull-down
- Matched propagation delay for both channels
- Internally set deadtime
- High side output in phase with input
- Also available LEAD-FREE

Product Summary

V_{OFFSET}	600V max.
I_O+/-	200 mA / 420 mA
V_{OUT}	10 - 20V
$t_{on/off}$ (typ.)	750 & 150 ns
Deadtime (typ.)	650 ns

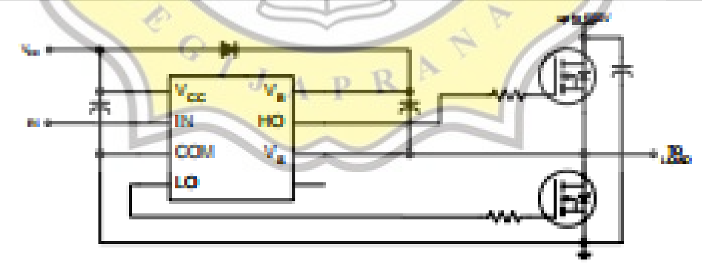
Description

The IR2111(S) is a high voltage, high speed power MOSFET and IGBT driver with dependent high and low side referenced output channels designed for half-bridge applications. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. Logic input is compatible with standard CMOS outputs. The output drivers feature a high pulse current buffer stage designed for minimum driver cross-conduction. Internal deadtime is provided to avoid shoot-through in the output half-bridge. The floating channel can be used to drive an N-channel power MOSFET or IGBT in the high side configuration which operates up to 600 volts.

Packages

8-Lead PDIP 8-Lead SOIC

Typical Connection



(Refer to Lead Assignments for correct pin configuration). This/These diagram(s) show electrical connections only. Please refer to our Application Notes and DesignTips for proper circuit board layout.

www.irf.com 1

TOSHIBA Photocoupler GaAℓAs Ired & Photo−IC

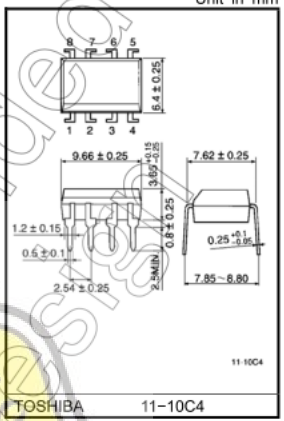
TLP250

Transistor Inverter
Inverter For Air Conditioner
IGBT Gate Drive
Power MOS FET Gate Drive

The TOSHIBA TLP250 consists of a GaAlAs light emitting diode and a integrated photodetector.
This unit is 8−lead DIP package.
TLP250 is suitable for gate driving circuit of IGBT or power MOS FET.

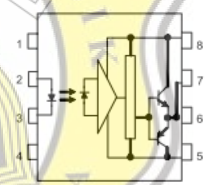
- Input threshold current: I_F=5mA(max.)
- Supply current (I_{CC}): 11mA(max.)
- Supply voltage (V_{CC}): 10−35V
- Output current (I_O): ±1.5A (max.)
- Switching time (t_{pLH}/t_{pHL}): 0.5μs(max.)
- Isolation voltage: 2500V_{rms}(min.)
- UL recognized: UL1577, file No.E67349
- Option(D4)
  VDE Approved : DIN EN60747-5-2
  Maximum Operating Insulation Voltage : 890V_{PK}
  Highest Permissible Over Voltage : 4000V_{PK}
  (Note):When a EN60747-5-2 approved type is needed, Please designate "Option(D4)"

Unit in mm



Weight: 0.54 g (typ.)

Pin Configuration (top view)

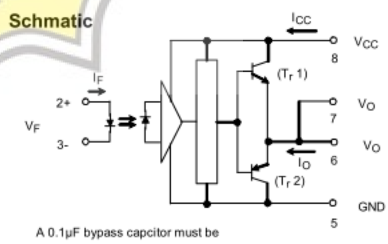


1 : N.C.
2 : Anode
3 : Cathode
4 : N.C.
5 : GND
6 : V_O (Output)
7 : V_O
8 : V_{CC}

Truth Table

		Tr1	Tr2
Input LED	On	On	Off
	Off	Off	On

Schmatic



A 0.1μF bypass capcitor must be connected between pin 8 and 5 (See Note 5).

Technische Information / Technical Information

IGBT-Module
IGBT-modules

FF300R12KS4

62mm C-Serien Modul mit schnellem IGBT2 für hochfrequentes Schalten
62mm C-series module with the fast IGBT2 for high-frequency switching

IGBT,Wechselrichter / IGBT,Inverter

Höchstzulässige Werte / Maximum Rated Values

Kollektor-Emitter-Sperrspannung Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200	V
Kollektor-Dauergleichstrom Continuous DC collector current	T_C = 80°C, $T_{vj\,max}$ = 150°C T_C = 25°C, $T_{vj\,max}$ = 150°C	$I_{C\,nom}$ I_C	300 370	A A
Periodischer Kollektor-Spitzenstrom Repetitive peak collector current	t_P = 1 ms	I_{CRM}	600	A
Gesamt-Verlustleistung Total power dissipation	T_C = 25°C, $T_{vj\,max}$ = 150	P_{tot}	1950	W
Gate-Emitter-Spitzenspannung Gate-emitter peak voltage		V_{GES}	+/-20	V

Charakteristische Werte / Characteristic Values

				min.	typ.	max.	
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage	I_C = 300 A, V_{GE} = 15 V I_C = 300 A, V_{GE} = 15 V	T_{vj} = 25°C T_{vj} = 125°C	$V_{CE\,sat}$		3,20 3,85	3,75	V V
Gate-Schwellenspannung Gate threshold voltage	I_C = 12,0 mA, V_{CE} = V_{GE}, T_{vj} = 25°C		V_{GEth}	4,5	5,5	6,5	V
Gateladung Gate charge	V_{GE} = -15 V ... +15 V		Q_G		3,20		µC
Interner Gatewiderstand Internal gate resistor	T_{vj} = 25°C		R_{Gint}		1,0		Ω
Eingangskapazität Input capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V		C_{ies}		20,0		nF
Rückwirkungskapazität Reverse transfer capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V		C_{res}		1,40		nF
Kollektor-Emitter-Reststrom Collector-emitter cut-off current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			5,0	mA
Gate-Emitter-Reststrom Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			400	nA
Einschaltverzögerungszeit, induktive Last Turn-on delay time, inductive load	I_C = 300 A, V_{CE} = 600 V V_{GE} = ±15 V R_{Gon} = 3,0 Ω	T_{vj} = 25°C T_{vj} = 125°C	$t_{d\,on}$		0,10 0,11		µs µs
Anstiegszeit, induktive Last Rise time, inductive load	I_C = 300 A, V_{CE} = 600 V V_{GE} = ±15 V R_{Gon} = 3,0 Ω	T_{vj} = 25°C T_{vj} = 125°C	t_r		0,06 0,07		µs µs
Abschaltverzögerungszeit, induktive Last Turn-off delay time, inductive load	I_C = 300 A, V_{CE} = 600 V V_{GE} = ±15 V R_{Goff} = 3,0 Ω	T_{vj} = 25°C T_{vj} = 125°C	$t_{d\,off}$		0,53 0,55		µs µs
Fallzeit, induktive Last Fall time, inductive load	I_C = 300 A, V_{CE} = 600 V V_{GE} = ±15 V R_{Goff} = 3,0 Ω	T_{vj} = 25°C T_{vj} = 125°C	t_f		0,03 0,04		µs µs
Einschaltverlustenergie pro Puls Turn-on energy loss per pulse	I_C = 300 A, V_{CE} = 600 V, L_S = 60 nH V_{GE} = ±15 V, di/dt = 5000 A/µs R_{Gon} = 3,0 Ω	T_{vj} = 25°C T_{vj} = 125°C	E_{on}		25,0		mJ mJ
Abschaltverlustenergie pro Puls Turn-off energy loss per pulse	I_C = 300 A, V_{CE} = 600 V, L_S = 60 nH V_{GE} = ±15 V, du/dt = 7500 V/µs R_{Goff} = 3,0 Ω	T_{vj} = 25°C T_{vj} = 125°C	E_{off}		15,0		mJ mJ
Kurzschlußverhalten SC data	V_{GE} ≤ 15 V, V_{CC} = 900 V V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	t_P ≤ 10 µs, T_{vj} = 125°C	I_{SC}		2000		A
Wärmewiderstand, Chip bis Gehäuse Thermal resistance, junction to case	pro IGBT / per IGBT		R_{thJC}			0,064	K/W
Wärmewiderstand, Gehäuse bis Kühlkörper Thermal resistance, case to heatsink	pro IGBT / per IGBT λ_{Paste} = 1 W/(m·K) / λ_{grease} = 1 W/(m·K)		R_{thCH}		0,03		K/W
Temperatur im Schaltbetrieb Temperature under switching conditions			$T_{vj\,op}$	-40		125	°C

prepared by: MK	date of publication: 2013-10-03
approved by: WR	revision: 3.2

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MICROCHIP **PIC18F2455/2550/4455/4550**

28/40/44-Pin High-Performance, Enhanced Flash USB Microcontrollers with nanoWatt Technology

Universal Serial Bus Features:

- USB V2.0 Compliant SIE
- Low-speed (1.5 Mb/s) and full-speed (12 Mb/s)
- Supports control, interrupt, isochronous and bulk transfers
- Supports up to 32 endpoints (16 bidirectional)
- 1-Kbyte dual access RAM for USB
- On-board USB transceiver with on-chip voltage regulator
- Interface for off-chip USB transceiver
- Streaming Parallel Port (SPP) for USB streaming transfers (40/44-pin devices only)

Power Managed Modes:

- Run: CPU on, peripherals on
- Idle: CPU off, peripherals on
- Sleep: CPU off, peripherals off
- Idle mode currents down to 5.8 µA typical
- Sleep current down to 0.1 µA typical
- Timer1 oscillator: 1.1 µA typical, 32 kHz, 2V
- Watchdog Timer: 2.1 µA typical
- Two-Speed Oscillator Start-up

Flexible Oscillator Structure:

- Five Crystal modes, including High-Precision PLL for USB
- Two External RC modes, up to 4 MHz
- Two External Clock modes, up to 40 MHz
- Internal oscillator block:
  - 8 user selectable frequencies, from 31 kHz to 8 MHz
  - User tunable to compensate for frequency drift
- Secondary oscillator using Timer1 @ 32 kHz
- Fail-Safe Clock Monitor
  - Allows for safe shutdown if any clock stops

Peripheral Highlights:

- High current sink/source: 25 mA/25 mA
- Three external interrupts
- Four Timer modules (Timer0 to Timer3)
- Up to 2 Capture/Compare/PWM (CCP) modules:
  - Capture is 16-bit, max. resolution 6.25 ns ($T_{CY}/16$)
  - Compare is 16-bit, max. resolution 100 ns (T_{CY})
  - PWM output: PWM resolution is 1 to 10-bit
- Enhanced Capture/Compare/PWM (ECCP) module:
  - Multiple output modes
  - Selectable polarity
  - Programmable dead-time
  - Auto-Shutdown and Auto-Restart
- Addressable USART module:
  - LIN bus support
- Master Synchronous Serial Port (MSSP) module supporting 3-wire SPI™ (all 4 modes) and I²C™ Master and Slave modes
- 10-bit, up to 13-channels Analog-to-Digital Converter module (A/D) with programmable acquisition time
- Dual analog comparators with input multiplexing

Special Microcontroller Features:

- C compiler optimized architecture with optional extended instruction set
- 100,000 erase/write cycle Enhanced Flash program memory typical
- 1,000,000 erase/write cycle data EEPROM memory typical
- Flash/data EEPROM retention: > 40 years
- Self-programmable under software control
- Priority levels for interrupts
- 8 x 8 Single Cycle Hardware Multiplier
- Extended Watchdog Timer (WDT):
  - Programmable period from 41 ms to 131s
- Programmable Code Protection
- Single-supply 5V In-Circuit Serial Programming™ (ICSP™) via two pins
- In-Circuit Debug (ICD) via two pins
- Wide operating voltage range (2.0V to 5.5V)

Device	Program Memory		Data Memory		I/O	10-bit A/D (ch)	CCP/ ECCP (PWM)	SPP	MSSP		EAUSART	Comparators	Timers 8/16-bit
	FLASH (bytes)	# Single-Word Instructions	SRAM (bytes)	EEPROM (bytes)					SPI	Master I²C			
PIC18F2455	24K	12288	2048	256	24	10	2/0	No	Y	Y	1	2	1/3
PIC18F2550	32K	16384	2048	256	24	10	2/0	No	Y	Y	1	2	1/3
PIC18F4455	24K	12288	2048	256	35	13	1/1	Yes	Y	Y	1	2	1/3
PIC18F4550	32K	16384	2048	256	35	13	1/1	Yes	Y	Y	1	2	1/3

1W, Fixed input voltage, isolated & unregulated single output

Continuous Short Circuit Protection

c UL us CE Patent Protection RoHS

FEATURES

- Continuous short-circuit protection
- Operating temperature range: -40℃ to +105℃
- Conversion efficiency high up to 80%
- Miniature SIP/DIP package, International standard pin-out
- Isolation voltage: 1.5K VDC
- EN60950,UL60950 Approval

B_S-1WR2 & B_D-1WR2 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for:

1. *Where the voltage of the input power supply is stable (voltage variation: ±10%Vin);*
2. *Where isolation between input and output is necessary (isolation voltage ≤1500VDC);*
3. *Where the output voltage regulation and the ripple & noise of the output voltage is not strictly required;*
4. *Typical application: digit circuit condition; normal low-frequency artificial circuit condition; relay drive circuit and data switching circuit condition, etc.*

Selection Guide

Certification	Part No.	Input Voltage (VDC) Nominal (Range)	Output Voltage (VDC)	Output Current (mA)(Max./Min.)	Efficiency (%Min./Typ.) @Full Load	Max. Capacitive Load(µF)
--	B0303S-1WR2	3.3 (2.97-3.63)	3.3	303/30	68/72	220
UL/CE	B0305S-1WR2		5	200/20	72/76	
	B0312S-1WR2		12	84/9	76/80	
--	B0303D-1WR2		3.3	303/30	68/72	
	B0305D-1WR2		5	200/20	72/76	
UL/CE	B0503S-1WR2	5 (4.5-5.5)	3.3	303/30	68/72	
	B0505S-1WR2		5	200/20	76/80	
	B0509S-1WR2		9	111/12	76/80	
	B0512S-1WR2		12	84/9	76/80	
	B0515S-1WR2		15	67/7	76/80	
	B0524S-1WR2		24	42/4	76/80	
--	B0503D-1WR2		3.3	303/30	68/72	
UL/CE	B0505D-1WR2		5	200/20	76/80	
	B0509D-1WR2		9	111/12	76/80	
	B0512D-1WR2		12	84/9	76/80	
	B0515D-1WR2		15	67/7	76/80	
	B0524D-1WR2		24	42/4	76/80	
--	B1203S-1WR2	12 (10.8-13.2)	3.3	303/30	68/72	
UL/CE	B1205S-1WR2		5	200/20	76/80	
	B1209S-1WR2		9	111/12	76/80	
	B1212S-1WR2		12	84/9	76/80	
	B1215S-1WR2		15	67/7	76/80	
	B1224S-1WR2		24	42/4	76/80	
--	B1203D-1WR2		3.3	303/30	68/72	
UL/CE	B1205D-1WR2		5	200/20	76/80	
	B1209D-1WR2		9	111/12	76/80	
	B1212D-1WR2		12	84/9	76/80	
	B1215D-1WR2		15	67/7	76/80	

PLAGIARISM CHECK.ORG

2.52% PLAGIARISM APPROXIMATELY

Report #11635934

BAB IPENDAHULUAN Latar Belakang Di zaman modern, penggunaan sumber daya terbarukan seperti matahari, udara, angin, dan sumber daya lainnya semakin meningkat. [1]Dalam kehidupan sehari-hari, energi listrik sangat dibutuhkan, oleh karena itu energi matahari digunakan sebagai sumber energi listrik yang ramah lingkungan dan terbarukan. Perangkat yang disebut panel surya atau fotovoltaik atau PV dan konverter diperlukan untuk memanfaatkan energi surya ini, konverter ini sebagian besar digunakan dalam teknologi terbaru untuk menghitung beban daya. [2] Output panel surya (PV) dikenal sebagai DC dan output panel surya yang dimaksimalkan oleh MPPT yang dikenal sebagai AC menjadi sumber energi untuk peralatan rumah tangga dan peralatan industri. [3]. Inverter bertingkat umum dibentuk dari tiga topologi dasar sementara topologi lain dikembangkan melalui kombinasi atau modifikasi topologi dasar untuk membentuk inverter bertingkat banyak. Konstruksi inverter konvensional dibatasi oleh kualitas komponen daya mereka [4] Topologi yang paling banyak digunakan adalah flying capacitor, diode-clamp, and cascade constructions. Namun, semakin banyak penyebab tingkat -n meningkatkan volume, biaya, dan jumlah saklar dari inverter. Desain asimetris umumnya memenuhi tujuan ini dan dengan meningkatnya tingkatan, Semakin tinggi tingkat inverter, semakin kecil