

Motion Control High Voltage IC Product Offering

Single Channel Driver						
	(units)	IR2117	IR2118	IR2127	IR21271	IR2128
Offset voltage	V	600	600	600	600	600
Current sensing	-	No	No	Yes	Yes	Yes
INPUT LOGIC						
Logic compatibility	V	10-20	10-20	3,5,15	3,5,15	3,5,15
IN	-	Yes		Yes	Yes	
$\overline{\text{IN}}$	-		Yes			Yes
OUTPUT						
V_{out}	V	10-20	10-20	12-20	9-20	12-20
Output high short circuit pulsed current	mA	250	250	250	250	250
Output low short circuit pulsed current	mA	500	500	500	500	500
UVLO						
V_{bs} UVLO positive going threshold	V	8.6	8.6	10.3	7.2	10.3
V_{bs} UVLO negative going threshold	V	8.2	8.2	9	6.8	9
V_{cc} UVLO positive going threshold	V	8.6	8.6	-	-	-
V_{cc} UVLO negative going threshold	V	8.2	8.2	-	-	-
TIMING						
Turn-on propagation delay	ns	125	125	200	200	200
Turn-off propagation delay	ns	105	105	150	150	150
Turn-on rise time	ns	80	80	80	80	80
Turn-off rise time	ns	40	40	40	40	40
CS to shutdown propagation delay	ns			240	240	240
CS to FAULT propagation delay	ns			340	340	340
OVER-CURRENT DETECTION						
CS input positive going threshold	mV			250	1800	250

Current Sense ICs							
	(units)	IR2171	IR2175	IR2177	IR21771	IR2277	IR22771
Offset voltage	V	600	600	600	600	1200	1200
Sync sampling measurement system	-	No	No	Yes	Yes	Yes	Yes
Analog output	-	No	No	Yes	No	Yes	No
PWM Output	-	Yes	Yes	Yes	Yes	Yes	Yes
Current Sense							
V_{in} range (for current sense)	mV	±260	±260	±250	±250	±250	±250
Over current threshold (max)	mV	-	-	±470	±470	±470	±470
Supply Current							
Quiescent supply current	mA	1	2	1	1	1	1
Timing							
Sensing latency max delay min (@ 20 kHz)	μs			2.5	2.5	2.5	2.5
Sensing latency max delay max (@ 20 kHz)	μs			7.5	7.5	7.5	7.5
Propagation delay of OC	μs	1.5	2	-	-	-	-
Low true pulse width of OC	μs	1	1.5	-	-	-	-
Frequency							
PWM frequency PO P_{in} (f_{sync} or f_{o})	kHz	41	130	4-20	4-20	4-20	4-20
PWM frequency OUT P_{in} (f_{sync})	kHz			8-20	8-20	8-20	8-20
Bandwidth	kHz	15	15	f_{sync}	f_{sync}	f_{sync}	f_{sync}
Throughput							
Throughput (@ 20 kHz)	kS/s			40	40	40	40
Throughput (f_{out})	kS/s			$2 * f_{\text{sync}}$	$2 * f_{\text{sync}}$	$2 * f_{\text{sync}}$	$2 * f_{\text{sync}}$
Duty Cycle							
Minimum duty cycle	%	7	9	10	10	10	10
Maximum duty cycle	%	93	91	30	30	30	30



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Motion Control High Voltage
IC Product Offering

High Voltage ICs with
Integrated Desat Protection

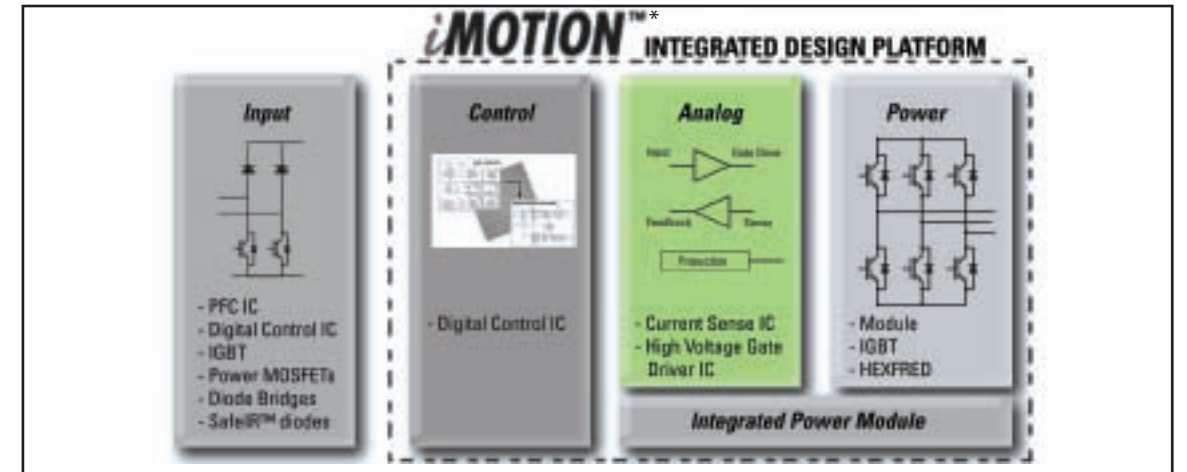
	(units)	Half-Bridge				3-Phase		
		IR2114	IR21141	IR2214	IR22141	IR21381	IR2238	IR22381
Offset voltage	V	600	600	1200	1200	600	1200	1200
Brake	-	No	No	No	No	Yes	Yes	Yes
General purpose comparator input	-	No	No	No	No	No	No	No
Programmable deadtime	-	No	No	No	No	Yes	Yes	Yes
Desat detection circuit	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Active bias (desat)	-	No	Yes	No	Yes	Yes	No	Yes
Soft shutdown (desat)	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hard shutdown	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Input logic for shutdown (SD Pin)	-	No	No	No	No	Yes	Yes	Yes
INPUT LOGIC								
Logic Compatibility	V	2.5	2.5	2.5	2.5	2.5	2.5	2.5
HIN, LIN	-					Yes	Yes	Yes
$\overline{\text{HIN}}$, $\overline{\text{LIN}}$	-	Yes	Yes	Yes	Yes			
OUTPUT								
V_{out}	V	10.4-20	10.4-20	10.4-20	10.4-20	12.5-20	12.5-20	12.5-20
Output high short circuit pulsed current	mA	2000	2000	2000	2000	350	350	350
Output low short circuit pulsed current	mA	3000	3000	3000	3000	540	540	540
UVLO								
V_{bs} UVLO positive going threshold	V	10.2	10.2	10.2	10.2	11.2	11.2	11.2
V_{bs} UVLO negative going threshold	V	9.3	9.3	9.3	9.3	10.2	10.2	10.2
V_{bs} UVLO hysteresis	V	0.9	0.9	0.9	0.9	1	1	1
V_{cc} UVLO positive going threshold	V	10.2	10.2	10.2	10.2	11.2	11.2	11.2
V_{cc} UVLO negative going threshold	V	9.3	9.3	9.3	9.3	10.2	10.2	10.2
V_{cc} UVLO lockout hysteresis	V	0.9	0.9	0.9	0.9	1	1	1
TIMING								
Turn-on propagation delay	ns	440	440	440	440	550	550	550
Turn-off propagation delay	ns	440	440	440	440	550	550	550
Shutdown propagation delay (SD Pin)	ns					600	600	600
Turn-on rise time	ns	24	24	24	24	80	80	80
Turn-off rise time	ns	7	7	7	7	25	25	25
Dead-time	ns	330	330	330	330	100-5000	100-5000	100-5000
Dead-time matching (MDT)	ns	75 (max)	75 (max)	75 (max)	75 (max)	125 (max)	145 (max)	125 (max)
DESAT								
High desat input threshold voltage	V	8	8	8	8	8	8	8
Low desat input threshold voltage	V	7	7	7	7	7	7	7
Desat input voltage hysteresis	V	1	1	1	1	1	1	1
High DSH or DSL input bias current	μA	21	21	21	21	15	15	15
Low DSH or DSL input bias current	μA	-160	-160	-160	-160	-150	0.1	-150
DSH or DSL input bias current	mA		-20		-20	-11.1		-11.1
BRAKE								
BR output high short circuit pulsed current	mA					70	70	70
BR output low short circuit pulsed current	mA					125	125	125
BR high level output voltage	mV					6000	300	6000
BR low level output voltage	mV					3000	150	3000

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3-Phase Drivers															
	(units)	IR2130	IR2131	IR2132	IR2133	IR2135	IR2136	IR21362	IR21363	IR21365	IR21366	IR21367	IR21368	IR2233	IR2235
Offset voltage	V	600	600	600	600	600	600	600	600	600	600	600	600	1200	1200
General purpose comparator input	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hard shutdown	-	No	No	No	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes
Overcurrent shutdown (ITRIP)	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Input logic for shutdown (SD Pin)	-	No	Yes	No	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes
INPUT LOGIC															
Logic compatibility	V	2.5	2.5	2.5	2.5	2.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3	2.5	2.5
HIN, LIN	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
HIN, LIN	-							Yes							
OUTPUT															
V _{out}	V	10-20	10-20	10-20	10-20,12-20	10-20,12-20	10-20	11.5-20	12-20	12-20	12-20	12-20	10-20	10-20,12-20	10-20,12-20
Output high short circuit pulsed current	mA	200	250	200	250	250	200	200	200	200	200	200	200	250	250
Output low short circuit pulsed current	mA	420	500	420	500	500	350	350	350	350	350	350	350	500	500
UVLO															
V _{bs} UVLO positive going threshold	V	8.35	8.7	8.35	8.6	10.4	8.9	10.4	11.1	11.1	11.1	11.1	8.9	8.6	10.4
V _{bs} UVLO negative going threshold	V	7.95	8.3	7.95	8.2	9.4	8.2	9.4	10.9	10.9	10.9	10.9	8.2	8.2	9.4
V _{bs} UVLO hysteresis	V	-	-	-	0.4	1	0.7	1	0.2	0.2	-	-	-	0.4	1
V _{cc} UVLO positive going threshold	V	9	8.7	9	8.6	10.4	8.9	10.4	11.1	11.1	11.1	11.1	8.9	8.6	10.4
V _{cc} UVLO negative going threshold	V	8.7	8.3	8.7	8.2	9.4	8.2	9.4	10.9	10.9	10.9	10.9	8.2	8.2	9.4
V _{cc} UVLO lockout hysteresis	V	-	-	-	0.4	1	0.7	1	0.2	0.2	-	-	-	0.4	1
TIMING															
Turn-on propagation delay	ns	675	1300	675	750	750	425	425	425	425	250	250	425	750	750
Turn-off propagation delay	ns	425	600	425	700	700	400	400	400	400	180	180	400	700	700
Shutdown propagation delay (SD Pin)	ns		700		750	750								750	750
Turn-on rise time	ns	80	80	80	90	90	125	125	125	125	125	125	125	90	90
Turn-off rise time	ns	35	40	35	40	40	50	50	50	50	50	50	50	40	40
Delay matching, HS & LS turn-on/off (MT)	ns						40	40	40	40	40	40	40		
Dead-time	ns	2500	700	800	250	250	290	290	290	290	290	290	290	250	250
Dead-time matching (MDT)	ns						25	25	25	25	25	25	25		
ITRIP to output shutdown propagation delay	ns	660	700	660	850	850	750	750	750	750	750	750	750	850	850
ITRIP blanking time	ns	400	400	400	400	400	150	150	150	150	150	150	150	400	400
ITRIP to (FAULT) propagation delay	ns	590	700	590	650	650	600	600	600	600	600	600	600	650	650



International Rectifier's MOSFET and IGBT gate driver and current sense ICs are the simplest, smallest and lowest cost solution to drive MOSFETs or IGBTs up to 1200 V in applications up to 12 kW, and can save over 30% in part count in a 50% smaller PCB area compared to a discrete opto-coupler or transformer based solution. With the addition of few external components, IR gate driver ICs provide full driver capability with extremely fast switching speeds, designed-in ruggedness and low-power dissipation.

Gate driver IC's generate the current and voltage necessary to turn MOSFETs or IGBTs on and off from the logic output of a DSP, micro-controller or other logic device. The input is typically a 3.3 V logic-level signal. All IR gate driver ICs are CMOS compatible, and most are TTL compatible. Output currents are up to 2 A.

*IR's iMOTION (ai mo shan), representing the intelligent motion control; Motion Control Engine and Analog Signal Engine are trademarks of International Rectifier.

Half-Bridge Drivers													
	(units)	IR2103	IR2104	IR2108	IR21084	IR2109	IR21091	IR21094	IR2111	IR2183	IR21834	IR2184	IR21844
Offset voltage	V	600	600	600	600	600	600	600	600	600	600	600	600
Programmable deadtime	-	No	No	No	Yes	No	Yes	Yes	No	No	Yes	No	Yes
Hard shutdown	-	Yes	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes
Input logic for shutdown (SD Pin)	-	Yes	No	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes
INPUT LOGIC													
Logic Compatibility	V	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	3.3, 5, 15	10-20	3.3, 5	3.3, 5	3.3, 5	3.3, 5
HIN, LIN	-	Yes								Yes	Yes		
HIN, LIN	-			Yes	Yes								
HIN, LIN	-												
IN	-		Yes			Yes	Yes	Yes	Yes			Yes	Yes
OUTPUT													
V _{out}	V	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20
Output high short circuit pulsed current	mA	210	210	200	200	200	200	200	250	1900	1900	1900	1900
Output low short circuit pulsed current	mA	360	360	350	350	350	350	350	500	2300	2300	2300	2300
UVLO													
V _{bs} UVLO positive going threshold	V	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.6	8.9	8.9	8.9	8.9
V _{bs} UVLO negative going threshold	V	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
V _{bs} UVLO hysteresis	V	-	-	0.7	0.7	0.7	0.7	0.7	-	0.7	0.7	0.7	0.7
V _{cc} UVLO positive going threshold	V	8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.6	8.9	8.9	8.9	8.9
V _{cc} UVLO negative going threshold	V	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
V _{cc} UVLO lockout hysteresis	V	-	-	0.7	0.7	0.7	0.7	0.7	-	0.7	0.7	0.7	0.7
TIMING													
Turn-on propagation delay	ns	680	680	200	200	750	750	750	750	180	180	680	680
Turn-off propagation delay	ns	150	150	220	220	200	200	200	150	220	220	270	270
Shutdown propagation delay (SD Pin)	ns	160				200	615 (max)	200				180	180
Turn-on rise time	ns	100	100	150	150	150	150	150	80	40	40	40	40
Turn-off rise time	ns	50	100	50	50	50	50	50	40	20	20	20	20
Delay matching, HS & LS turn-on/off (MT)	ns	60 (max)	60 (max)			70 (max)	70 (max)	70 (max)	30	35 (max)	35 (max)	90/40	90/40
Dead-time	ns	520	520	540	540-5000	540	540-5000	540-5000	650	500	400-5000	500	400-5000
Dead-time matching (MDT)	ns			60 (max)	60-600	60 (max)	60-600	60-600		50	50-600	50	50-600

High/Low Drivers											
	(units)	IR2101	IR2106	IR21064	IR2110	IR2112	IR2113	IR2181	IR21814	IR2213	
Offset voltage	V	600	600	600	500	600	600	600	600	1200	
Hard shutdown	-	No	No	No	Yes	Yes	Yes	No	No	Yes	
Input logic for shutdown (SD Pin)	-	No	No	No	Yes	Yes	Yes	No	No	Yes	
INPUT LOGIC											
Logic Compatibility	V	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	3.3-20	
HIN, LIN	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
OUTPUT											
V _{out}	V	10-20	10-20	10-20	10-20	10-20	10-20	10-20	10-20	12.0-20	
Output high short circuit pulsed current	mA	210	200	200	2500	250	2500	1900	1900	2000	
Output low short circuit pulsed current	mA	360	350	350	2500	500	2500	2300	2300	2500	
UVLO											
V _{bs} UVLO positive going threshold	V	8.9	8.9	8.9	8.6	8.5	8.6	8.9	8.9	10.2	
V _{bs} UVLO negative going threshold	V	8.2	8.2	8.2	8.2	8.1	8.2	8.2	8.2	9.3	
V _{bs} UVLO hysteresis	V	-	0.7	0.7	-	-	-	0.7	0.7	-	
V _{cc} UVLO positive going threshold	V	8.9	8.9	8.9	8.5	8.6	8.5	8.9	8.9	10.2	
V _{cc} UVLO negative going threshold	V	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	9.3	
V _{cc} UVLO lockout hysteresis	V	-	0.7	0.7	-	-	-	0.7	0.7	-	
TIMING											
Turn-on propagation delay	ns	160	220	220	120	125	120	180	180	280	
Turn-off propagation delay	ns	150	200	200	94	105	94	220	220	225	
Shutdown propagation delay (SD Pin)	ns				110	105	110			230	
Turn-on rise time	ns	100	150	150	25	80	25	40	40	25	
Turn-off rise time	ns	50	50	50	45	40	45	20	20	17	
Delay matching, HS & LS turn-on/off (MT)	ns	50 (max)	30 (max)	30 (max)	10 (max)	30 (max)	20 (max)	35 (max)	35 (max)	30 (max)	