

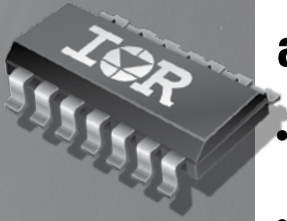
High Voltage Gate Drive IC Product Selection Guide



For a complete list of IR HVICs go to <http://power.irf.com/hvic/>

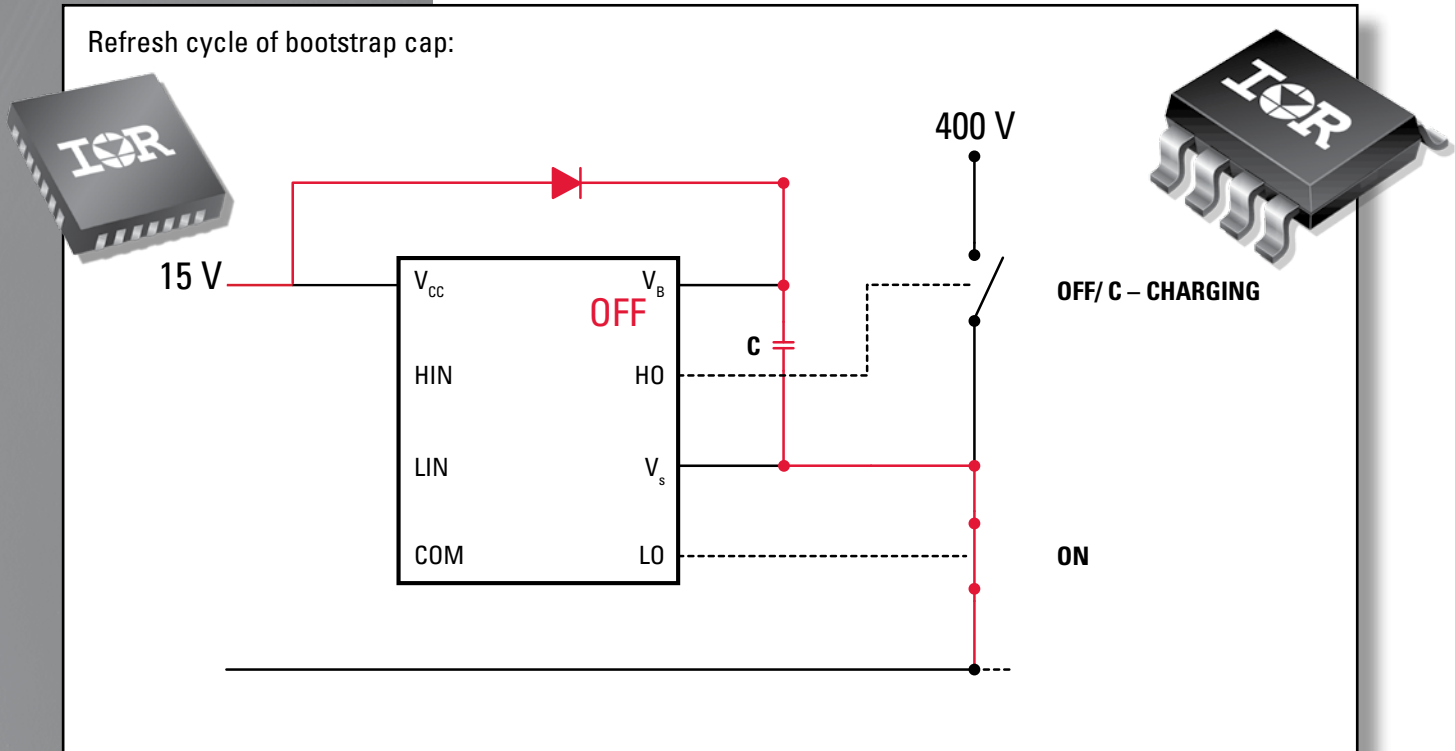
International
IR Rectifier
THE POWER MANAGEMENT LEADER

High Voltage Gate Drive ICs eliminate the need for floating supply to simplify design and improve efficiency

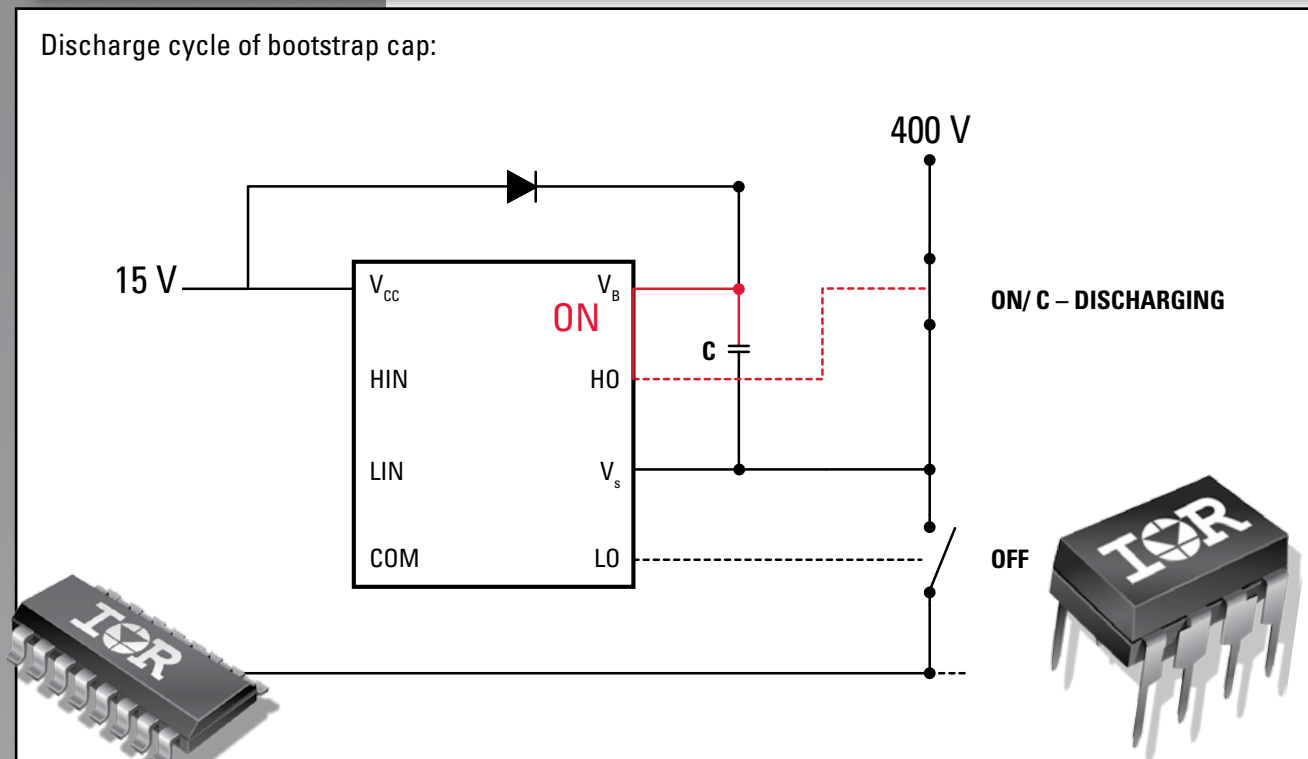


- Boot Strap Capacitor Voltage is generated above DC+ to drive High-side GATE of IGBT/FET
- Diode, Buffer Capacitor, but no floating or isolated Power supply

Refresh cycle of bootstrap cap:



Discharge cycle of bootstrap cap:



Typical Selection Flow

Get the full table here:

<http://power.irf.com/hvic/>

Critical System Criteria

Number of Channels	1-2-3-4-5-6-7
Source/Sink Drive current	60-4000mA
Voltage	1200V-700V-600V-200V

Step: 1

Driver Specifications

Channels linked or Independent	Split HS-LS Channels or Interlinked (DT protected)
Inputs	Single or Split per 2 channels
Under Voltage Lock-Out	BBS-UV, VCC-UV (+/-) (Which Device are you Driving?)
Dead-Time	Programmable, Fixed or None
Ton/Toff	Switching frequency

Step: 2

Additional Features

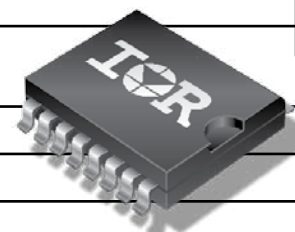
Input On-Off Logic	Direct, Inverse, Mix
Ground Lay-Out	Separated Power Ground and Logic Ground
Shut Down / Reset	Drivers with it, or without it
Over Current Protection	DC-Bus or Ground Detection
Negative Ground Transient Stress-Hard Ruggedness	Some ICs are designed for Enhanced -Vs Capability
Package	QFN, PLCC, MQFP, SOIC, DIP
Fault Reporting	

Step: 3

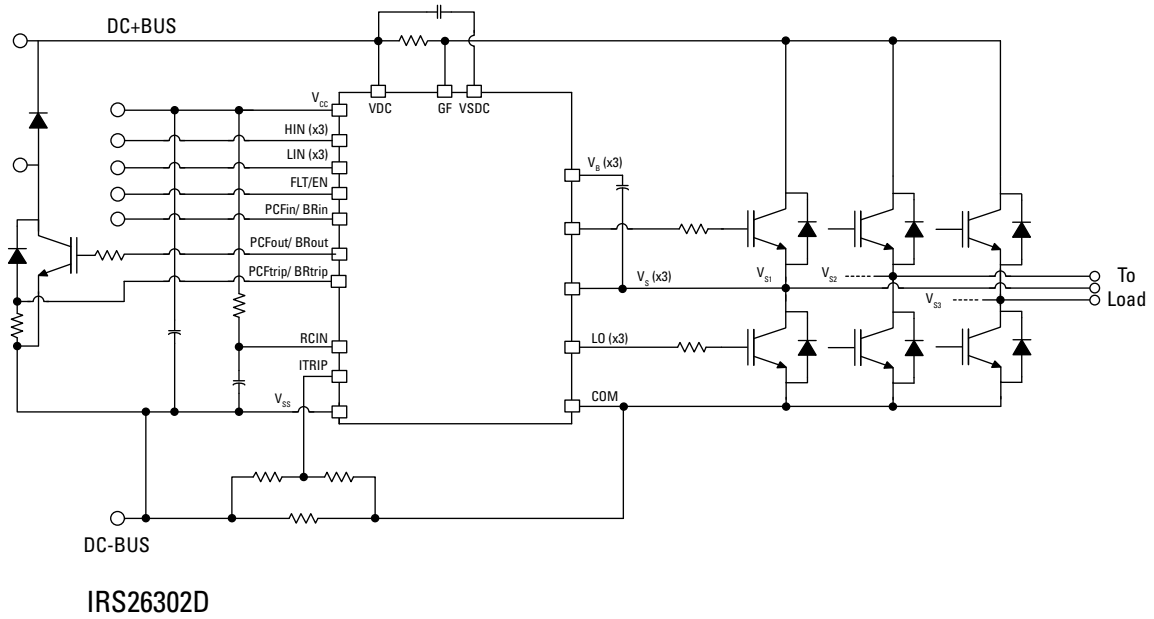
Enhanced and Application Specific Features

Boot Strap Diode Function	Integrated or not
Load Protection	
Internal Oscillator	
Motion Brake Channel	
Additional PFC Driver output Channel (7th Channel)	Extra Channel for PFC or Brake
Extra OpAmps	0, 1, 2 or 3
Current Amplifier Output	

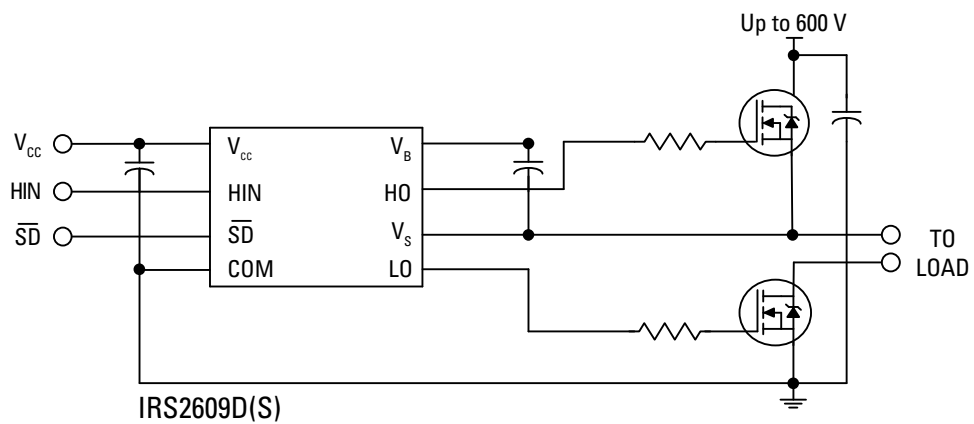
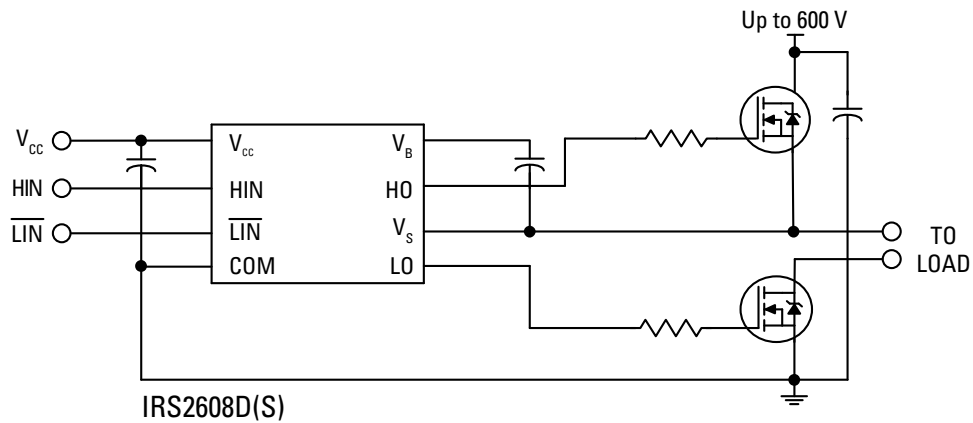
Step: 4



6- & 7-Channel Gate Drivers



2-Channel Drivers (interlinked Channels)



6- & 7-Channel Gate Drivers

V Offset (V)	I-Sink mA	I-Source mA	Features			Package					
						SOIC20	MLP05X5	DIP28	SOIC28	PLCC44	MLP07X7
600	350	200		Active Low	W/ integrated BS Diodes Best for Sinusoidal Modulation				IRS2336DS	IRS2336DJ	IRS2336DM
	350	200		Active High	W/ integrated BS Diodes Best for Sinusoidal Modulation				IRS23364DS	IRS23364DJ	
	350	200	Trapezoidal & Sinusoidal Modulation w/o BSD					IRS26364S	IRS26364J	IRS26364M	
	350	200	3 Phase Bridge w/o BS diode				IRS2334S	IRS2334M	IR213(0, 1, 2, 3, 5, 6, 62, 63, 65, 7, 81)	IRS2336S IR213(0, 1, 2, 3, 5, 6, 62, 63, 65, 7, 81)S	IRS2336J IR213(0, 1, 2, 3, 5, 6, 62, 63, 65, 7, 81)J
	500	200	3 Phase Bridge w/ Integrated OpAmp	W/ integrated BS Diodes Best for Sinusoidal Modulation					IRS2330DS IRS2332DS	IRS2330DJ IRS2332DJ	
	500	200		Trapezoidal & Sinusoidal Modulation w/o BSD					IRS2330S IRS2332S	IRS2330J IRS2332J	
	350	200	3 Phase Bridge & PFC Driver or Brake Driver, Ground Fault Protection							IRS26302DJ	
1200	420	200	3 Phase Bridge					IR2233 IR2235	IR2233S IR2235S	IR2233J IR2235J	

2-Channel Drivers (Interlinked Channels)

V Offset (V)	I-Sink mA	I-Source mA	Features		Package						
					SOIC8	DIP8	MLP04X4	SOIC14	DIP14	SSOP24	
200	600	290	Half Bridge with Fixed DT	HIN,LIN/N	IRS2003S	IRS2003	IRS2003M				
	600	290		IN, SD/N	IRS2004S	IRS2004	IRS2004M				
600	360	210	Half Bridge with Fixed DT, , and UVLO_ VCC/VBS unless specified	HIN, LIN/N	IRS2103S	IRS2103	IRS2103M				
	2300	1900			IRS2183S	IRS2183					
	600	290			IRS2108S	IRS2108					
	600	290		IN, SD/N	IRS2104S	IRS2104	IRS2104M				
	2300	1900			IRS2184S	IRS2184					
	600	290			IRS2109S	IRS2109					
	600	290		IN, no SD	IRS2111S	IRS2111	IRS2111M				
	600	290		HIN, LIN	IRS2308S	IRS2308	IRS2308M				
	600	290			IRS2304S	IRS2304	IRS2304M				
	3000	2000		Half Bridge with Fixed DT, OCDS & SSD	DSH/L Passive Biased						IR2114SS
	3000	2000			DSH, HSL Active Biased						IR21141SS
	600	290		Half Bridge with Programmable DT, Ground Pins VSS/COM unless specified	HIN, LIN/N			IRS21084M	IRS21084S	IRS21084	
	1800	1400						IRS21834M	IRS21834S	IRS21834	
	600	290			IN, SD/N			IRS21094M	IRS21094S	IRS21094	
2300	1900					IRS21844M	IRS21844S	IRS21844			
600	290	IN, SD/N				IRS21091M	IRS21091S	IRS21091			
600	290	Half Bridge with Integrated BS Diode and -Vs immunity	HIN, LIN/N	IRS2608DS	IRS2608D						
350	200		IN, SD/N	IRS2609DS	IRS2609D						
1200	3000	2000	Half Bridge with Fixed DT	DSH/L Passive Biased						IR2214SS	
	3000	2000		DSH/L Active Biased						IR22141SS	

Planned Parts	Recent Parts	Stress-Hard
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2-Channel Drivers (Independent Channels)

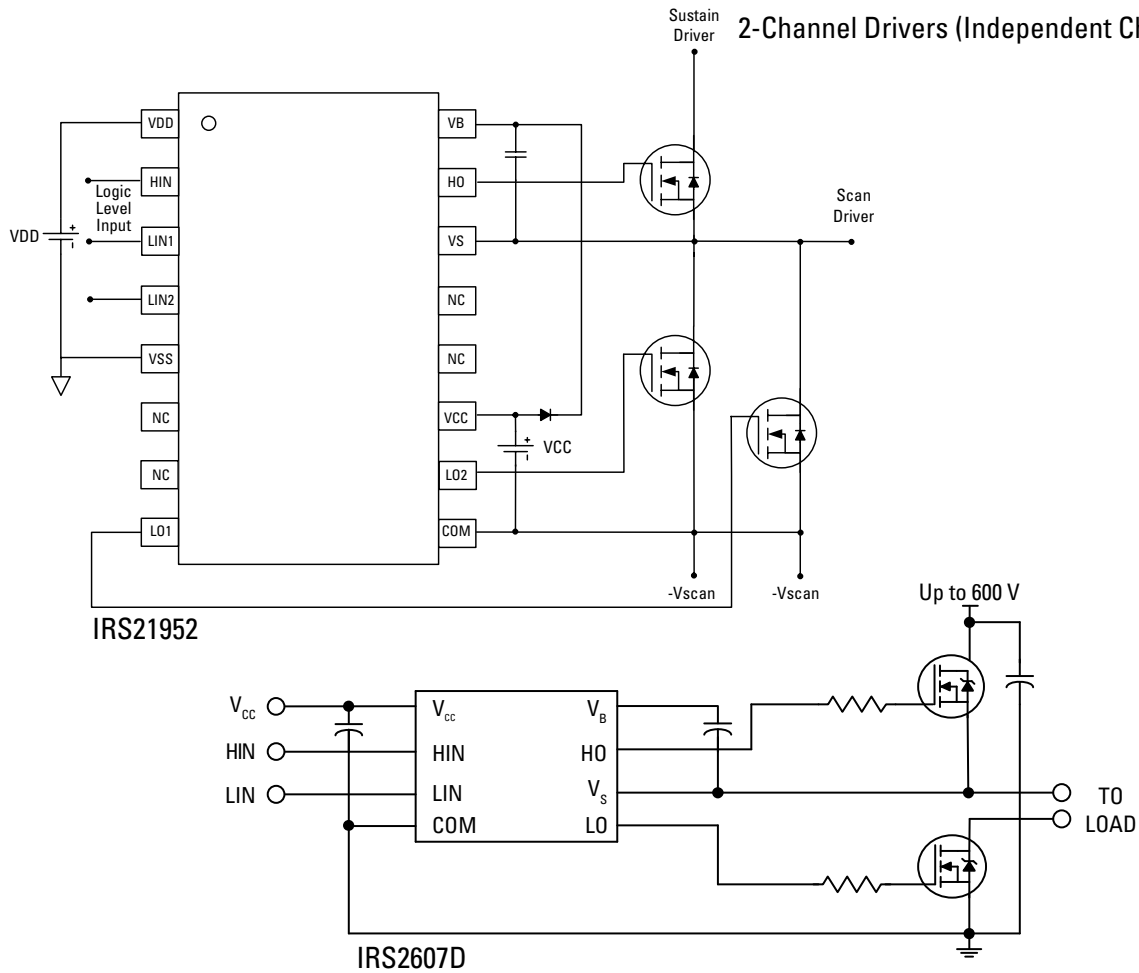
V Offset (V)	I-Sink mA	I-Source mA	Features		Package								
					SOIC8	DIP8	MLPQ4X4	SOIC14	DIP14	SOIC16	SOIC16N		
200	600	290		No SD		IRS2001S	IRS2001	IRS2001M					
	1000	1000				IRS2011S	IRS2011	IRS2011M					
	3000	3000								IR2010	IR2010S		
500	2500	2500								IRS2110	IRS2110S		
600	2500	2500	SD	VSS/COM			IRS2113M			IRS2113	IRS2113S		
	360	210	No SD	COM		IRS2101S	IRS2101	IRS2101M					
	350	200				IRS2301S	IRS2301	IRS2301M					
	600	290				IRS2106S	IRS2106						
	600	290	No SD	VSS/COM				IRS21064M	IRS21064S	IRS21064			
	600	290			Short Propagation			IRS210614M	IRS210614S				
	600	290	SD	VSS/COM				IRS2112M		IRS2112	IRS2112S		
	600	2300	1900	No SD	COM		IRS2181S	IRS2181					
		2300	1900		VSS/COM				IRS21814M	IRS21814S	IRS21814		
		4000	4000	No SD	COM		IRS2186S	IRS2186					
		4000	4000		VSS/COM					IRS21864S	IRS21864		
		350	200	HS & LS Drivers with Integrated BS Diode and -Vs immunity			IRS2607DS	IRS2607D					
		250	120			Disabled Input Filter	IRS26072DS						
		500	500	3-Channel, 1 HS and 2 LS Drivers									IRS21952S IRS21953S
	1200	2500	2000	Output in Phase with Input							IR2213	IR2213S	

1- & 2-Channel & Current Sense ICs

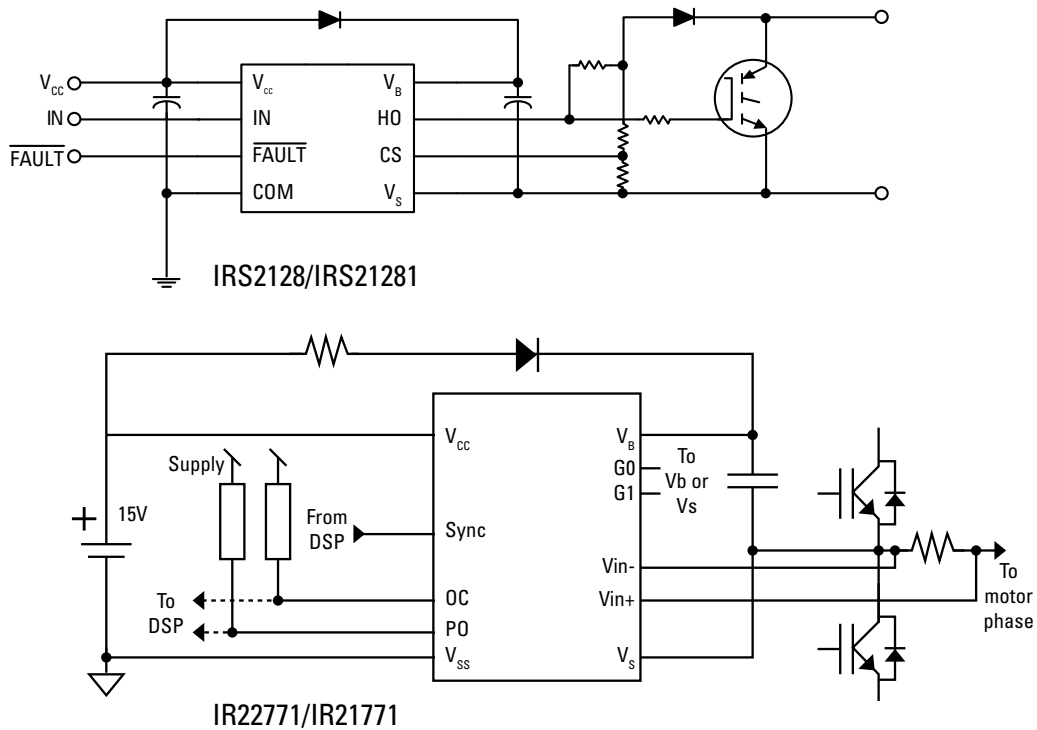
Topologies	V Offset (V)	I-Sink mA	I-Source mA	Features		Package				
						SOIC8	DIP8	SOIC16N	SOIC16	
High Side Drivers and with Over Current Shutdown	500	3300	1600	Current Sensing Single Channel Driver			IR2125		IR2125S	
	600	4000	4000	Single	UVLO_Vcc&VBS		IRS21850S			
		600	290		IN/N	IN Vth 9.5 / 6V	IRS2118S	IRS2118		
		600	290	Over Current Shutdown		Output in Phase with Input	IRS2127S IRS21271S			
		600	290			Output out Phase with Input	IRS2128S IRS21281S			
Dual High Side Driver	600	2000	2000	Dual High Side Driver, UVLO_Vcc&VBS				IRS21853S		
Low Side Drivers	20	3300	1600	Current Limiting Low Side Driver			IR2121			
		3300	2300	Dual Low Side Drivers	Output out of Phase with Input		IR4426S	IR4426		
		3300	2300		Output in Phase with Input		IR4427S	IR4427		
		3300	2300		Output out of Phase with Input-A and in Phase with Input-B		IR4428S	IR4428		
Current Sensing IC	600	-	-	Linear Current Sensing		IR2175S	IR2175			
		-	-	Phase Current Sensor IC					IR21771S IR21775S	
	1200	-	-	Phase Current Sensor IC					IR22771S IR22775S	

Typical Connections

2-Channel Drivers (Independent Channels)



1- & 2-Channel & Current sense ICs



Product Line	Applications	Key Products
 <p>Energy Saving Products</p> <p>Integrated design platforms that enable customers to add energy-conserving features that achieve lower operating energy costs and manufacturing Bill of Material (BOM) costs.</p>	<ul style="list-style-type: none"> • Appliances • Audio • Display • Industrial • Lighting • SMPS 	<ul style="list-style-type: none"> • Digital Control ICs • High-Voltage ICs • IGBTs • IRAM Integrated Power Modules • MERs
 <p>Enterprise Power</p> <p>Optimized power management system solutions that deliver benchmark power density, efficiency and performance in enterprise power.</p>	<ul style="list-style-type: none"> • Servers • Storage Networks • Switchers & Routers • Workstations • Notebooks • Game Stations • Set-Top Box 	<ul style="list-style-type: none"> • DirectFET[®] <i>plus</i> • Low-Voltage ICs • SupIRBuck[®] • iPOWIR[®] • PowIRstage[®] • CHiL Digital Controllers
 <p>Automotive</p> <p>Automotive grade power management solutions qualified to meet the needs of 12V, 24V and HEV/EV applications with a zero defect goal.</p>	<ul style="list-style-type: none"> • AC and DC Motor Drives • Powertrain / Engine control • Body Electronics • Lighting • Class D Audio • Heavy Loads and Actuators 	<p>Automotive Qualified:</p> <ul style="list-style-type: none"> • HEXFET[®] Power MOSFETs • Intelligent Power Switches • Driver ICs • IGBTs • DirectFET[®] 2
 <p>Benchmark MOSFETs</p> <p>IR continues to lead the industry by offering power MOSFETs with the lowest $R_{DS(on)}$ and widest range of packages up to 250V for a diverse range of applications.</p>	<ul style="list-style-type: none"> • Audio • Computing • Communications • Motor Control • Power Supply • Synchronous Rectification 	<ul style="list-style-type: none"> • Discrete HEXFET[®] MOSFETs • Dual HEXFET[®] MOSFETs • FETKY[®]
 <p>HiRel</p> <p>Our discrete components, complex hybrid power module assemblies and rugged DC-DC converters utilize leading-edge power technology which, together with demanding environmental specifications help engineers to meet their toughest design challenges.</p>	<ul style="list-style-type: none"> • Space • Military • Commercial Aviation • Rugged Industrial • Medical 	<ul style="list-style-type: none"> • RAD-Hard MOSFETs • Power Modules/Hybrid Solutions • Motor Control Solutions • DC-DC Converters