Application Note AN-1101

IRS210(8,84) and IR210(8,84) Comparison

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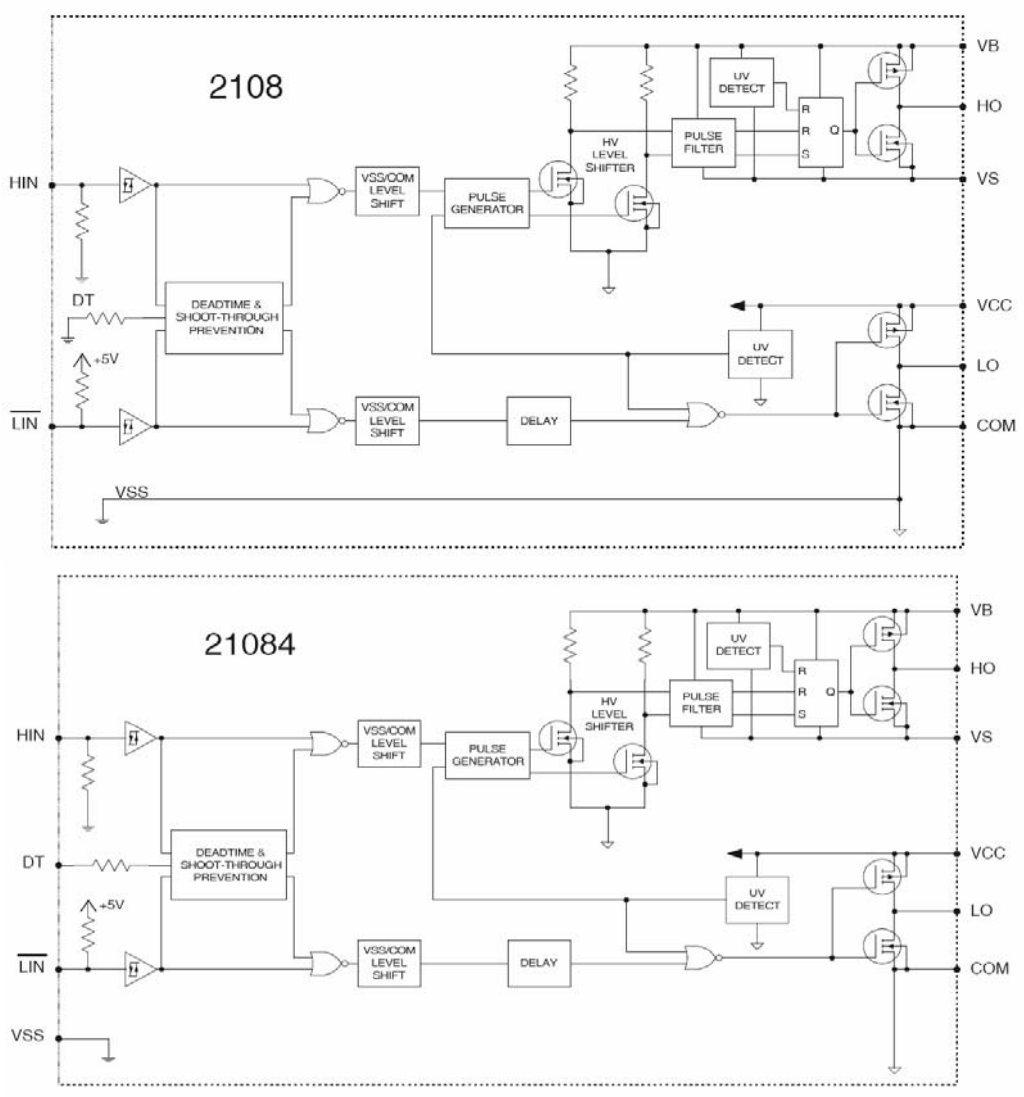
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Introduction

The IRS210(8,84) are new HVIC products that replace the IR210(8,84) HVICs and are pin-to-pin compatible with each 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 IRS210(8,84) and the IR210(8,84) HVICs.

The IRS210(8,84) are high voltage, high speed power MOSFET and IGBT drivers 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.

Block Diagrams



The IRS2108 and the IR2108 share the same block diagram. The IRS21084 and the IR21084 share the same block diagram. There are no functional changes between corresponding part numbers.

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		IR210(8,84)		IRS210(8,84)		Units
Symbol	Definition	typ	max	typ	max	
t_r	Turn-on rise time (Vs = 0 V)	150	220	100	220	ns
t_f	Turn-off fall time (Vs = 0 V)	50	80	35	80	

The IRS210(8,84) have faster rise and fall times when compared to the IR210(8,84).

Static Electrical Characteristics

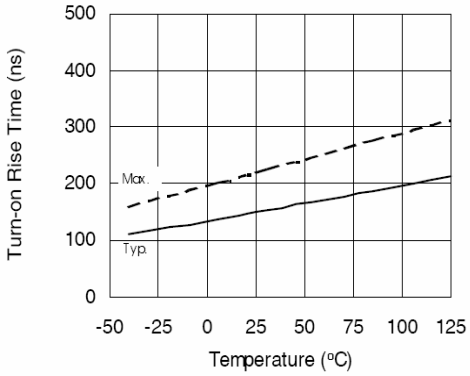
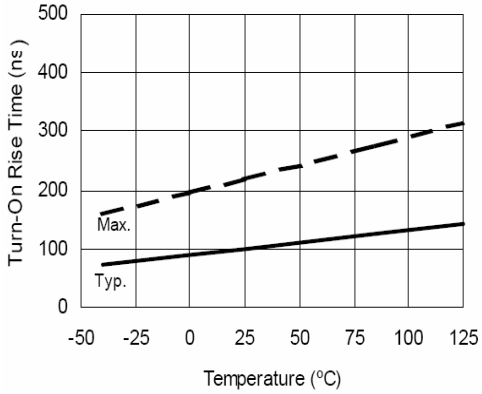
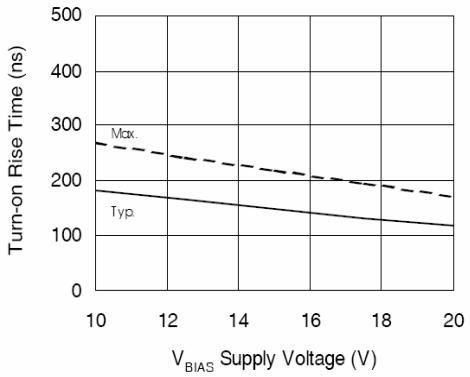
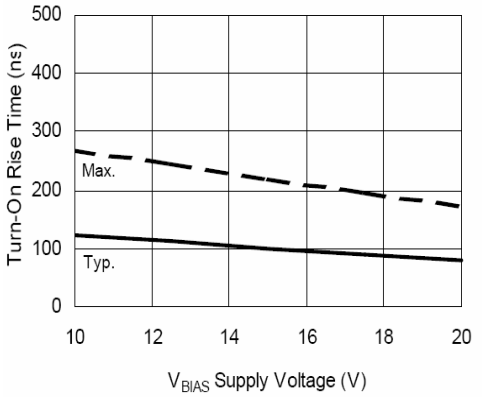
Parameter		IR210(8,84)			IRS210(8,84)			Units
Symbol	Definition	min	typ	max	min	typ	max	
V_{IH}	Logic "1" input voltage (V_{CC} = 10 V to 20 V)	2.9	-	-	2.5	-	-	V
V_{IL}	Logic "0" input voltage (V_{CC} = 10 V to 20 V)	-	-	0.8	-	-	0.8	
V_{OH}	High level output voltage, V_{BIAS} - V_O (I_O = 20 mA)	-	0.8	1.4	-	0.05	0.2	
		Io = 20 mA			Io = 2 mA			
V_{OL}	Low level output voltage, V_O (I_O = 20 mA)	-	0.3	0.6	-	0.02	0.1	
		Io = 20 mA			Io = 2 mA			
I_{O+}	Output high short circuit pulsed current (V_O = 0 V, VIN=Logic "1", PW <= 10us)	120	200	-	120	290	-	mA
I_{O-}	Output low short circuit pulsed current (V_O = 15 V, VIN = Logic "0", PW <= 10us)	250	350	-	250	600	-	

With the IRS210(8,84),

1. V_{IH} is reduced to 2.5 V for better 3.3 V logic compatibility.
2. 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 lower for IRS210(8,84), which improves immunity against the Miller effect.
3. The typical values for I_{O+} and I_{O-} are increased, which allows faster switching.

Figures

This figures shown in this section compare figures shown in the IR210(8,84) (left column) and IRS210(8,84) (right column) datasheets. Illustrations that have not changed between the two datasheets have not been included in this section.

IR210(8,84)	IRS210(8,84)
 **Figure 6A.Turn-on Rise Time vs. Temperature**	 **Figure 6A. Turn-On Rise Time vs.Temperature**
 **Figure 6B. Turn-on Rise Time vs. Supply Voltage**	 **Figure 6B. Turn-On Rise Time vs. Supply Voltage**

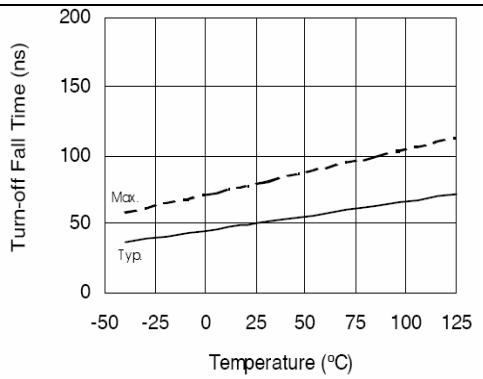


Figure 7A. Turn-off Fall Time vs. Temperature

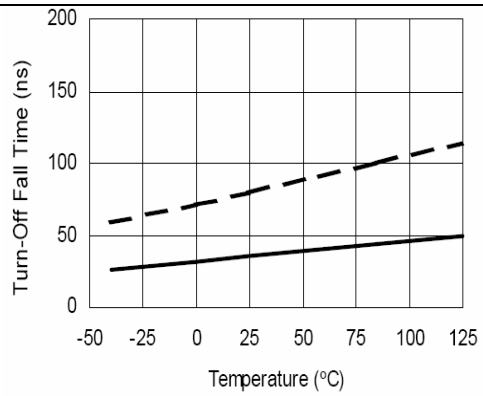


Figure 7A. Turn-Off Fall Time vs. Temperature

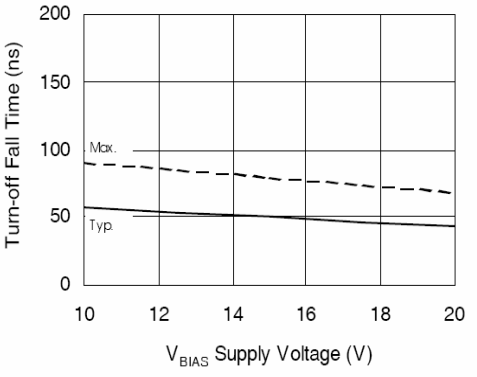


Figure 7B. Turn-off Fall Time vs. Supply Voltage

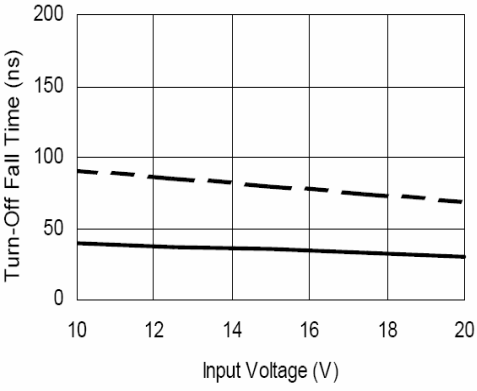


Figure 7B. Turn-Off Fall Time vs. Input voltage

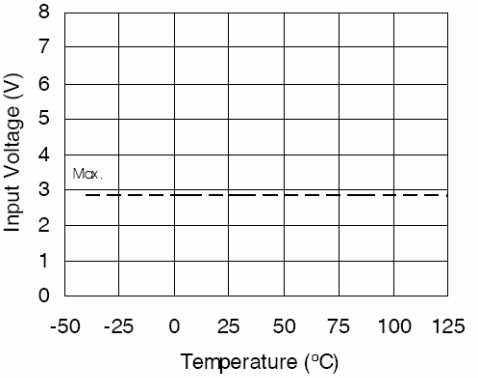


Figure 9A. Logic "1" Input Voltage vs. Temperature

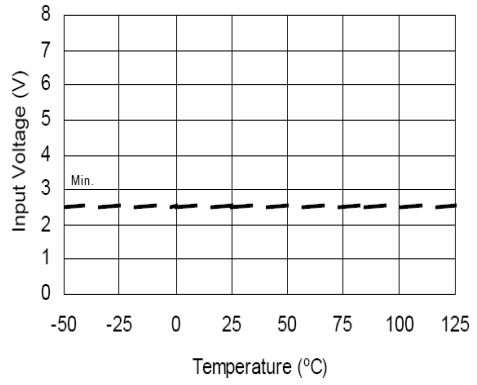


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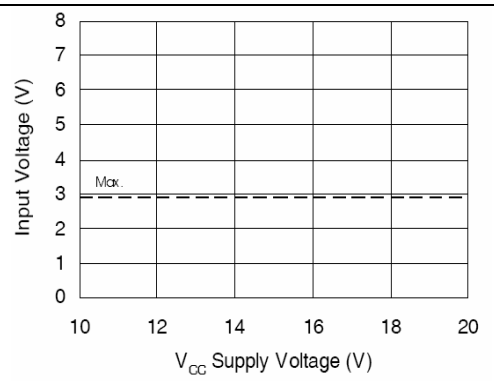


Figure 9B. Logic "1" Input Voltage vs. Supply Voltage

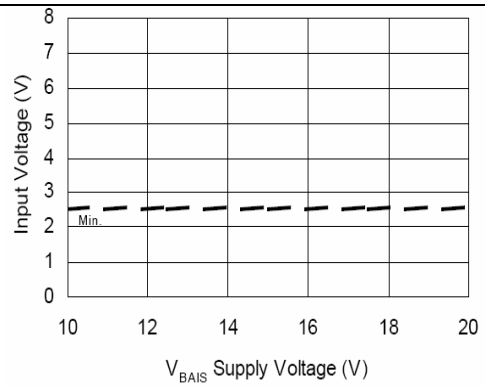


Figure 9B. Logic "1" Input Voltage vs. Supply Voltage

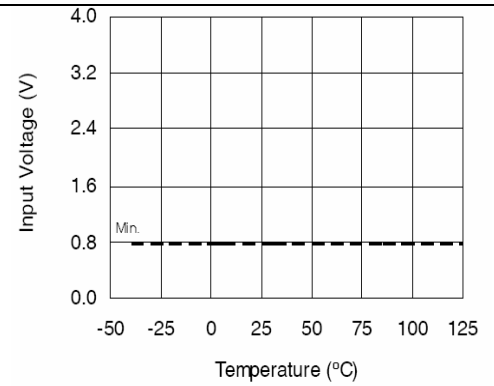


Figure 10A. Logic "0" Input Voltage vs. Temperature

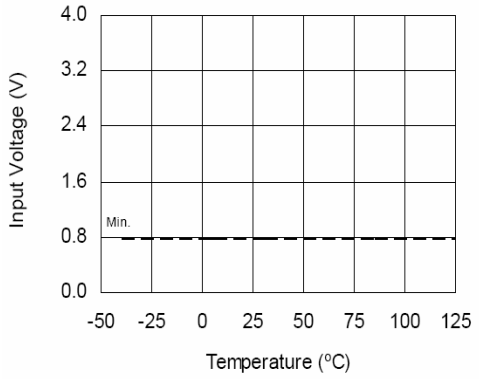


Figure 10A. Logic "0" Input Voltage vs. Temperature

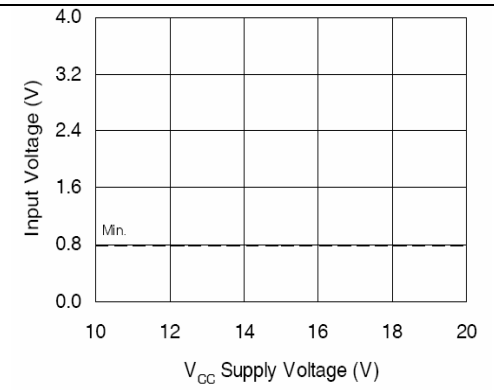


Figure 10B. Logic "0" Input Voltage vs. Supply Voltage

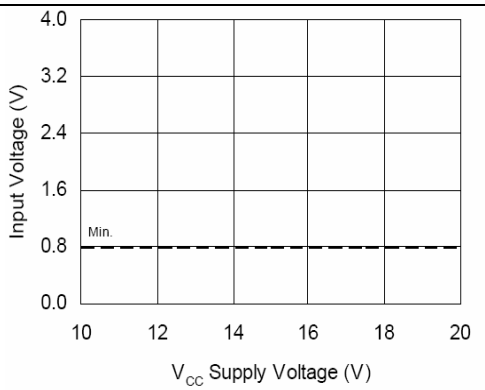


Figure 10B. Logic "0" Input Voltage vs. Supply Voltage

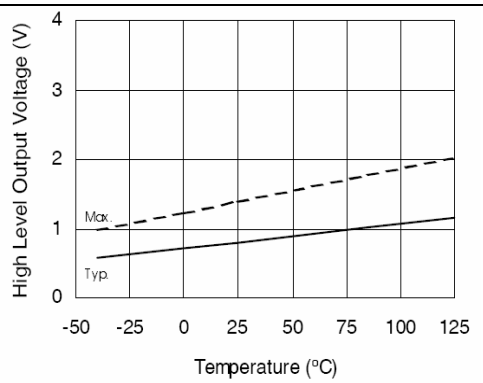


Figure 11A. High Level Output vs. Temperature

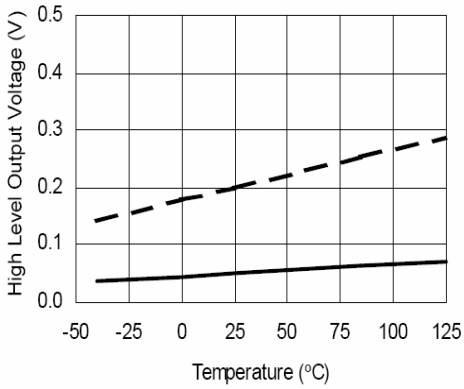


Figure 11A. High Level Output Voltage vs. Temperature

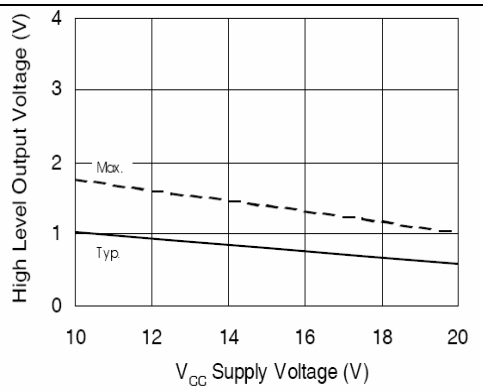


Figure 11B. High Level Output vs. Supply Voltage

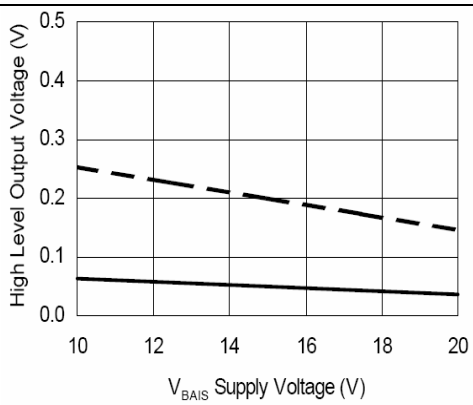


Figure 11B. High Lovel Output Voltage vs. Supply Voltage

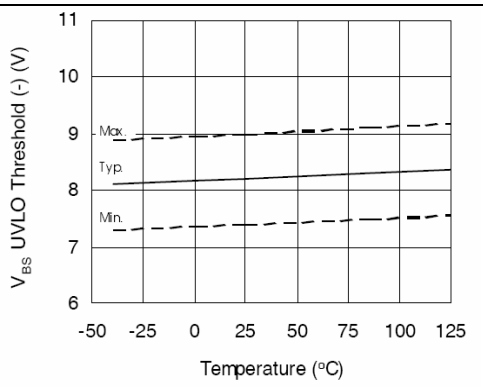


Figure 21. V_{BS} Undervoltage Threshold (-) vs. Temperature

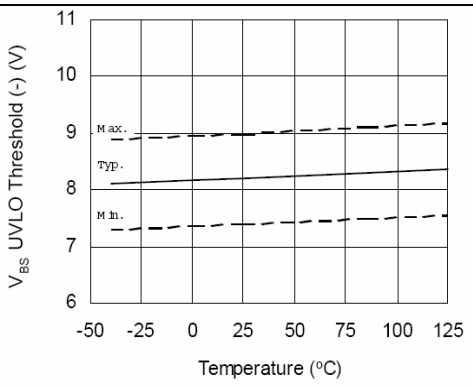


Figure 21. V_{BS} Undervoltage Threshold (-) vs. Temperature

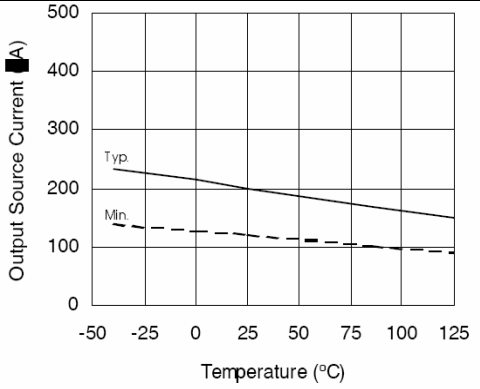


Figure 22A. Output Source Current vs. Temperature

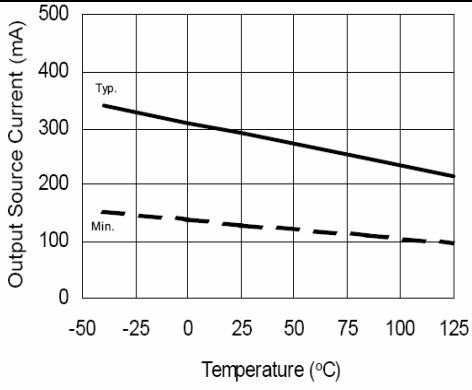


Figure 22A. Output Source Current vs. Temperature

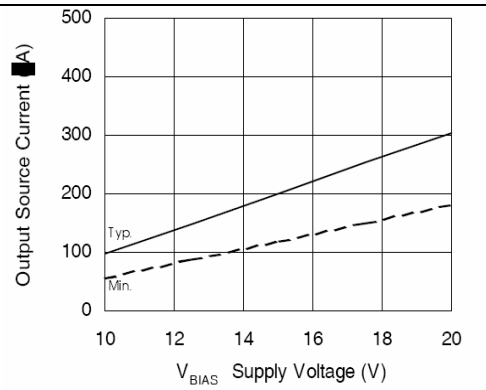


Figure 22B. Output Source Current vs. Supply Voltage

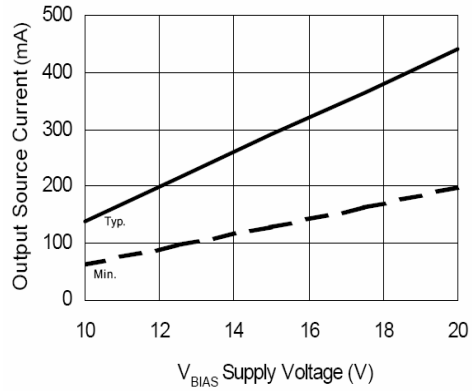


Figure 22B. Output Source Current vs. Supply Voltage

Summary

As shown by this document, the IRS210(8,84) and the IR210(8,84) are very similar with only a few negligible parametric differences.