

C5

22uF

Link to Assembly / Mod guide http://stuff.fredcooke.com/spin1howto/spin1.html

MCU		Element14 Order Code	Schematic pages: 1, 14
MCU	Free EMS Brain	1380343 MC9S12XDP51	
R177	10K	1652909 1% 0805 Packa	
R178	10K	1652909 1% 0805 Packa	-
R179	10K	1652909 1% 0805 Packa	
R181	10K	1652909 1% 0805 Packa	
R180	10K	1652909 1% 0805 Packa	
C95	0.2uF	<u> </u>	6 ~
C94	680pF		
C93	3.8nF		
R175	3.3K		
C96	22pF	<u>1414676</u> CAPACITOR, 08	05. 22PF. 100V. NP0
	15pF	<u>=.=</u>	
	33pF		
C97	22pF	1414676 CAPACITOR, 08	05. 22PF. 100V. NP0
	15pF		
	33pF		
R176		be necessary	
		be necessary	
ХЗ	16MHz	•	3225, 16MHZ, 10PPM, 9PF
C98	0.2uF	<u> </u>	,,
C99	0.2uF		
R251		r pull up mod? <u>1809300</u> 5% 0805 Packa	ge
C100	0.2uF	· · ·	
C101	0.2uF		
C102	0.2uF		
USB	ETARADI	444C022 FTDI	Schematic pages: 15
U20	FT232RL	1146032 FTDI	OF 100NF FOV
C105	0.1uF	<u>8820120</u> CAPACITOR, 08	05, 100NF, 50V
C104	4.7uF Mounted of 100nF	l over top mod? <u>8820120</u> CAPACITOR, 08	OF 100NE FOV
R184	2K	9334084 5% 0805 Packa	
R185	Change to cap 10nF	9406352 CAPACITOR, 08	
J1	Mini usb connector	1355761 Mini USB - type	
D82	LED tx	1226390 Red 0805 pack	
D83	LED rx	1465996 Green 0805 pa	
R182	470R	1809376 5% 0805 Packa	
R183	470R	1809376 5% 0805 Packa	
MCU Po		1555741 IC DEC LDO 31	Schematic pages: 33
U2	MIC2954	1550/41 IC, REG LDO, 25	50MA, 5V, 0.5% SOT-223 Package

9229272 CAPACITOR TANT, 22UF, 35V, SMD

C6	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
D92	Schottky	<u>9556915</u> SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
C2	10uF	1617365 CAPACITOR TANT 10UF, 35V, RADIAL
C3	0.1uf	8820120 CAPACITOR, 0805, 100NF, 50V
D1	1N4007 Not needed wire jumper	

Seconda	ry Power	Schematic pages: 34
U4	LM2937	9486038 LM2937ET-5.0 IC, V REG LDO +5.0V, 2937, TO-220-3
D4	1N4007	1324152 DIODE, STANDARD, 1A, 1000V, DO-41
C8	10uF	1617365 CAPACITOR TANT 10UF, 35V, RADIAL
C9	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
C10	22uF	9229272 CAPACITOR TANT , 22UF, 35V, SMD
C11	10uF	1617365 CAPACITOR TANT 10UF, 35V, RADIAL
C12	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
Q19	Shutdown circuit design flawed do not use	
Q18	Shutdown circuit design flawed do not use	
R227	Shutdown circuit design flawed do not use	
R226	Shutdown circuit design flawed do not use	
D3	1N4007	
R2	Not needed wire jumper too U4	

Battery Vo	oltage Reference	Schematic pages: 53
R105	3.9K	1887296 1% 0805 Package
R106	1K	<u>1506077</u> 0.1% 0805 Package
R52	Error on pcb> Jumper	<u>1809596</u> 0805 Jumper
C31	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
D36	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
D35	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
R49	470R	<u>1809376</u> 5% 0805 Package

Manifold Absolute Pressure		Schematic pages: 1, 44, 47	
U6	MPX4250A	<u>1457153</u> Pressure Sensor with Barb <u>Mouser 841-MPX4250AP</u>	
C23	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V	
C24	47pF	1759199 MLCC, 0805, NP0, 50V, 47PF	
C66	0.22uF	<u>1759172</u> MLCC, 0805, X7R, 25V, 220NF	
R134	470R	<u>1809376</u> 5% 0805 Package	
R50	Jumper	<u>1809596</u> 0805 Jumper	
R47	Jumper	<u>1809596</u> 0805 Jumper	
D31	Not used no connection		
D32	Not used no connection		
C29	Not used no connection		

Off Boar	Off Board Manifold Air Pressure (Use this and NOT the above if you plan on having off board MAP sensor: ie OEM MAP)				
U6	MPX4250A	1457153 Pressure Sensor with Barb Mouser 841-MPX4250AP			
C23	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V			
C24	47pF	<u>1759199</u> MLCC, 0805, NPO, 50V, 47PF			
C66	0.22uF	1759172 MLCC, 0805, X7R, 25V, 220NF			
R134	470R	<u>1809376</u> 5% 0805 Package			
R51	Jumper	<u>1809596</u> 0805 Jumper			
R48	Jumper	<u>1809596</u> 0805 Jumper			
D33	Schotty	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123			
D34	Schotty	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123			
C29	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V			

Atmosphe	eric Absolute Pressure	Schematic pages: 1, 43, 47
U5	MPX4100A	1555602 Presure sensor No barb, No Tabs 1703477 Barbed, No Tabs
C21	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
C20	47pF	<u>1759199</u> MLCC, 0805, NP0, 50V, 47PF
C19	Not used no connection	
R51	470R	<u>1809376</u> 5% 0805 Package
C29	0.22uF	<u>1759172</u> MLCC, 0805, X7R, 25V, 220NF
R48	Jumper	
D33	Not used no connection	
D34	Not used no connection	<u>1809596</u> 0805 Jumper
C30	Not used no connection	

Atmospheric Absolute Pressure (Use this and NOT the above you plan on having off board AAP sensor : ie OEM AAP)			
U5	MPX4100A	1555602 Presure sensor No barb, No Tabs 1703477 Barbed, No Tabs	
C21	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V	
C20	47pF	<u>1759199</u> MLCC, 0805, NP0, 50V, 47PF	
C19	Not used no connection		
R51	470R	<u>1809376</u> 5% 0805 Package	
C29	0.22uF	<u>1759172</u> MLCC, 0805, X7R, 25V, 220NF	
R48	Jumper	<u>1809596</u> 0805 Jumper	
D33	Schotty	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123	
D34	Schotty	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123	
C30	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V	

RPM - VI	R Input 1		Schematic pages: 18, 45	
U29	MAX992	24	1845719 No Longer Stocked by Element14 Mouser NZ 700-MAX9924UA	AUB
R214	10K		<u>1652909</u> 1% 0805 Package	
C126	0.1uF		8820120 CAPACITOR, 0805, 100NF, 50V	
C125	1nF		<u>1414659</u> CAPACITOR, 0805, 1NF, 200V, X7R	
R212	10K	1/4watt	<u>1618242</u> 5% 0805 Package, 1/4W	
R213	10K	1/4watt	<u>1618242</u> 5% 0805 Package, 1/4W	
RPM - VI	R Input 2		Schematic pages: 17, 46	
RPM - VI	R Input 2 MAX992	24	Schematic pages: 17, 46 1845719 No Longer Stocked by Element14 Mouser NZ 700-MAX9924UA	<u>AUB</u>
	•	24		<u>AUB</u>
U30	MAX992	24	1845719 No Longer Stocked by Element14 Mouser NZ 700-MAX9924UA	<u>AUB</u>
U30 R217	MAX992 10K	24	<u>1845719</u> No Longer Stocked by Element14 Mouser NZ <u>700-MAX9924UA</u> <u>1652909</u> 1% 0805 Package	<u>NUB</u>
U30 R217 C128	MAX992 10K 0.1uF	1/4watt	1845719 No Longer Stocked by Element14 Mouser NZ 700-MAX9924UA 1652909 1% 0805 Package 8820120 CAPACITOR, 0805, 100NF, 50V	<u>NUB</u>
U30 R217 C128 C127	MAX992 10K 0.1uF 1nF		1845719 No Longer Stocked by Element14 Mouser NZ 700-MAX9924UA 1652909 1% 0805 Package 8820120 CAPACITOR, 0805, 100NF, 50V 1414659 CAPACITOR, 0805, 1NF, 200V, X7R	<u>NUB</u>

Fuel Pump note this is on sheet 51 of schematics "general_drive1.sch"				
Q8	Mosfet_N Channel	<u>1017798</u> MOSFET, N, LOGIC, TO-220		
D46	LED	<u>1465996</u> Green 0805 package		
R67	2.4K	<u>1809376</u> 5% 0805 Package		
R66	100K	<u>1809303</u> 5% 0805 Package		
R65	1K	<u>1809300</u> 5% 0805 Package		
R68	Not used no connection			
C37	Not used no connection			

Coolant/Head Temperature		Schematic pages: 1, 48, 55
C75	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
R149	470R	<u>1809376</u> 0805 Package
C74	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
R160	jumper	<u>1809596</u> 0805 Jumper
R164	jumper	<u>1809596</u> 0805 Jumper
D60	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
D61	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
R147	2.4K	<u>1887290</u> 1% 0805 Package
C73	Not used no connection	
C86	Not used no connection	
R148	Not used no connection	

Manifold	d Air Temperature	Schematic pages: 1, 24, 26
C81	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
R155	470R	<u>1809376</u> 0805 Package
C74	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
R170	jumper	<u>1809596</u> 0805 Jumper
R174	jumper	<u>1809596</u> 0805 Jumper
D72	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
D73	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
R153	2.4K	<u>1887290</u> 1% 0805 Package
C79	Not used no connection	
R154	Not used no connection	
C92	Not used no connection	

Intake Air Temperature		Schematic pages: 1, 48, 56
C78	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
R152	470R	<u>1809376</u> 0805 Package
C77	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V
R159	jumper	<u>1809596</u> 0805 Jumper
R163	jumper	<u>1809596</u> 0805 Jumper
D58	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
D59	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123
R150	2.4K	<u>1887290</u> 1% 0805 Package
C76	Not used no connection	
R151	Not used no connection	
C85	Not used no connection	

Throttle Position Sensor		Schematic pages: 1, 48			
R173	470R	<u>1809376</u> 0805 Package			
C91	0.1uF	8820120 CAPACITOR, 0805, 100NF, 50V			
D71	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123			
D70	Schottky	9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123			

ector 1		Schematic pages	1, 27	
03	1K	1809300 5% 0805 Package		
57	2.4K	<u>1809376</u> 0805 Package		
10	LED	1465996 Green 0805 package		
9	Not used no connection YET	Option A	Option B	
.5	VNB10N07	686-8518P RS components VNP10N07 Omnifet	511-VNP14NV04-E	Mouser N-Ch 40V 14A OmniFET
18	Change to R=100K and mod to ground of	on pin 3 of u26 when not using "Peak and Hold" Circuit>		
	_	· -	•	
ector 2		Schematic pages	1, 28	
00	1K	<u>1809300</u> 5% 0805 Package		
56	2.4K	<u>1809376</u> 0805 Package		
09	LED	1465996 Green 0805 package		
8	Not used no connection YET	Option A	Option B	
4	VNB10N07	686-8518P RS components VNP10N07 Omnifet	511-VNP14NV04-E	Mouser N-MOSFET, N, LOGIC, TO-220
16	Change to R=100K and mod to ground of	on pin 3 of u25 when not using "Peak and Hold" Circuit>	May not be needed	
	_		•	
ctor 3		Schematic pages	1, 29	
97	1K	1809300 5% 0805 Package		
55	2.4K	1809376 0805 Package		
08	LED	1465996 Green 0805 package		
7	Not used no connection YET	Option A	Option B	
3	VNB10N07	686-8518P RS components VNP10N07 Omnifet	511-VNP14NV04-E	Mouser N-MOSFET, N, LOGIC, TO-220
	al . p. 4004 . l . l .		May not be needed	
14	Change to R=100K and mod to ground (on pin 3 of u24 when not using "Peak and Hold" Circuit>	iviay not be needed	
14	Change to R=100K and mod to ground o	on pin 3 of u24 when not using "Peak and Hold" Circuit>	way not be needed	
		on pin 3 of u24 when not using "Peak and Hold" Circuit> Schematic pages	·	
ector 4		· -	·	
ector 4 94		Schematic pages	·	
ector 4 94 54	1K	Schematic pages 1809300 5% 0805 Package	·	
ector 4 94 54 97	1K 2.4K	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package	·	
ector 4 94 54 07	1K 2.4K LED	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package	1, 30	Mouser N-MOSFET, N, LOGIC, TO-220
ector 4 94 54 07 6	1K 2.4K LED Not used no connection YET VNB10N07	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A	1, 30 Option B 511-VNP14NV04-E	Mouser N-MOSFET, N, LOGIC, TO-220
octor 4 94 64 07	1K 2.4K LED Not used no connection YET VNB10N07	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet	1, 30 Option B 511-VNP14NV04-E	Mouser N-MOSFET, N, LOGIC, TO-220
ector 4 94 54 07 6 2	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet	Option B 511-VNP14NV04-E May not be needed	Mouser N-MOSFET, N, LOGIC, TO-220
ector 4 94 54 07 6 2 12	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package	Option B 511-VNP14NV04-E May not be needed	Mouser N- MOSFET, N, LOGIC, TO-220
ector 4 94 54 07 6 2 12 ector 5	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages	Option B 511-VNP14NV04-E May not be needed	Mouser N- MOSFET, N, LOGIC, TO-220
ector 4 94 64 97 6 2 2 ector 5	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package	Option B 511-VNP14NV04-E May not be needed	Mouser N-MOSFET, N, LOGIC, TO-220
ector 4 94 54 07 6 2 12 ector 5 91 53	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package	Option B 511-VNP14NV04-E May not be needed	Mouser N-MOSFET, N, LOGIC, TO-220
ector 4 94 54 07 6 2 12 ector 5 91 53 06	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED	\$\frac{1809300}{1809376}\$ 0805 Package \$\frac{1809376}{1809376}\$ 0805 Package \$\frac{1465996}{1465996}\$ Green 0805 package Option A \$\frac{686-8518P}{686-8518P}\$ RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> \$\frac{1809300}{5}\$ 5% 0805 Package \$\frac{1809376}{1809376}\$ 0805 Package \$\frac{1809376}{1465996}\$ Green 0805 package	Option B 511-VNP14NV04-E May not be needed 1, 31	Mouser N-MOSFET, N, LOGIC, TO-220 Mouser N-MOSFET, N, LOGIC, TO-220
ector 4 94 54 07 6 2 12 ector 5 91 53 06 5	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E	
ector 4 94 54 07 6 2 12 ector 5 91 53 06 5	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07	\$\frac{1809300}{1809376}\$ 5% 0805 Package \$\frac{1809376}{1465996}\$ Green 0805 package Option A \$\frac{686-8518P}{2}\$ RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> \$\frac{1809300}{2}\$ 5% 0805 Package \$\frac{1809376}{2}\$ 0805 Package \$\frac{1809376}{2}\$ Green 0805 package Option A \$\frac{686-8518P}{2}\$ RS components VNP10N07 Omnifet	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E	
ector 4 94 54 07 5 2 2 2 2 2 3 3 06 5 1	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	\$\frac{1809300}{1809376}\$ 5% 0805 Package \$\frac{1809376}{1465996}\$ Green 0805 package Option A \$\frac{686-8518P}{2}\$ RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> \$\frac{1809300}{2}\$ 5% 0805 Package \$\frac{1809376}{2}\$ 0805 Package \$\frac{1809376}{2}\$ Green 0805 package Option A \$\frac{686-8518P}{2}\$ RS components VNP10N07 Omnifet	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E May not be needed	
ector 4 94 54 07 5 12 ector 5 91 53 06 5 1	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u22 when not using "Peak and Hold" Circuit>	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E May not be needed	
ector 4 94 54 07 6 2 12 ector 5 91 53 06 5 1 10	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1809376 Green 0805 package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u22 when not using "Peak and Hold" Circuit> Schematic pages	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E May not be needed	
ector 4 94 54 07 6 2 12 ector 5 91 53 06 5 1 10	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u22 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E May not be needed	
ector 4 94 54 07 6 2 112 91 53 06 5 1 10 ector 6 88 52 05	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K	1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package 0ption A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1465996 Green 0805 package 1465996 Green 0805 package 0ption A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u22 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 180	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E May not be needed	
ector 4 94 54 07 6 2 12 ector 5 91 53 06 5 1 10 ector 6 88 52 05	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u22 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1809376 0805 Package 1809376 0805 Package 1465996 Green 0805 package 1465996 Green 0805 package Option A Option A Green 0805 package 1465996 Green 0805 package Option A Opt	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E May not be needed 1, 32	
ector 4 94 54 07 6 2 12 ector 5 91 53 06 5 1 10 ector 6 88 52 05	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 The connection YET VNB10N07	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u22 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 OROS Package	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E May not be needed 1, 32 Option B 511-VNP14NV04-E	Mouser N-MOSFET, N, LOGIC, TO-220
ector 4 94 54 07 6 2 12 ector 5 91 53 06 5 1 10 ector 6 88 52 05 4	1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 Change to R=100K and mod to ground of 1K 2.4K LED Not used no connection YET VNB10N07 The connection YET VNB10N07	Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u23 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1465996 Green 0805 package Option A 686-8518P RS components VNP10N07 Omnifet on pin 3 of u22 when not using "Peak and Hold" Circuit> Schematic pages 1809300 5% 0805 Package 1809376 0805 Package 1809376 0805 Package 1809376 0805 Package 1465996 Green 0805 package 1465996 Green 0805 package Option A Option A Green 0805 package 1465996 Green 0805 package Option A Opt	Option B 511-VNP14NV04-E May not be needed 1, 31 Option B 511-VNP14NV04-E May not be needed 1, 32 Option B 511-VNP14NV04-E	Mouser N-MOSFET, N, LOGIC, TO-220

R206	1K	<u>1809300</u> 5% 0805 Package		
R258	2.4K	<u>1809376</u> 0805 Package		
D111	LED	1465996 Green 0805 package		
D90	Not used no connection YET	Option A	Option B	
Q16	VNB10N07	686-8518P RS components VNP10N07 Omnifet	511-VNP14NV04-E	Mouser N-MOSFET, N, LOGIC, TO-220
C120	Change to R=100K and mod to ground on pir	a 3 of u20 when not using "Peak and Hold" Circuit> May	not be needed	
	_			
Injector 8		Schematic pages: 1, 1	19	

Injector 8	3	Schematic pages: 1	1, 19		
R209	1K	<u>1809300</u> 5% 0805 Package			
R259	2.4K	<u>1809376</u> 0805 Package			
D112	LED	1465996 Green 0805 package			
D91	Not used no connection YET	Option A	Option B		
Q17	VNB10N07	686-8518P RS components VNP10N07 Omnifet	511-VNP14NV04-E	Mouser N-MOSFET, N, LOGIC, TO-220	
C122	Change to R=100K and mod to ground on pin 3 of u19 when not using "Peak and Hold" Circuit> May not be needed				

XOR logic			Schematic pages: 1	
R230	1K		<u>1809300</u> 5% 0805 Package	
R231	1K		1809300 5% 0805 Package	
R232	1K		1809300 5% 0805 Package	
R233	1K		1809300 5% 0805 Package	
R228	10K		1652909 1% 0805 Package	
R229	10K		1652909 1% 0805 Package	
124	0.1uF		8820120 CAPACITOR, 0805, 100NF, 50V	
J33	XOR Gate		1740035 LOGIC, QUAD 2-IN EX-OR GATE , 14SOIC	
J33	AUR Gale		1740055 LOGIC, QUAD 2-IN EX-OR GATE, 1450IC	
R Mod 10	00k pulldowr	n 14 x	9342427 1% Resistor, MF12 Package < will fit through	n via's
gnition 1			Schematic pages: 1, 35	5, 42
29	2K	(Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package	
20	LED		<u>1686068</u> LED, SMD, 0805, ORANGE	
			Option A	Option B
24	Mosfet_N	Channel	686-8518P RS components VNP10N07 Omnifet	686-8518P RS components VNP10N07 Omnifet
R 7	Jumper		<u>1809596</u> 0805 Jumper	
30	100K		1809303 5% 0805 Package	
27	1K		1809300 5% 0805 Package	
10	Schottky		9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123	
79	Internal in	Mosfet		
7	Not used			
10	Not used			
710	Not useu			
gnition 2			Schematic pages: 1, 36	5, 41
	2K	(Avaliblity - 2k used instead of 2.4	, ,	5, 41
25		(Avaliblity - 2k used instead of 2.4	, ,	5, 41
25	2K	(Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package	Option B
225 019	2K LED		9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A	Option B
225 019 Q3	2K LED Mosfet_N		9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet	
225 919 Q3	2K LED Mosfet_N Jumper		9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper	Option B
25 19 23 9	2K LED Mosfet_N Jumper 100K		9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package	Option B
25 019 03 9 26 23	2K LED Mosfet_N Jumper 100K 1K		9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package	Option B
25 019 03 9 26 23	2K LED Mosfet_N Jumper 100K 1K Schottky	Channel	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package	Option B
225 019 03 89 826 823 012	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in	Channel	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package	Option B
225 019 023 89 826 823 012	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used	Channel	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package	Option B
25 119 23 9 26 23 212	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in	Channel	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package	Option B
225 019 023 89 826 823 012 078 89 012	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used	Channel Mosfet	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123	Option B 686-8518P RS components VNP10N07 Omnifet
gnition 2 325 019 03 39 326 323 012 078 89 012 gnition 3	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used	Channel	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37	Option B 686-8518P RS components VNP10N07 Omnifet
225 019 03 29 226 223 012 078 29 012	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used	Channel Mosfet	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123	Option B 686-8518P RS components VNP10N07 Omnifet
225 019 03 29 226 223 012 078 29 012	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used	Channel Mosfet	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37	Option B 686-8518P RS components VNP10N07 Omnifet
225 019 03 29 226 223 012 078 9 012 gnition 3	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used	Channel Mosfet (Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37	Option B 686-8518P RS components VNP10N07 Omnifet
225 019 03 29 226 223 012 078 29 012 gnition 3 221 018	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used 2K LED Mosfet_N	Channel Mosfet (Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37 9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A	Option B 686-8518P RS components VNP10N07 Omnifet 7, 40 Option B
225 019 03 9 226 223 012 078 9 012 gnition 3 221 018	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used 2K LED Mosfet_N Jumper	Channel Mosfet (Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37 9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper	Option B 686-8518P RS components VNP10N07 Omnifet 7, 40 Option B
225 019 03 89 826 823 012 078 89 012 018	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used 2K LED Mosfet_N Jumper 100K	Channel Mosfet (Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37 9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package	Option B 686-8518P RS components VNP10N07 Omnifet 7, 40 Option B
225 019 03 9 226 223 012 078 9 012 gnition 3 221 018	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used 2K LED Mosfet_N Jumper 100K 1K	Channel Mosfet (Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37 9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package	Option B 686-8518P RS components VNP10N07 Omnifet 7, 40 Option B
225 219 23 29 326 323 2012 2078 39 2012 2018 21 21 21 22 311 322 319 2014	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used 2K LED Mosfet_N Jumper 100K 1K Schottky	Channel Mosfet (Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37 9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package	Option B 686-8518P RS components VNP10N07 Omnifet 7, 40 Option B
25 119 23 9 26 23 112 78 9 112 gnition 3 21 118 22 11	2K LED Mosfet_N Jumper 100K 1K Schottky Internal in Not used Not used 2K LED Mosfet_N Jumper 100K 1K	Channel Mosfet (Avaliblity - 2k used instead of 2.4	9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package 9556915 SCHOTTKY RECTIFIER, 500mA, 20V, SOD-123 Schematic pages: 1, 37 9334084 5% 0805 Package 1686068 LED, SMD, 0805, ORANGE Option A 686-8518P RS components VNP10N07 Omnifet 1809596 0805 Jumper 1809303 5% 0805 Package 1809300 5% 0805 Package	Option B 686-8518P RS components VNP10N07 Omnifet 7, 40 Option B

D77 Internal in Mosfet

ignition 4		Schematic pages: 1, 38, 39				
R17	2K	(Avaliblity - 2k used instead of 2.4	9334084 5% 0805	Package		
D17	LED		1686068 LED, SMI	D, 0805, ORANGE		
			Option A		Option	В
Q1			686-8518P RS comp	onents VNP10N07 Omnifet	<u>686-85</u>	18P RS components VNP10N07 Omnifet
R13	Jumper		1809596 0805 Jun	nper		
R18	100K		<u>1809303</u> 5% 0805	Package		
R15	1K		<u>1809300</u> 5% 0805	Package		
D16	Schottky		9556915 SCHOTTI	(Y RECTIFIER, 500mA, 20V, SO	D-123	
R13	Not used					
D16	Not used					
D76	Internal in	Mosfet				