Solution Brief

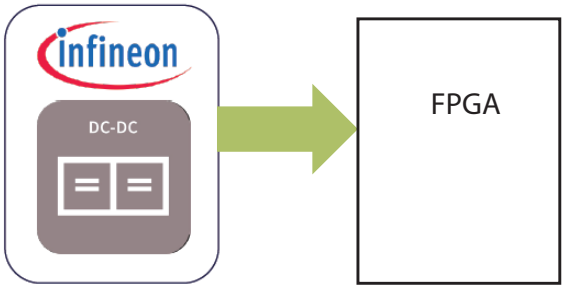
DC-DC Power Solutions for FPGAs

Infineon Power for FPGA of Altera Corporation Arria® 10 / Stratix® X 100W to 160W

Wide Selection of DC/DC power products for FPGAs

Infineon has a wide range of DC/DC power products for Altera FPGA/SoC families: Stratix, Arria, Cyclone, MAX.

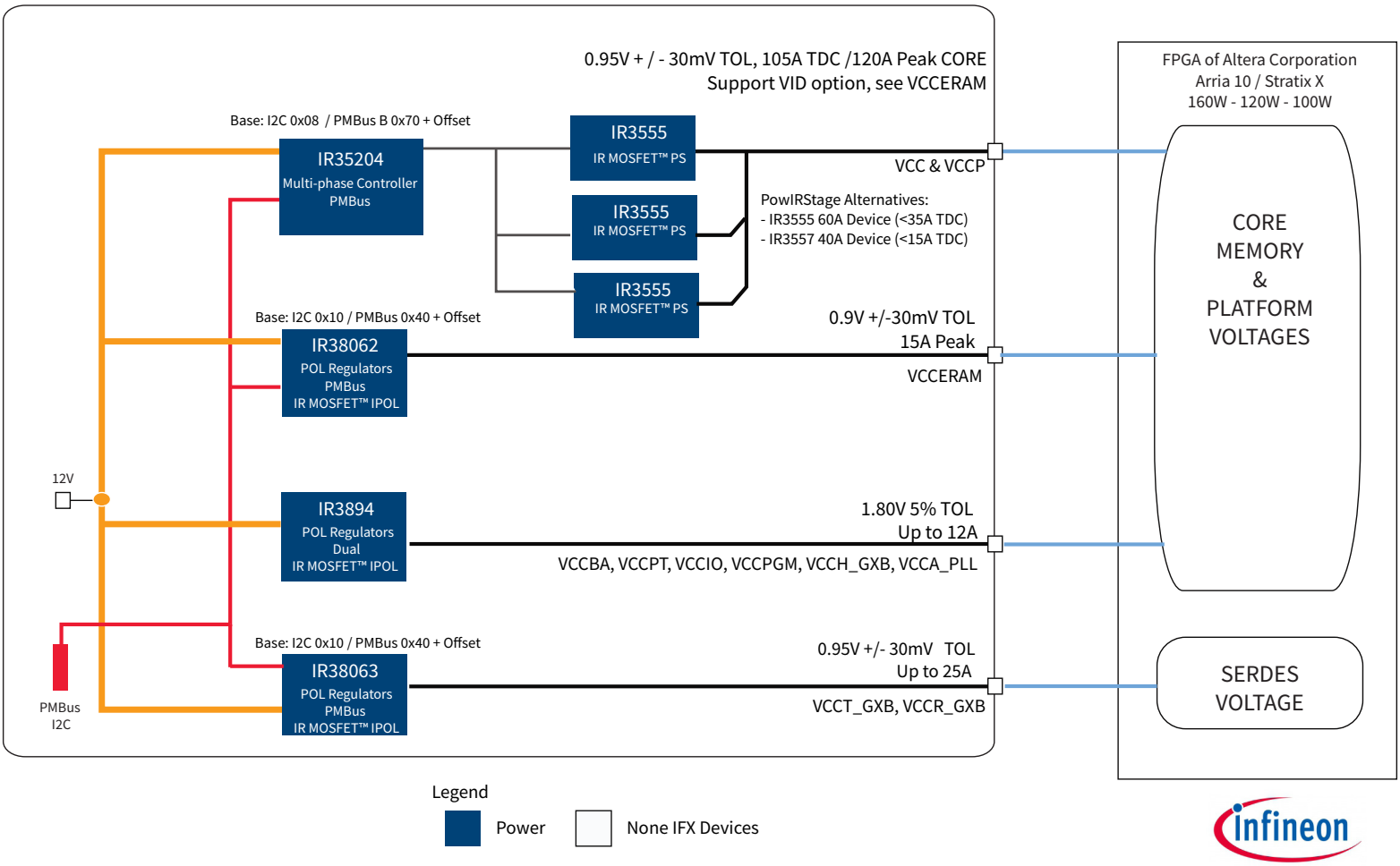
Shown below is a power design for Altera's Arria 10 & Stratix X, 100W to 160W highlighting Infineon's Point of Load and Multiphase Controller products.



Highlights

> IR35204 Multi-phase Controller. PMBus/I2C scalable design from 100W to 160W

> Integrated POL DC/DC: IR3895, IR3894, IR38063. Low noise DC/DC Voltage Regulators. Proven power designs for Platform an SERDES voltages.



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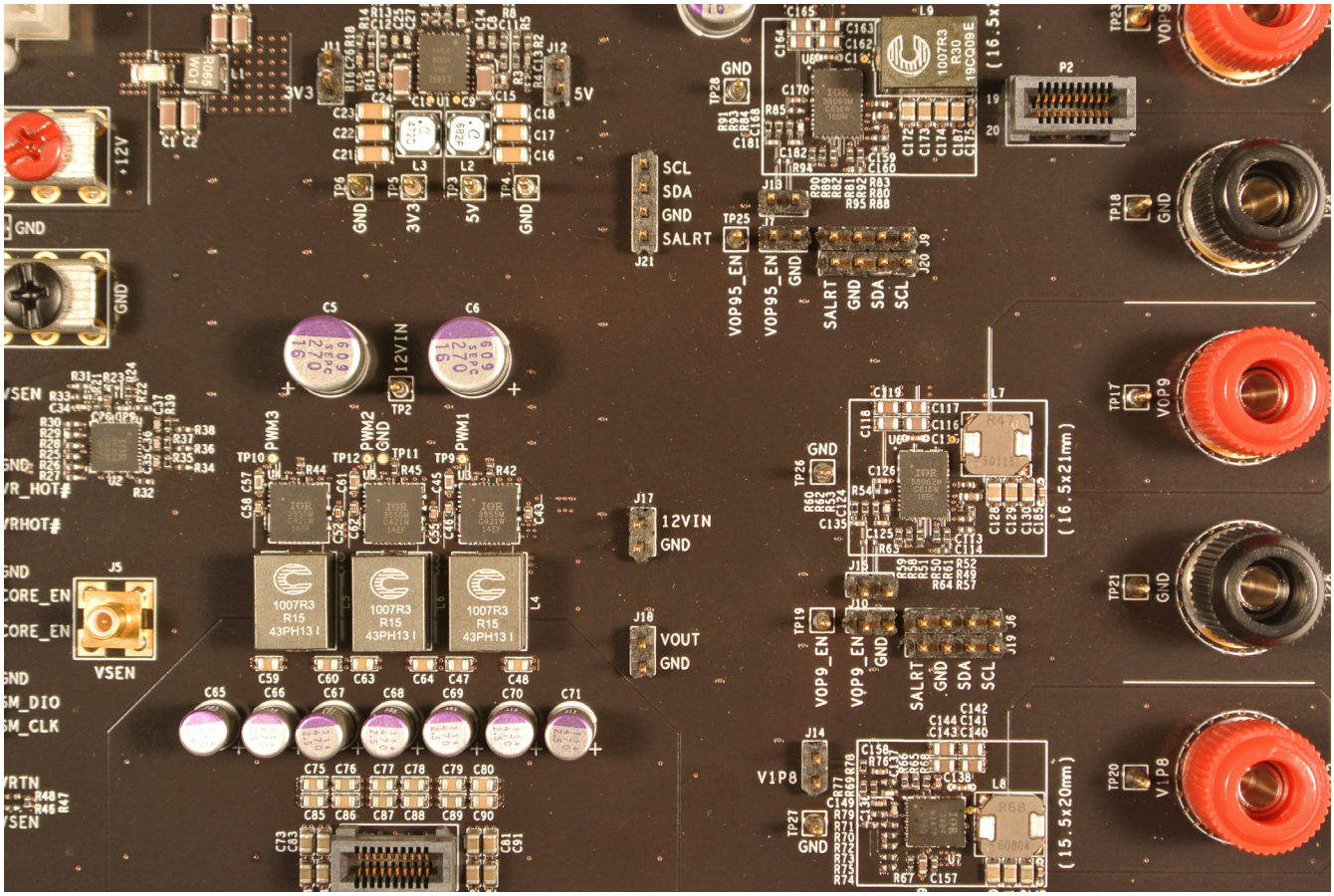
Evaluation Boards

Part	Board Number
	coming soon
IR35204MGM01TR	IRDC35204-PMAC1 (2 x IR3555, 60A+)
IR35204MGM02TR	IRDC35204-PMAC2 (3 x IR3555, 90A+)
IR35204MGM03TR	IRDC35204-PMAC3 (2 x IR3557, 30A+)
IR35204MGM04TR	IRDC35204-PMAC4 (3 x IR3557, 50A+)
IR3895	IRDC3895
IR3894	IRDC3894
IR38063	IRDC38063

Shown below IRDC35204-PMAC2 (3 x IR3555, 90A+), Power for FPGA of Altera Arria 10 / Stratix 10



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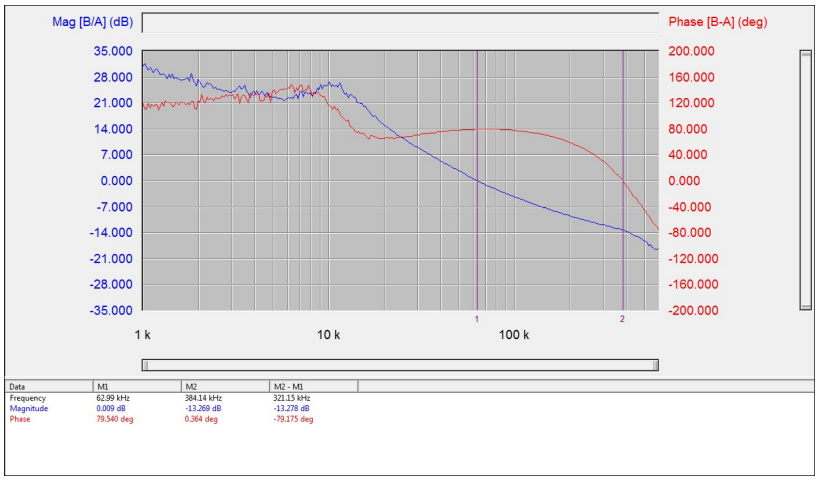
Performance Data

Core Voltage Rail (VCC, VCCP)

IR35204-V0P9 Core rail 3 Phase (IR3555)- 90A

Tested at load
0.9V / 90A

Phase Margin:79.5 deg
Bandwidth:62.9 KHz
Gain Margin:13.2 db

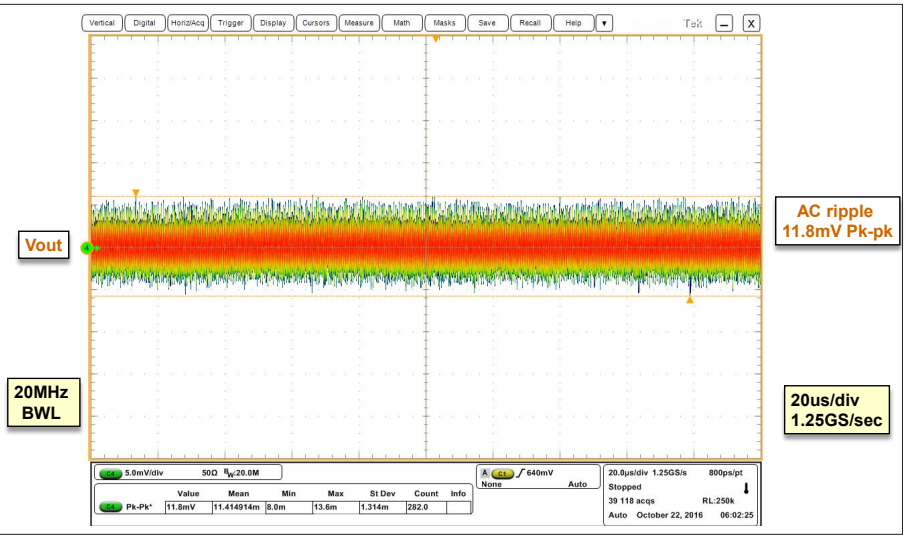


Core Voltage Rail (VCC, VCCP)

IR35204-V0P9 Core rail 3 Phase (IR3555)- 90A

Output Voltage DC-DC Ripple, 90A load

DC-DC Ripple 11.8mV Pk-pk

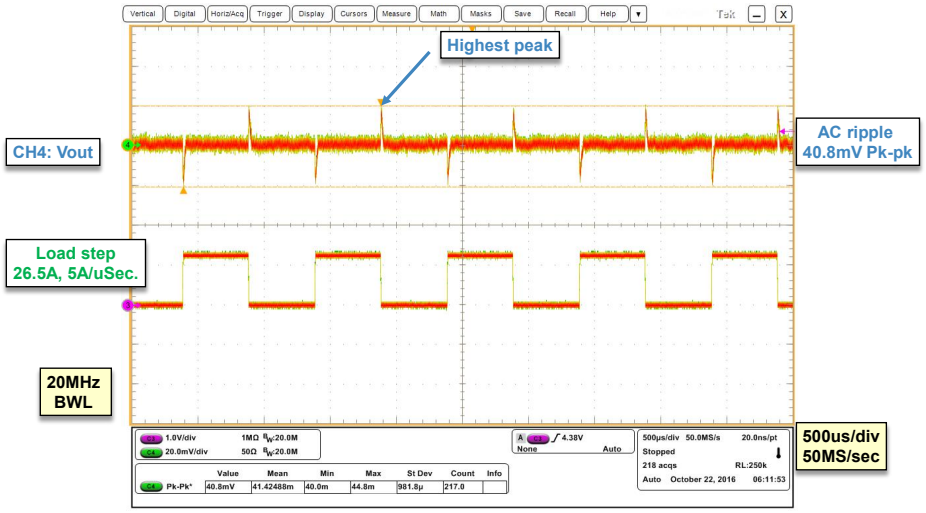


Core Voltage Rail (VCC, VCCP)

IR35204-V0P9 Core rail 3 Phase (IR3555)- 90A

Output Voltage AC Ripple,
Step Load: 26.5A, 5A/usec
Transient Response, 60A to 86.5A step

AC Ripple 40.8mV Pk-pk



DC-DC Power Solutions for FPGAs

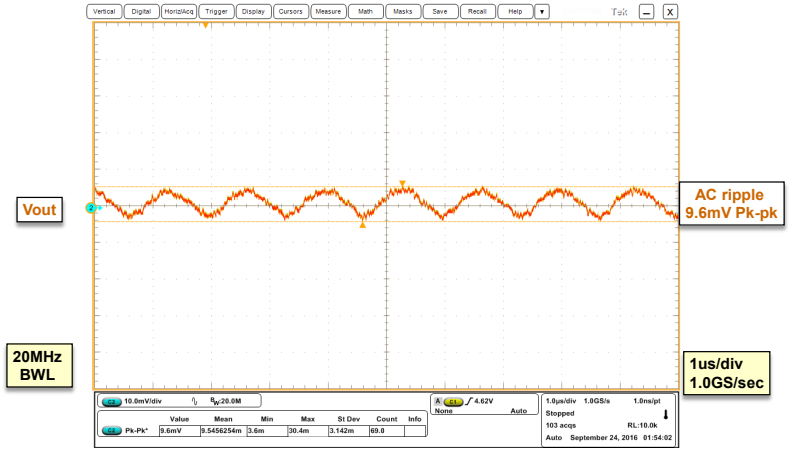
Infineon Power for FPGA of Altera Corporation Arria® 10 / Stratix® X 100W to 160W

Performance Data

SERDES Voltage Rail (VCCT_GXB, VCCR_GXB), 0.95V

IR38063-V0P95 rail DC output ripple at 25A load

DC-DC Ripple 9.6mV Pk-pk

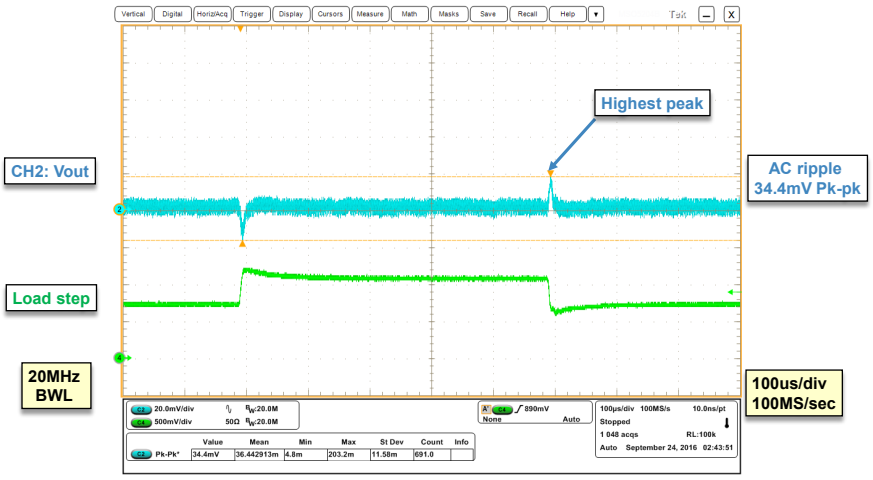


SERDES Voltage Rail (VCCT_GXB, VCCR_GXB), 0.95V

IR38063-V0P95 rail AC output ripple at 25A load

Output Voltage AC Ripple,
Step Load: 4.8A, 2.5 A/usec
Transient Response, 10A<>14.8A step

AC Ripple 34.4 mV Pk-pk

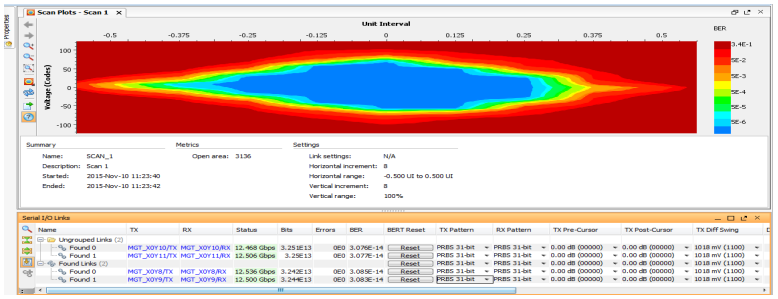


SERDES BERT Test - Eye Pattern
PRBS31 Codes

Validated IR3806x PMBus SupIRBucks

4 x 12.5Gbps lanes

Zero Bit Error



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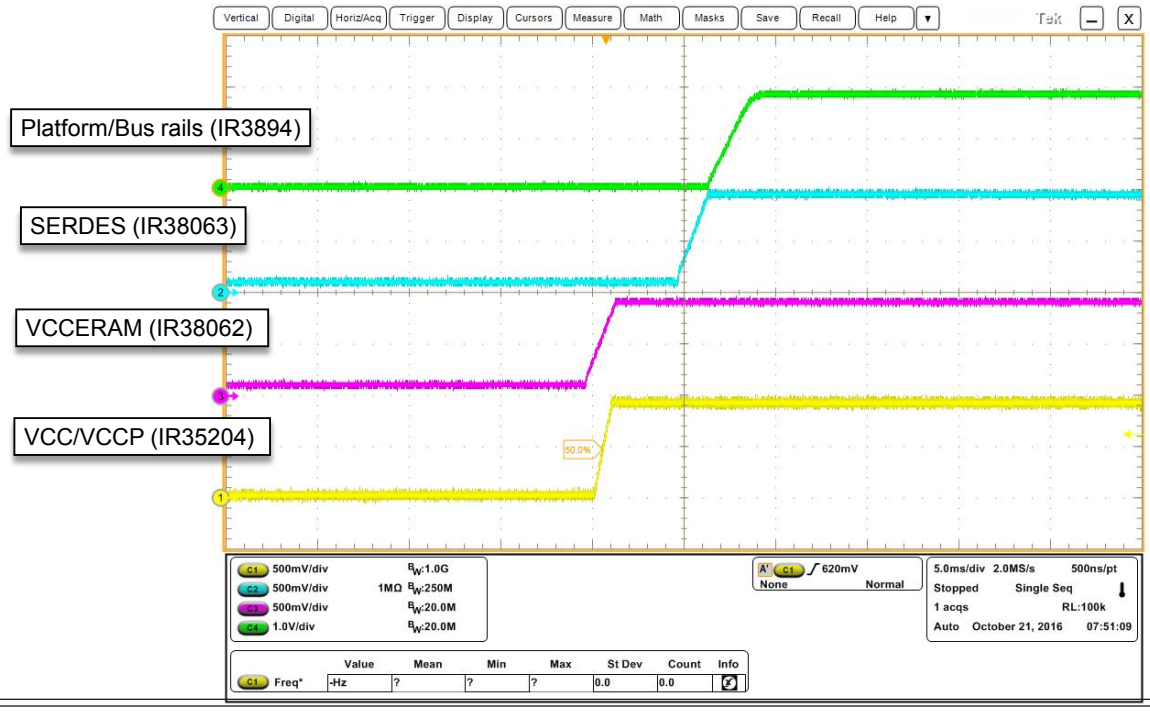
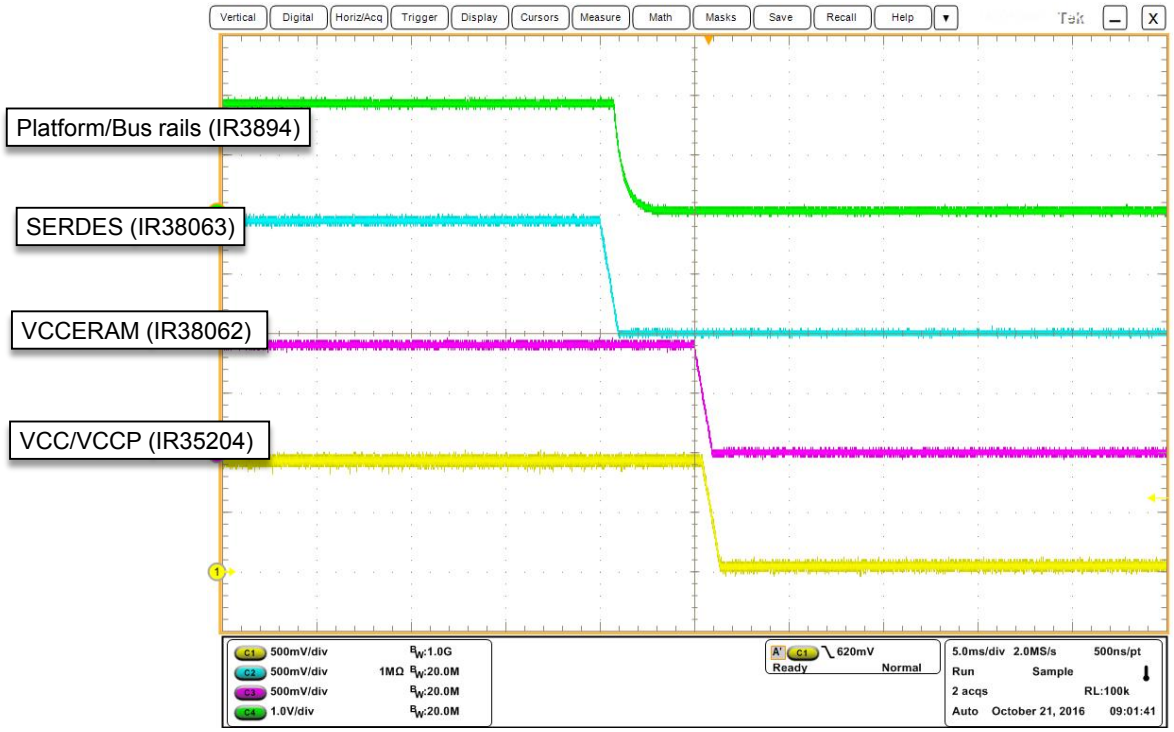
Performance Data

Infineon Solutions provides for flexible power sequencing using the combination of both hardwire enable and PMBus settable sequencing delays for each rail. Test data show is from the evaluation board, IRDC35204-PMAC2, to test the power sequencing for FPGA of Altera Arria 10 / Stratix 10

Power Sequencing ON Test



Power Sequencing OFF Test



DC-DC Power Solutions for FPGAs

Infineon Power Solutions for FPGAs of Altera Corporation

Infineon Power Solutions	FPGA Family of Altera Corporation	Power Total	Series	Product line or Ref#
IR35204 + IR355x (3), IR3891, IR38062, IR3894, IR38063	Stratix 10	100W to 160W	GX, SX	GX1100, SX1100
				GX850, SX850
IR35204 + IR355x (2), IR3891, IR38060, IR3892, IR38060		55W to 90W		GX850, SX850
				GX650, SX650
				GX500, SX500
IR38063, IR38060 (2), IR3892		40W to 50W		GX500, SX500
IR35204 + IR355x (3), IR3891, IR38062, IR3894, IR38063	Stratix V	100W to 160W	GX, SX	SXFD5
				5SGXA9
IR35204 + IR355x (2), IR3891, IR38060, IR3892, IR38060		55W to 90W		5SGXA7
				5SGXA5/490
IR38063, IR38060 (2), IR3892		40W to 50W		5SGXA5/420
				5SGSD5/457
IR38263, IRPS5401		35W to 45W		5SGXA5/420
				5SGSD5/457
IRPS5401 + IR3742, IR3883		<35W		5SGSD4/360
				5SGXA3/340
IRPS5401, IR3883		<16W		5SGSD3/236
IR38263, IRPS5401	Stratix IV	35W to 45W	GX, SX, GS	EP4SGX530
				EP4S40G5
				EP4SE530
				EP4SGX360
				EP4S100G4
				EP4SE360
IRPS5401 + IR3742, IR3883		<35W		EP4SGX290
				EP4S100G3
				EP4SGX230
				EP4SGX180
				EP4S40G2/100G2
				EP4SE230
IRPS5401, IR3883		<16W		EP4SGX110
				EP4SGX70
IR35204 + IR355x (3), IR3891, IR38062, IR3894, IR38063	Arria 10	100W to 160W	GX, SX	GX1150/10AX115
				GX900/10AX900
IR35204 + IR355x (2), IR3891, IR38060, IR3892, IR38060		55W to 90W		GX660/10AX66
				SX660/10AS66
				GX570/10AX570
				SX570/10AS570
IR38063, IR38060 (2), IR3892		40W to 50W		GX480/10AX48
				SX480/10AS48
IR38263, IRPS5401		30W to 40W		GX480/10AX48
				SX480/10AS48
				GX320/10AX32
				SX320/10AS32
				GX270/10AX27
				SX270/10AS27
IRPS5401 + IR3742, IR3883		20W to 25W		GX270/10AX27
				SX270/10AS27
				GX220/10AX22
				SX220/10AS22
				GX160/10AX16
				SX160/10AS16
IRPS5401	Arria V	20W+	GX, SX, GZ	GXFB7
				GXFB5
				GZE5
				SXFB5
				SXFD5
				GXFB3
				GZME5
Solution set 1: IR3892, IR3823, IR3823 OR Solution set 2: IR3899, IR3823 (2), IFX1763, IR3823		10W to 12W		GXFB3
				GZME5
				GXFB1
				GZME3
				SXFB3
				SXFD3
				GXFA7
				GZME1
				GXFA5
IR3823 (4)		3W to 6W		GXFA3
				GXFA1
IRPS5401 + IR3742, IR3883	Cyclone V	25W+	E, GX, GT	5CEA9/301
				5CGXC9/301
				5CGTD9/301
Solution 1: IRPS5401, IR3883 OR Solution 2: IR3898, IR3897, IR3891, IR3883		20W		5CEA7/149
				5CGXC5/149
				5CGTD7/149
				5CEA5/77
				5CGXC5/77
				5CGTD5/77
IR3891, IR3823		<14W		5CEA4/49
				5CGXC4/50
Solution 1: IRPS5401, IR3883 OR Solution 2: IR3898, IR3897, IR3891, IR3883	Cyclone IV	20W	GX, E	EP4CGX 109/150
				EP4CE / 114
				EP4CGX 50/74
				EP4CE 40/55/75
IR3891, IR3823		<14W		EP4CGX 15/22/30
				EP4CE 6/10/15/22/30

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