

# **G5 HVIC New Product Offering: IRS2101**

Energy Saving Products  
International Rectifier  
El Segundo, CA

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## **HVIC Evolution**

International Rectifier has invested (and continues to invest) in a new IC process that will support the continued improvement of our HVICs and allow these improvements to be realized while keeping price under control. This new process is referred to as G5 HVIC.

The adoption of a new IC process as an existing IC process approaches its limits is part of the natural progression in IC evolution. The G5 HVIC process allows improvements in device capabilities, tighter specifications, temperature stability, functions/\$, and the integration of previously unavailable features at an attractive price point.

Two categories of products have emerged from this new technology; G5 HVIC new products, and G5 HVIC replacement products (to replace existing HVIC products).

# Process Comparison: HVIC & G5 HVIC



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- **G5 HVIC products are grouped in two categories**
  - New products (e.g., with integrated bootstrap functionality, PFC, brake drive, etc.)
  - Upgraded version of existing HVICs (e.g., improved input filters, etc.)
- **G5 HVIC replacement products are pin-to-pin compatible with their predecessors**
- **Process identification**
  - IRSxxxx part numbers (G5 HVIC technology)
  - IR2(0,1,3,5)xx & IR44xx part numbers (existing HVIC technology)

# Adopting G5 HVIC: IRS2101

**Immediate improvements in functionality/\$**

**Capable of rapid improvements in functionality & capability**

**Previously unavailable features integrated at attractive price**

- Improved clamping structure provides additional spike protection
- Higher output sink/source capability
- Improved matching time
- Improved temperature stability
- Higher signal to noise rejection at input and improved logic threshold values
- Improved DC operation under negative  $V_s$  conditions
- Pin-to-pin compatible  
IR2101(S): IRS2001(S),  
IRS2101(S), IRS2106(S), &  
IRS2308(S)

# Adopting G5 HVIC: IRS2101

	(units)	IRS2001	IR2101	IRS2101	IRS210(6,64)	IRS2110	IRS2112	IRS2113	IRS218(1,14)	IRS218(6,64)	IRS2301
Offset voltage	V	200	600	600	600	500	600	600	600	600	600
Matched prop. delay	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SD Pin		No	No	No	No	Yes	Yes	Yes	No	No	No
Dual supply		No	No	No	No	Yes	Yes	Yes	No	No	No
<b>INPUT LOGIC</b>											
Logic compatibility	V	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	3.3-20	3.3-20	3.3-20	3.3, 5	3.3, 5	3.3, 5, 15
HIN, LIN	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>OUTPUT</b>											
V <sub>out</sub>	V	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	5-20
I <sub>O+</sub>	mA	290	210	290	290	2500	290	2500	1900	4000	290
I <sub>O-</sub>		600	360	600	600	600	2500	600	2500	2300	4000
<b>UVLO</b>											
V <sub>BSUV+</sub>	V	-	-	-	8.9	8.6	8.5	8.6	8.9	8.9	4.1
V <sub>BSUV-</sub>		-	-	-	8.2	8.2	8.1	8.2	8.2	8.2	3.8
V <sub>BSUVH</sub>		-	-	-	0.7	-	-	-	0.7	0.7	0.3
V <sub>CCUV+</sub>		8.9	8.9	8.9	8.9	8.5	8.6	8.5	8.9	8.9	4.1
V <sub>CCUV-</sub>		8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	3.8
V <sub>CCUVH</sub>		-	-	-	0.7	-	-	-	0.7	0.7	0.3
<b>TIMING</b>											
t <sub>on</sub>	ns	160	160	160	220	130	135	130	180	170	220
t <sub>off</sub>		150	150	150	200	120	130	120	220	170	200
t <sub>sd</sub>						130	130	130			
t <sub>r</sub>		70	100	70	100	25	75	25	40	22	100
t <sub>f</sub>		35	50	35	35	17	35	17	20	18	35
MT		50 (max)	50 (max)	50 (max)	30 (max)	10 (max)	30 (max)	20 (max)	35 (max)	35 (max)	50 (max)

High and Low Side Driver Comparison

# Adopting G5 HVIC: IRS2101

	(units)	IRS2001	IR2101	IRS2101	IRS2106	IRS2308
Offset voltage	V	200	600	600	600	600
Driver type		High/low	High/low	High/low	High/low	Half-bridge
Matched prop. delay	-	Yes	Yes	Yes	Yes	Yes
Programmable DT			No			No
<b>INPUT LOGIC</b>						
Logic Compatibility	V	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15
HIN, LIN/N						
HIN/N, LIN						
HIN, LIN	-	Yes	Yes	Yes	Yes	Yes
IN						
<b>OUTPUT</b>						
$V_{out}$	V	10-20	10-20	10-20	10-20	10-20
$I_{O+}$	mA	290	210	290	290	290
$I_{O-}$		600	360	600	600	600
<b>UVLO</b>						
$V_{BSUV+}$	V	-	-	-	8.9	8.9
$V_{BSUV-}$		-	-	-	8.2	8.2
$V_{BSUVH}$		-	-	-	0.7	0.7
$V_{CCUV+}$		8.9	8.9	8.9	8.9	8.9
$V_{CCUV-}$		8.2	8.2	8.2	8.2	8.2
$V_{CCUVH}$		-	-	-	0.7	0.7
<b>TIMING</b>						
$t_{on}$	ns	160	160	160	220	220
$t_{off}$		150	150	150	200	200
$t_{sd}$						
$t_r$		70	100	70	100	100
$t_f$		35	50	35	35	35
MT		50 (max)	50 (max)	50 (max)	30 (max)	
DT						540
MDT						60 (max)

Pin-to-Pin Compatible Products

## **G5 HVIC Tools**

- **IRS2101**
  - [Datasheet](#)
  - [Samples](#)
  - [HVIC Comparison Document](#)
  - Test/Demo Board

## Q&A

- **Will my existing HVIC be able to be replaced by its G5 HVIC counterpart?**
  - The G5 HVIC replacement products are designed to allow direct replacements of the existing HVIC parts in most applications. In many cases, the design will be able to take advantage of the new integrated bootstrap circuit (i.e., “D-series” HVICs).
- **When will the existing HVIC products no longer be available?**
  - This event will depend on the adoption rate of the G5 HVIC process and other market forces. Customers will be informed of this event and normal procedures will occur.
- **When will I see a reduction in cost for G5 HVIC products?**
  - This will depend on the adoption rate (volume) of the new technology and the maturing of the process. IR has a history of passing on cost savings to our customers as the processes are refined and improved (matured).
- **Will I be able to use the new D-series HVICs in place of my existing HVIC?**
  - In most cases, yes. Not all D-series HVICs are recommended for all applications (please check for details in the datasheet). Not all HVIC models are available with the integrated bootstrap functionality.