# Application Note AN-1108

## IRS2111 and IR2111 Comparison

*By Jason Nguyen, Min Fang, David New*

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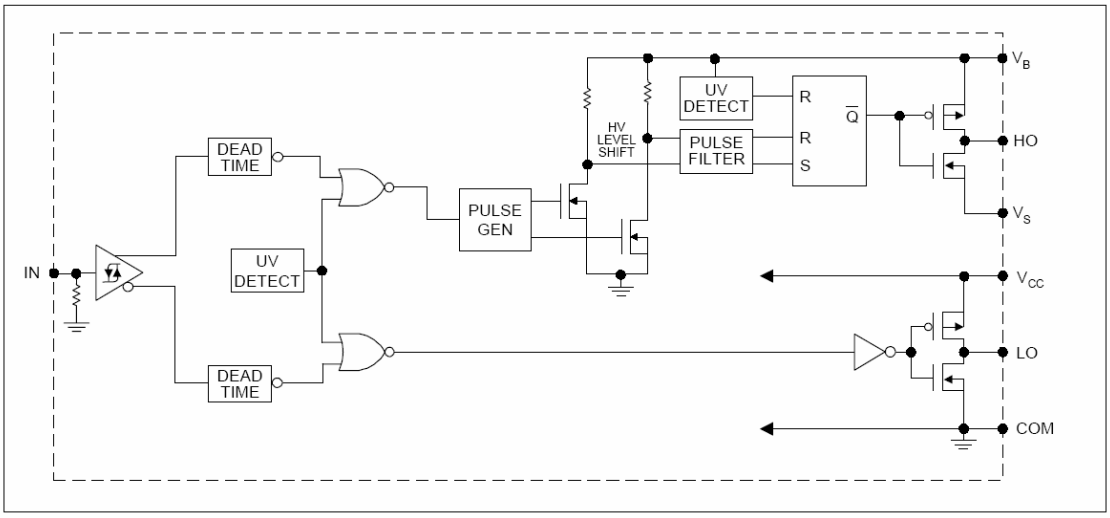
## Introduction

The IRS2111 is a new HVIC product that replaces the IR2111 HVICs and is pin-to-pin compatible with its corresponding predecessor. In many cases, little or no change is necessary to use the new products. This application note describes the various differences between the IRS2111 and the IR2111 HVICs.

The IRS2111 is a high voltage, high speed power MOSFET and IGBT driver with independent high and low side referenced output channels. Proprietary HVIC and latch immune CMOS technologies enable ruggedized monolithic construction. The logic input is compatible with standard CMOS or LSTTL outputs, down to 3.3 V logic. The output drivers feature a high pulse current buffer stage designed for minimum driver cross-conduction. 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 V.

This part is not recommended for motor drive applications. International Rectifier has many parts designed for motor drive applications and these can be found at www.irf.com.

## Block Diagrams




The IRS2111 and IR2111 share the same block diagram. There are no functional changes.

## Electrical Characteristic Differences

All measurement conditions remain unchanged unless noted. Parameters not mentioned in this document have not changed.

### Absolute Maximum Ratings

There are no changes in the Absolute Maximum Ratings.

### Recommended Operating Conditions

There are no changes in the Recommended Operating Conditions.

## Dynamic Electrical Characteristics

| Parameter | | IR2111 | | IRS2111 | | |
|---|---|---|---|---|---|---|
| Symbol | Definition | typ | max | typ | max | Units |
| $t_r$ | Turn-on rise time (Vs = 0 V) | 80 | 130 | 75 | 130 | ns |
| $t_f$ | Turn-off fall time (Vs = 0 V) | 40 | 65 | 35 | 65 | |

The IRS2111 has slightly faster rise and fall times when compared to the IR2111.

## Static Electrical Characteristics

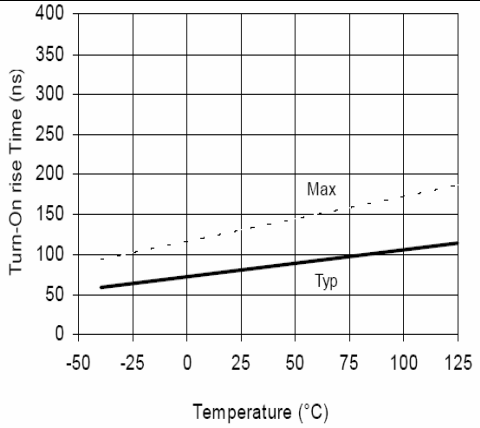
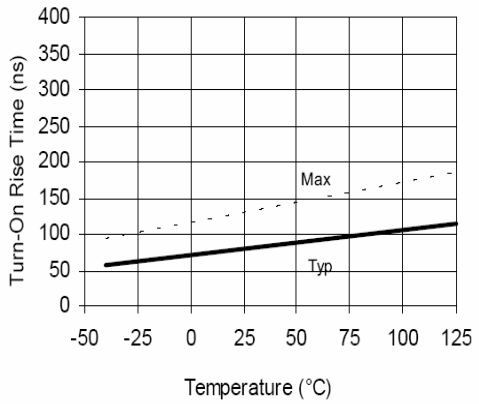
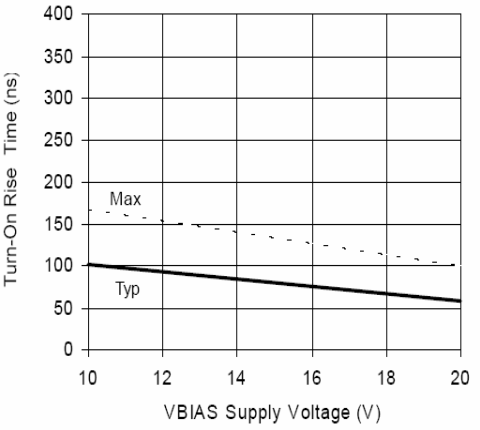
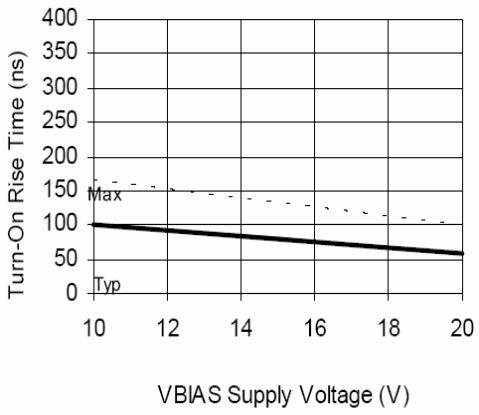
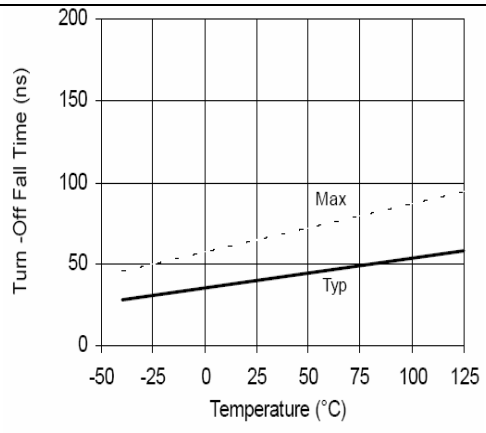
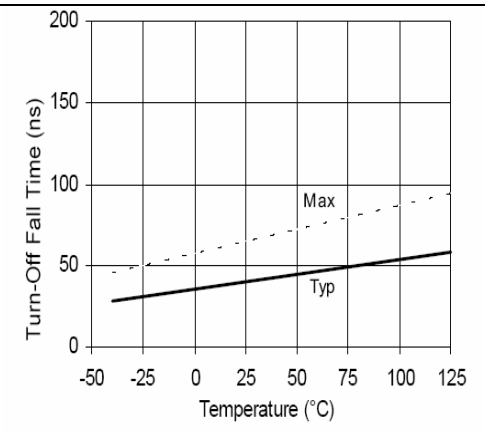
| Parameter | | IR2111 | | | IRS2111 | | | |
|---|---|---|---|---|---|---|---|---|
| Symbol | Definition | min | typ | max | min | typ | max | Units |
| $V_{OH}$ | High level output voltage, $V_{BIAS}$ - $V_O$ ($I_O$ = 20 mA) | - | - | 0.1 | - | 0.05 | 0.2 | V |
| | | Io = 0 A | | | Io = 2 mA | | | |
| $V_{OL}$ | Low level output voltage, $V_O$ ($I_O$ = 20 mA) | - | - | 0.1 | - | 0.02 | 0.1 | |
| | | Io = 0 A | | | Io = 2 mA | | | |
| $I_{O+}$ | Output high short circuit pulsed current ($V_O$ = 0 V, VIN=Logic "1", PW <= 10us) | 200 | 250 | - | 200 | 290 | - | mA |
| $I_{O-}$ | Output low short circuit pulsed current ($V_O$ = 15 V, VIN = Logic "0", PW <= 10us) | 420 | 500 | - | 420 | 600 | - | |

With the IRS2111,

1. The $V_{OH}$ and $V_{OL}$ are tested using a new standardized test condition of Io=2 mA. The output driver's on resistance is slightly lower for the IRS2111.
2. The typical value for $I_{O+}$ has increased slightly. The typical value for $I_{O-}$ has increased by 20%.

## Figures

This figures shown in this section compare figures shown in the IR2111 (left column) and IRS2111 (right column) datasheets. Illustrations that have not changed between the two datasheets have not been included in this section.

| IR2111 | IRS2111 |
|---|---|
|  |  |
| **Figure 13A Turn-On RiseTime vs Temperature** | **Figure 9A Turn-On RiseTime vs Temperature** |
|  |  |
| **Figure 13B Turn-On RiseTime vs Voltage** | **Figure 9B Turn-On RiseTime vs Voltage** |
|  |  |
| **Figure 14A Turn-Off Fall Time vs Temperature** | **Figure 10A Turn-Off Fall Time vs Temperature** |

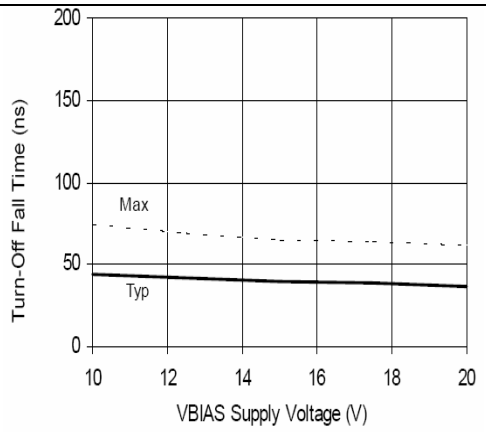



Figure 14B Turn-Off Fall Time vs Voltage

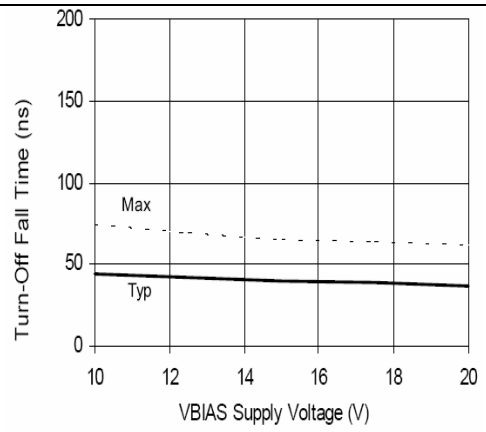



Figure 10B Turn-Off Fall Time vs Voltage

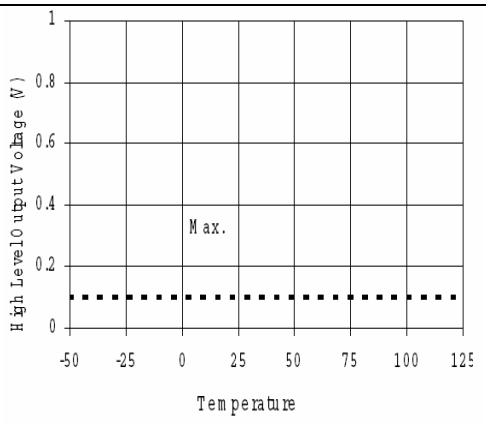



Figure 18A. High Level Output vs. Temperature

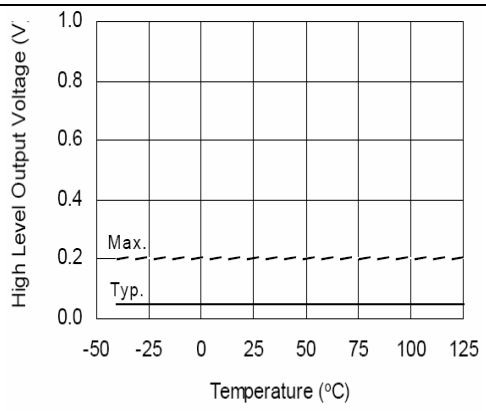



Figure 14A. High Level Output vs. Temperature

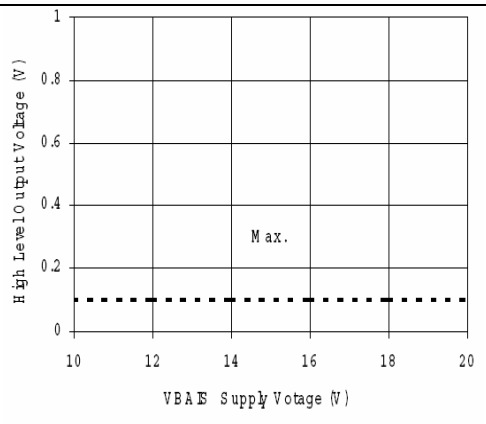



Figure 18B. High Level Output vs. Voltage

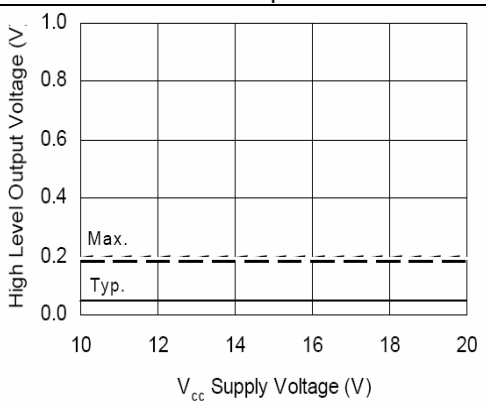



Figure 14B. High Level Output vs. Supply Voltage

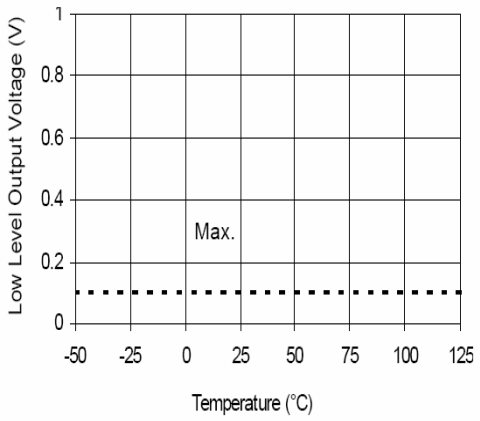



Figure 19A. Low Level Output vs. Temperature

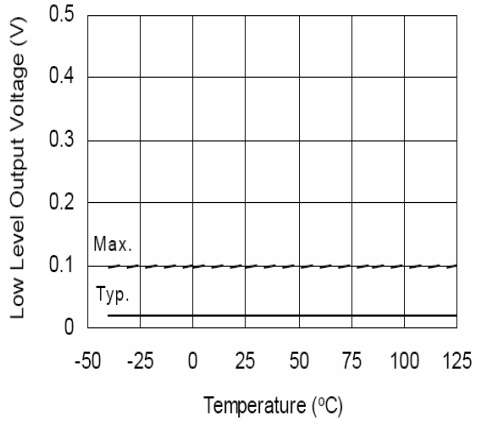



Figure 15A. Low Level Output vs. Temperature

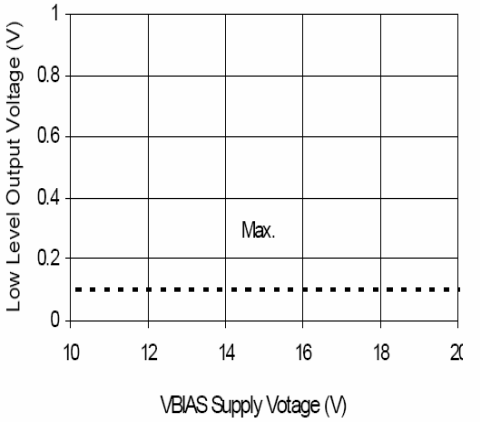



Figure 19B. Low Level Output vs. Voltage

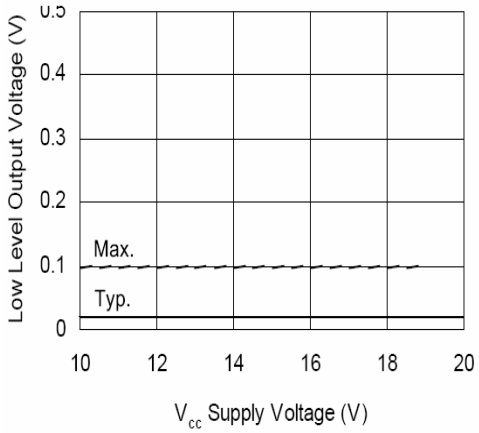



Figure 15B. Low Level Output vs. Voltage

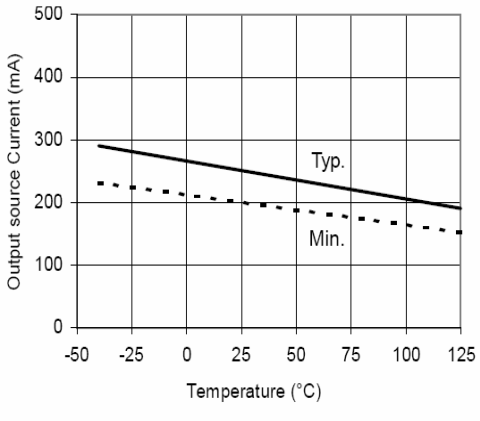



Figure 29A Output Source Current vs Temperature

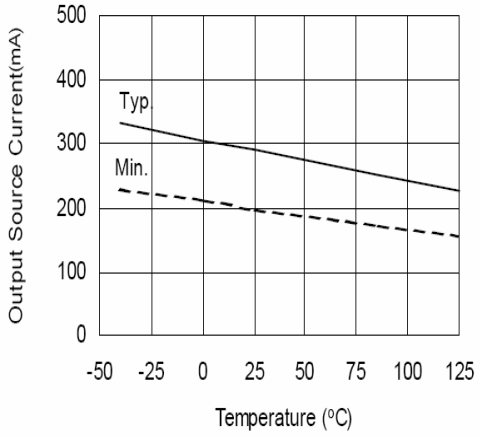



Figure 25A Output Source Current vs Temperature

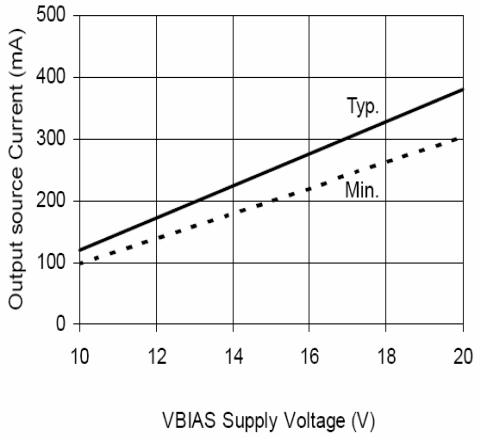



**Figure 29B Output Source Current vs Voltage**

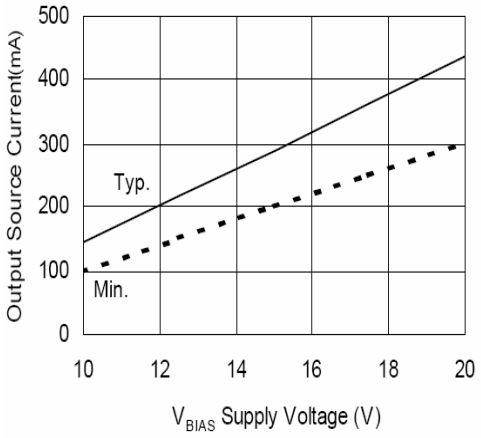



**Figure 25B Output Source Current vs Voltage**

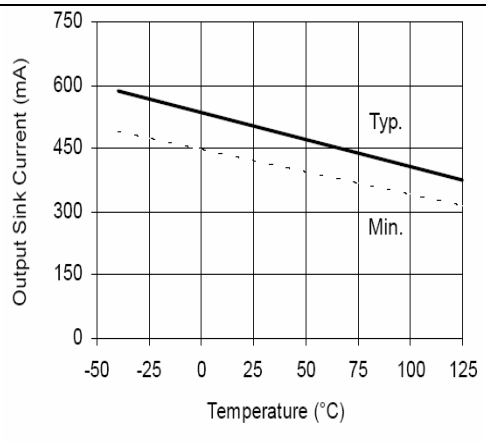



**Figure 30A Output Sink Current vs Temperature**

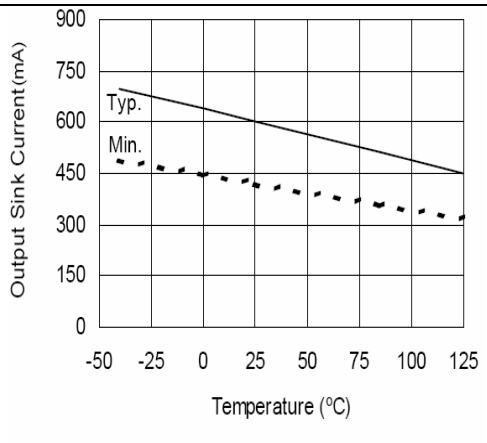



**Figure 26A Output Sink Current vs Temperature**

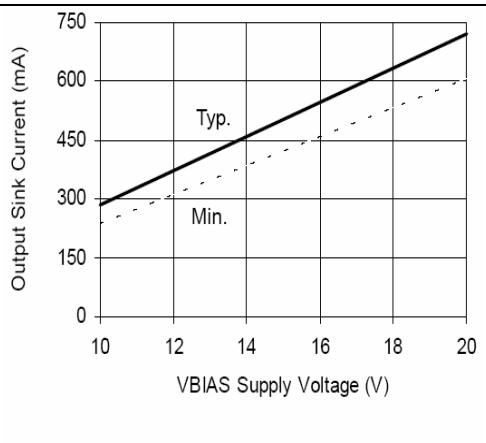



**Figure 30B Output Sink Current vs Voltage**

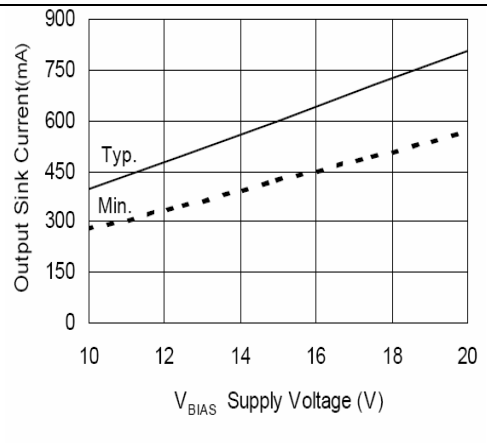



**Figure 26B Output Sink Current vs Voltage**

## Summary

As shown by this document, the IRS2111 and the IR2111 are very similar with only a few parametric differences.