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MCU Scout

Issue February 2007

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78K 8-/16-bit Microcontrollers

Issue February 2007

Device			Memory			Interfaces				Timers				Additional Peripherals			Miscellaneous Information						
Core	Nickname	Part Number	Size [KB]	Type	RAM [Byte]	I/O Lines	CSI/UART/s	CAN I2C	External Bus	Channels	PWMs	External Oscillator (MHz)	Internal Oscillator (kHz)	LCD	A/D / D/A-Converter	Supply Voltage [V]	Pins	Packages	Qualification*	Other Features**	OCD	In-Circuit Emulator
78K0S K Series	78K0S/KU1+	µPD78F9200	1	Flash	128	8	–/–	–	–	3	1 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	–	4 x 10-bit/ –	2.0 – 5.5	10	MA-CAC-A	STD	LVI, POC, SVF	√	QB-78K0SKX1-ZZZ-EE
		µPD78F9201	2																			
		µPD78F9202	4																			
	78K0S/KY1+	µPD78F9210	1	Flash	128	14	–/–	–	–	3	1 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	–	4 x 10-bit/ –	2.0 – 5.5	16	GR-JJG-A, FH-2A2-A	STD (A), (A2)	LVI, POC, SVF	√	
		µPD78F9211	2																			
		µPD78F9212	4																			
	78K0S/KA1+	µPD78F9221	2	Flash	128 256	17	–/1	–	–	4	1 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	–	4 x 10-bit/ –	2.0 – 5.5	20	MC-5A4-A, MCCAA4X(A), (A2)	STD (A), (A2)	LIN, LVI, POC, SVF	√	
		µPD78F9222	4																			
	78K0S/KB1+	µPD78F9232	4	Flash	256	26	–/1	–	–	4	1 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	–	4 x 10-bit/ –	2.0 – 5.5	30	MC-5A4-A, MCGB4X(A), (A2)	STD (A), (A2)	LIN, LVI, POC, SVF	√	
		µPD78F9234	8																			
	NEW 78K0S/KU1+	µPD78F9500	1	Flash	128	8	–/–	–	–	2	1 x 8-bit	10	8 MHz, 240 kHz	–	–	2.0 – 5.5	10	MA-CAC-A	STD	LVI, POC, SVF	√	
		µPD78F9501	2																			
		µPD78F9502	4																			
	NEW 78K0S/KY1+	µPD78F9510	1	Flash	128	14	–/–	–	–	3	1 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	–	–	2.0 – 5.5	16	GR-JJG-A, FH-2A2-A	STD (A), (A2)	LVI, POC, SVF	√	
		µPD78F9511	2																			
		µPD78F9512	4																			
	NEW 78K0S/KA1+	µPD78F9521	2	Flash	128 256	17	–/1	–	–	4	1 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	–	–	2.0 – 5.5	20	MC-5A4-A, MCAA4X(A), (A2)	STD (A), (A2)	LIN, LVI, POC, SVF	√	
		µPD78F9522	4																			
	NEW 78K0S/KB1+	µPD78F9532	4	Flash	256	26	–/1	–	–	4	1 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	–	–	2.0 – 5.5	30	MC-5A4-A, MCGB4X(A), (A2)	STD (A), (A2)	LIN, LVI, POC, SVF	√	
		µPD78F9534	8																			
78K0 L Series	78K0/LE2	µPD78F0361	16	Flash	768 1024	24	1/2	–	√	7	4x8-bit, 2x16-bit	20	8 MHz, 240 kHz	√	20 x 4	1.8 – 5.5	64	GB-UEU-A, GK-UET-A	STD	LIN, LVI, POC, RTC, SVF, WW, MCG, BUZ	– √	QB-78K0LX2-ZZZ-EE
		µPD78F0362	24																			
		µPD78F0363	32																			
		µPD78F0363D																				
	78K0/LF2	µPD78F0372	24	Flash	1024 2048 3072 5120 1024 2048 3072 5120	34 26	1/2	–	√	7 8 7 8	4 x 8-bit, 1 x 16-bit 4 x 8-bit, 2 x 16-bit 4 x 8-bit, 1 x 16-bit 4 x 8-bit, 2 x 16-bit	20	8 MHz, 240 kHz	√	26 x 4 36 x 4	1.8 – 5.5	80	GK-8EU-A, GC-UET-A	STD	LIN, LVI, POC, RTC, SVF, WW	– √ –	
		µPD78F0373	32																			
		µPD78F0374	48																			
		µPD78F0375	60																			
		µPD78F0376	96																			
		µPD78F0376D																				
		µPD78F0382	24																			
		µPD78F0383	32																			
		µPD78F0384	48																			
		µPD78F0385	60																			
		µPD78F0386	96																			
		µPD78F0386D																				
	78K0/LG2	µPD78F0393	32	Flash	1024 2048 3072 5120 7168	40	1/2 2/2	–	√	7 8	4x8-bit, 1x16-bit 4 x 8-bit, 2 x 16-bit	20	8 MHz, 240 kHz	√	40 x 4	1.8 – 5.5	100	GC-8EA-A, GF-JBT-A	STD	LIN, LVI, POC, SVF, WW	– √	
		µPD78F0394	48																			
		µPD78F0395	60																			
		µPD78F0396	96																			
		µPD78F0397	128																			
		µPD78F0397D																				
	NEW 78K0/LC3	µPD78F0400	8	Flash	512 768 1024 1024 2048 3072 5120	26	–/2	–	–	9	2 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	√	22 x 4, 18 x 8	1.8 – 5.5	48	GA-GAM-AX	STD	LVI, LIN, POC, RTC, RCR, SVF, WW, MCG, BUZ	√	
		µPD78F0401	16																			
		µPD78F0402	24												–/–							
		µPD78F0403	32																			
		µPD78F0410	8												6 x 10-bit/ –							
		µPD78F0411	16																			
		µPD78F0412	24																			
		µPD78F0413	32																			
	NEW 78K0/LD3	µPD78F0420	8	Flash	512 768 1024 1024 512 768 1024	34	1/2	–	–	9	2 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	√	24 x 4, 20 x 8 6 x 10-bit/ –	1.8 – 5.5	52	GB-GAG-AX	STD	LVI, LIN, POC, RTC, RCR, SVF, WW, MCG, BUZ	√	
		µPD78F0421	16																			
		µPD78F0422	24												–/–							
		µPD78F0423	32																			
		µPD78F0430	8																			
		µPD78F0431	16																			
		µPD78F0432	24																			
		µPD78F0433	32																			
	NEW 78K0/LE3	µPD78F0441	16	Flash	768 1024 2048 768 1024 2048 768 1024 2048	46	1/2	–	–	9	4 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	√	32 x 4, 28 x 8 8 x 10-bit/ – 8 x 10-bit, 3 x 16-bit/	1.8 – 5.5	64	GB-GAH-AX GK-GAJ-AX	STD	LVI, LIN, POC, RTC, RCR, SVF, WW, MCG, BUZ	√	QB-78K0LX3-ZZZ-EE
		µPD78F0442	24																			
		µPD78F0443	32												–/–							
		µPD78F0444	48																			
		µPD78F0445	60																			
		µPD78F0451	16																			
		µPD78F0452	24																			
		µPD78F0453	32																			
		µPD78F0454	48																			
		µPD78F0455	60																			
		µPD78F0461	16																			
		µPD78F0462	24																			
		µPD78F0463	32																			
		µPD78F0464	48																			
		µPD78F0465	60																			
	NEW 78K0/LF3	µPD78F0471	16	Flash	768 1024 2048 768 1024 2048 768 1024 2048	62	2/2	–	–	9	4 x 8-bit, 1 x 16-bit	10	8 MHz, 240 kHz	√	40 x 4, 36 x 8 8 x 10-bit/ – 8 x 10-bit, 3 x 16-bit/	1.8 – 5.5	80	GCGADAX GKGAKAX	STD	LVI, LIN, POC, RTC, RCR, SVF, WW, MCG, BUZ	√	
		µPD78F0472	24																			
		µPD78F0473	32												–/–							
		µPD78F0474	48																			
		µPD78F0475	60																			
		µPD78F0481	16																			
		µPD78F0482	24																			
		µPD78F0483	32																			
		µPD78F0484	48																			
		µPD78F0485	60																			
		µPD78F0491	16																			
		µPD78F0492	24																			
		µPD78F0493	32																			
		µPD78F0494	48																			
		µPD78F0495	60																			
K Series	78K0/KB2	µPD78F0500	8	Flash	512 768 1024	23	1/2	–	√	6	4 x 8-bit, 1 x 16-bit	20	8 MHz, 240 kHz	–	–	1.8 – 5.5	30/ 36	MC-5A4-A, MCAB4X, FC-AA3-A	STD, (A), (A2)	LIN, LVI, POC, SVF, WW	– √	
		µPD78F0501	16																			
		µPD78F0502	24																			
		µPD78F0503	32																			
		µPD78F0503D																				
	78K0/KC2	µPD78F0511	16	Flash	768 1024 2048 3072	37/41 37 41	1/2	–	√	7	4 x 8-bit, 1 x 16-bit	20	8 MHz, 240 kHz	√	8 x 10-bit/ –	1.8 – 5.5	44/ 48 44 48	GB-UES-A, GBGAFAX/ GA-8EU-A, GAGAMAX	STD, (A), (A2)	LIN, LVI, POC, SVF, WW LIN, LVI, POC, SVF, WW, HMD	– √ – √	
		µPD78F0512	24																			
		µPD78F0513	32																			
		µPD78F0513D																				
		µPD78F0514	48																			
		µPD78F0515	60																			
		µPD78F0515D																				
	78K0/KD2	µPD78F0521	16	Flash	768 1024 2048 3072 5120 7168	45	1/2	–	√	7	4 x 8-bit, 1 x 16-bit	20	8 MHz, 240 kHz	√	–	1.8 – 5.5	52	GB-UET-A, GBGAG-AX	STD, (A), (A2)	LIN, LVI, POC, SVF, WW LIN, LVI, POC, SVF, WW, HMD	– √	QB-78K0KX2-ZZZ-EE
		µPD78F0522	24																			
		µPD78F0523	32																			
		µPD78F0524	48																			
		µPD78F0525	60																			
		µPD78F0526	96																			
		µPD78F0527	128																			
		µPD78F0527D																				
	78K0/KE2	µPD78F0531	16	Flash	768 1024 2048 3072 5120 7168	55	1/2 2/2	–	√	7 8	4 x 8-bit, 1 x 16-bit 4 x 8-bit, 2 x 16-bit	20	8 MHz, 240 kHz	√	–	1.8 – 5.5	64	GA-9EV-A, GAHABAX, GBUEUA, GBGAHAX, GCUBSA, GCGALAX, GK-UET-A, GKGAJAX, FC-AA1-A	STD, (A), (A2)	LIN, LVI, POC, SVF, WW LIN, LVI, POC, SVF, WW, HMD	– √ – √	
		µPD78F0532	24																			
		µPD78F0533	32																			
		µPD78F0534	48																			
		µPD78F0535	60																			
		µPD78F0536	96																			
		µPD78F0537	128																			
		µPD78F0537D																				
	78K0/KF2	µPD78F0544	48	Flash	2048 3072 5120 7168	71	3/2	–	√	8	4 x 8-bit, 2 x 16-bit	20	8 MHz, 240 kHz	√	–	1.8 – 5.5	80	GCUBTA, GCGADAX, GK-8EU-A, GKGAKAX	STD, (A), (A2)	LIN, LVI, POC, SVF, WW, HMD	– √	
		µPD78F0545	60																			
		µPD78F0546	96																			
		µPD78F0547	128																			
		µPD78F0547D																				
	NEW Motor Control	µPD78F0711	8	Flash	768 1024	15 48	–/1 1/1	– –	– –	5 7	2 x 8-bit, 1 x 16-bit, 6 x 10-bit for inverter	20	240 kHz	–	4 x 10-bit/ – 8 x 10-bit/ –	4.0 – 5.5	30 64	MC-5A4-A GK-9ET-A	STD	LVI, POC, SVF, HMD, RTO	√	QB-780714-ZZZ-EE
	NEW USB	µPD78F0712	16																			
		µPD78F0714	32																			
	NEW USB	µPD78F0731	16	Flash	3072	20	1/1	–	–	5	3 x 8-bit, 1 x 16-bit	16 MHz, 240 kHz, 6 MHz	–	–	–/–	4.0 – 5.5	30	MC-5A4-A	STD	USB, LIN, LVI, POC, SVF, WW, 256K data flash	√	QB-780731-ZZZ-EE
	CAN ASSP 3+	µPD78F0821	90	Flash	5120	76	2/1	1	–	8	2 x 8-bit, 5 x 16-bit	16	240 kHz	√	34 x 4	8 x 10-bit/ –	4.0 – 5.5	100	GC-8EA-A, GF-JBA-A	(A)	CM, LIN, SG, SMC	–	QB-780822-ZZZ-EE
		µPD78F0822	120																			
		µPD78F0822B																				
F Series	78K0/FC2	µPD78F0881	32	Flash	2048 3072 5120 7168	37 55 41	1/2 2/2	1	–	8	4 x 8-bit, 2 x 16-bit	20	8 MHz, 240 kHz	√	–	1.8 – 5.5	44 64 48	GBGAFAX GAGAMAX	(A), (A2)	LIN, LVI, HMD, POC, SVF, WW	– √	
		µPD78F0882	48																			
		µPD78F0883	60																			
		µPD78F0884	32																			
		µPD78F0885	48																			
		µPD78F0886	60																			
		µPD78F0887	48																			
	78K0/FE2	µPD78F0888	60	Flash	3072 5120 7168	55	2/2	1	–	10	4 x 8-bit, 4 x 16-bit	20	8 MHz, 240 kHz	√	–	12 x 10-bit/ –	1.8 – 5.5	64	GBGAHAX, GKGAKAX	(A), (A2)	LIN, LVI, HMD, POC, SVF, WW	– √	QB-78K0FX2-ZZZ-EE
		µPD78F0889	96																			
		µPD78F0890	128																			
	78K0/FF2	µPD78F0891	60	Flash	3072 5120 7168	71	2/2	1	–	10	4 x 8-bit, 4 x 16-bit	20	8 MHz, 240 kHz	√	–	16 x 10-bit/ –	1.8 – 5.5	80	GCGADAX, GKGAKAX	(A), (A2)	LIN, LVI, HMD, POC, SVF, WW	√	
		µPD78F0892	96																			
		µPD78F0893	128																			
78K0R K Series	NEW 78K0R/KE3	µPD78F1142	64	Flash	4096 6144 8192 10240 12288	55	2/3	–	2	10	7 x 16-bit	20	8 MHz, 240 kHz	√	–	8 x 10-bit/ –	1.8 – 5.5	64	GBGAHAX, GK-GAJ-AX	STD	DMA, LIN, LVI, POC, SVF, RTC, WW, MUL	√	QB-78K0RKX3-ZZZ-EE
		µPD78F1143	96																			
		µPD78F1144	128																			
		µPD78F1145	192																			
		µPD78F1146	256																			
	NEW 78K0R/KF3	µPD78F1152	64	Flash	4096 6144 8192 10240 12288	70	4/4	–	3	10	7 x 16-bit	20	8 MHz, 240 kHz	√	–	8 x 10-bit/ 2 x 8-bit	1.8 – 5.5	80	GCGADAX, GKGAKAX	STD	DMA, LIN, LVI, POC, SVF, RTC, WW, MUL	√	
		µPD78F1153	96																			
		µPD78F1154	128																			
		µPD78F1155	192																			
		µPD78F1156	256																			
	NEW 78K0R/KG3	µPD78F1162	64	Flash	4096 6144 8192 10240 12288 24576 30720	88	4/4	–	3	10	7 x 16-bit	20	8 MHz, 240 kHz	√	–	16 x 10-bit/ 2 x 8-bit	1.8 – 5.5	100	GCUBJAX, GF-GAS-AX	STD	DMA, LIN, LVI, POC, SVF, RTC, WW, MUL	√	
		µPD78F1163	96																			
		µPD78F1164	128																			
		µPD78F1165	192																			
		µPD78F1166	256																			
		µPD78F1167	384																			
		µPD78F1168	512																			
	NEW 78K0R/KH3	µPD78F1174	128	Flash	8192 10240 12288 24576 30720	116	6/4	–	5	14	10 x 16-bit	20	8 MHz, 240 kHz	√	–	16 x 10-bit/ 2 x 8-bit	1.8 – 5.5	128	GF-GAT-AX	STD	DMA, LIN, LVI, POC, SVF, RTC, WW, MUL	√	
		µPD78F1175	192																			
		µPD78F1176	256																			
		µPD78F1177	384																			
		µPD78F1178	512																			
	NEW 78K0R/KJ3	µPD78F1184	128	Flash	8192 10240 12288 24576 30720	132	6/4	–	5	14	10 x 16-bit	20	8 MHz, 240 kHz	√	–	16 x 10-bit/ 2 x 8-bit	1.8 – 5.5	144	GJ-GAE-AX	STD	DMA, LIN, LVI, POC, SVF, RTC, WW, MUL	√	
		µPD78F1185	192																			
		µPD78F1186	256																			
		µPD78F1187	384																			
		µPD78F1188	512																			

√ = yes
– = no

Please contact iSYSTEM directly. As initial step you are invited to visit the website www.isystem.com.

OCD = On-chip Debugging is supported with the MINICUBE2 (QB-MINI2-EE).

* **Qualification grades:**
STD = Standard grade: -40 - 85°C
(A) = (A) grade: -40 - 85°C
(A2) = (A2) grade: -40 - 125°C

** **Other features:**
BUZ = Buzzer output
CM = Clock monitor
DMA = Direct memory access
HMD = Hardware multiplier / divider
LIN = advanced, LIN capable UART
LVI = Low voltage indicator
MCG = Manchester code generator
MUL = Multiplier
POC = Power-On Clear (= advanced power-on reset)
RCR = Remote controller receiver
RTC = Real-time clock
RTO = Real-time output port
SG = Sound generator
SMC = Stepper motor controller
SVF = Simple voltage flash, (secure) self-programming
WW = Window watchdog

Package dimensions

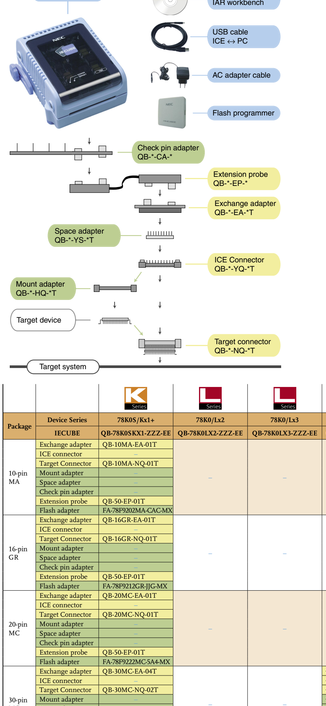
Size indicator	Pincount	QFP		CSP/LGA	Size [mm²]	Pin pitch [mm]
		SnBi	Ni/Pd/Au			
U	10	MC-CAC-A	–	–	225 mil	0.65
Y	16	GK-JJG-A	–	FH-2A2	1.9 x 2.2	0.5
				–	225 mil	0.65
A	20	MC-5A4-A	MC-CAA-AX	–	300 mil	0.65
B	30	MC-5A4-A	MC-CAB-AX	–	300 mil	0.65
				FC-AA3	4 x 4	0.5
C	44	GB-UES-A	GB-GAF-AX	–	10 x 10	0.8
	48	GA-8EU-A	GA-GAM-AX	–	7 x 7	0.5
D	52	GB-UET-A	GB-GAG-AX	–	10 x 10	0.65
				FC-AA1	5 x 5	0.5
E	64	GA-9EV-A	GA-HAB-AX	–	7 x 7	0.4
		GB-8EU-A GB-UEU-A	GB-GAH-AX	–	10 x 10	0.5
		GK-9ET-A GK-UET-A	GK-GAJ-AX	–	12 x 12	0.65
		GC-UBS-A	GC-GAL-AX	–	14 x 14	0.8
F	80	GK-8EU-A GK-9EU-A GC-8ET-A	GK-GAK-AX GC-GAD-AX	–	12 x 12	0.5
		GC-UET-A		–	14 x 14	0.65
G	100	GC-8EU-A GF-JBT-A	GC-UEU-AX	–	14 x 14	0.5
H	128		GF-GAT-AX	–	14 x 20	0.5
J	144	GJ-UEN-A	GJ-GAE-AX	–	20 x 20	0.5
K	176	GM-UEU-A	GM-GAR-AX	–	24 x 24	0.5
L	208		GD-LML-AX	–	28 x 28	0.5

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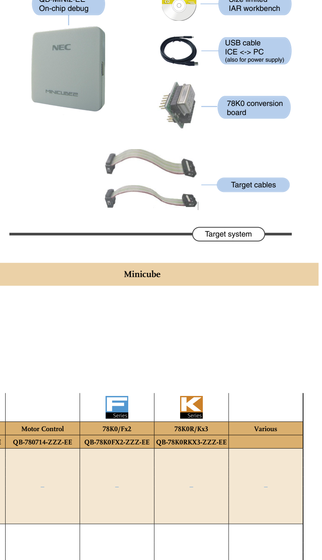
78K 8-/16-bit Microcontrollers

Issue February 2007

In-circuit Emulation IECUBE



On-chip Debugging Minicube



Package	Device Series	78K0S/Kx1+	78K0/Lx2	78K0/Lx3	78K0/Kx2	Motor Control	78K0/Fx2	78K0R/Kx3	Various
	IECUBE	QB-78K0SKX1-ZZZ-EE	QB-78K0LX2-ZZZ-EE	QB-78K0LX3-ZZZ-EE	QB-78K0KX2-ZZZ-EE	QB-730714-ZZZ-EE	QB-78K0FX2-ZZZ-EE	QB-78K0RKX3-ZZZ-EE	
10-pin MA	Exchange adapter	QB-10MA-EA-01T							
	ICE connector								
	Target Connector	QB-10MA-NQ-01T							
	Mount adapter								
	Space adapter								
	Check pin adapter								
	Extension probe	QB-50-EP-01T							
	Flash adapter	FA-78F9208MA-CAC-MX							
16-pin GR	Exchange adapter	QB-16GR-EA-01T							
	ICE connector								
	Target Connector	QB-16GR-NQ-01T							
	Mount adapter								
	Space adapter								
	Check pin adapter								
	Extension probe	QB-50-EP-01T							
	Flash adapter	FA-78F9212GR-JJG-MX							
20-pin MC	Exchange adapter	QB-20MC-EA-01T							
	ICE connector								
	Target Connector	QB-20MC-NQ-01T							
	Mount adapter								
	Space adapter								
	Check pin adapter								
	Extension probe	QB-50-EP-01T							
	Flash adapter	FA-78F9234MC5A4-MX							
30-pin MC	Exchange adapter	QB-30MC-EA-04T			QB-30MC-EA-02T	QB-30MC-EA-03T			QB-30MC-EA-01T
	ICE connector				QB-30MC-YQ-01T	QB-30MC-YQ-01T			QB-30MC-YQ-01T
	Target Connector	QB-30MC-NQ-02T			QB-30MC-NQ-01T	QB-30MC-NQ-01T			QB-30MC-NQ-01T
	Mount adapter				QB-30MC-HQ-01T	QB-30MC-HQ-01T			QB-30MC-HQ-01T
	Space adapter				QB-30MC-YS-01T	QB-30MC-YS-01T			QB-30MC-YS-01T
	Check pin adapter				QB-144-CA-01	QB-144-CA-01			QB-144-CA-01
	Extension probe	QB-50-EP-01T			QB-80-EP-01T	QB-80-EP-01T			QB-80-EP-01T
	Flash adapter	FA-78F9234MC5A4-MX							
36-pin FC	Exchange adapter				QB-36FC-EA-01T				
	ICE connector								
	Target Connector				QB-36FC-NQ-01T				
	Mount adapter								
	Space adapter								
	Check pin adapter				QB-144-CA-01				
	Extension probe				QB-80-EP-01T				
	Flash adapter				FA-78F0503FC-AA3-MX				
44-pin GB	Exchange adapter				QB-44GB-EA-03T		QB-44GB-EA-02T		
	ICE connector				QB-44GB-YQ-01T		QB-44GB-YQ-01T		
	Target Connector				QB-44GB-NQ-01T		QB-44GB-NQ-01T		
	Mount adapter				QB-44GB-HQ-01T		QB-44GB-HQ-01T		
	Space adapter				QB-44GB-YS-01T		QB-44GB-YS-01T		
	Check pin adapter				QB-144-CA-01		QB-144-CA-01		
	Extension probe				QB-80-EP-01T		QB-80-EP-01T		
	Flash adapter				FA-78F0515GA-8EU-MX		FA-78F0886GB-UES-MX		
48-pin GA	Exchange adapter			QB-48GA-EA-03T			QB-48GA-EA-01T		
	ICE connector			QB-48GA-YQ-01T	QB-48GA-YQ-01T		QB-48GA-YQ-01T		
	Target Connector			QB-48GA-NQ-01T	QB-48GA-NQ-01T		QB-48GA-NQ-01T		
	Mount adapter			QB-48GA-HQ-01T	QB-48GA-HQ-01T		QB-48GA-HQ-01T		
	Space adapter			QB-48GA-YS-01T	QB-48GA-YS-01T		QB-48GA-YS-01T		
	Check pin adapter			QB-144-CA-01	QB-144-CA-01		QB-144-CA-01		
	Extension probe			QB-80-EP-01T	QB-80-EP-01T		QB-80-EP-01T		
	Flash adapter			FA-78F0413GAM-MX	FA-78F0515GA-8EU-MX		FA-78F0886GA-8EU-MX		
52-pin GB	Exchange adapter			QB-52GB-EA-01T	QB-52GB-EA-02T				
	ICE connector			QB-52GB-YQ-01T	QB-52GB-YQ-01T				
	Target Connector			QB-52GB-NQ-01T	QB-52GB-NQ-01T				
	Mount adapter			QB-52GB-HQ-01T	QB-52GB-HQ-01T				
	Space adapter			QB-52GB-YS-01T	QB-52GB-YS-01T				
	Check pin adapter			QB-144-CA-01	QB-144-CA-01				
	Extension probe			QB-80-EP-01T	QB-80-EP-01T				
	Flash adapter			FA-78F0413GB-GAG-MX	FA-78F0527GB-UBT-MX				
64-pin GA	Exchange adapter				QB-64GA-EA-04T				
	ICE connector								
	Target Connector				QB-64GA-NQ-01T				
	Mount adapter								
	Space adapter								
	Check pin adapter				QB-144-CA-01				
	Extension probe				QB-80-EP-01T				
	Flash adapter				FA-78F0537GK-UBT-MX				
64-pin GB	Exchange adapter		QB-64GB-EA-07T	QB-64GB-EA-09T	QB-64GB-EA-04T		QB-64GB-EA-03T	QB-64GB-EA-08T	
	ICE connector		QB-64GB-YQ-01T	QB-64GB-YQ-01T	QB-64GB-YQ-01T		QB-64GB-YQ-01T	QB-64GB-YQ-01T	
	Target Connector		QB-64GB-NQ-01T	QB-64GB-NQ-01T	QB-64GB-NQ-01T		QB-64GB-NQ-01T	QB-64GB-NQ-01T	
	Mount adapter		QB-64GB-HQ-01T	QB-64GB-HQ-01T	QB-64GB-HQ-01T		QB-64GB-HQ-01T	QB-64GB-HQ-01T	
	Space adapter		QB-64GB-YS-01T	QB-64GB-YS-01T	QB-64GB-YS-01T		QB-64GB-YS-01T	QB-64GB-YS-01T	
	Check pin adapter		QB-144-CA-01	QB-144-CA-01	QB-144-CA-01		QB-144-CA-01	QB-144-CA-01	
	Extension probe		QB-80-EP-01T	QB-80-EP-01T	QB-80-EP-01T		QB-80-EP-01T	QB-144-EP-02S	
	Flash adapter		FA-78F0936GB-UEU-MX	FA-78F0965GB-GAH-MX	FA-78F0537GB-UEU-MX		FA-78F0899GB-UEU-MX	FA-78F0146GB-GAH-MX	
64-pin GC	Exchange adapter				QB-64GC-EA-03T				
	ICE connector				QB-64GC-YQ-01T				
	Target Connector				QB-64GC-NQ-01T				
	Mount adapter				QB-64GC-HQ-01T				
	Space adapter				QB-64GC-YS-01T				
	Check pin adapter				QB-144-CA-01				
	Extension probe				QB-80-EP-01T				
	Flash adapter				FA-78F0537GC-UBS-MX				
64-pin GK	Exchange adapter		QB-64GK-EA-05T	QB-64GK-EA-07T	QB-64GK-EA-04T	QB-64GK-EA-01T	QB-64GK-EA-03T	QB-64GK-EA-06T	
	ICE connector		QB-64GK-YQ-01T	QB-64GK-YQ-01T	QB-64GK-YQ-01T	QB-64GK-YQ-01T	QB-64GK-YQ-01T	QB-64GK-YQ-01T	
	Target Connector		QB-64GK-NQ-01T	QB-64GK-NQ-01T	QB-64GK-NQ-01T	QB-64GK-NQ-01T	QB-64GK-NQ-01T	QB-64GK-NQ-01T	
	Mount adapter		QB-64GK-HQ-01T	QB-64GK-HQ-01T	QB-64GK-HQ-01T	QB-64GK-HQ-01T	QB-64GK-HQ-01T	QB-64GK-HQ-01T	
	Space adapter		QB-64GK-YS-01T	QB-64GK-YS-01T	QB-64GK-YS-01T	QB-64GK-YS-01T	QB-64GK-YS-01T	QB-64GK-YS-01T	
	Check pin adapter		QB-144-CA-01	QB-144-CA-01	QB-144-CA-01	QB-144-CA-01	QB-144-CA-01	QB-144-CA-01	
	Extension probe		QB-144-EP-01S	QB-80-EP-01T	QB-80-EP-01T	QB-80-EP-01T	QB-80-EP-01T	QB-144-EP-02S	
	Flash adapter		FA-78F0536GK-UBT-MX	FA-78F0965GK-GAJ-MX	FA-78F0537GK-UBT-MX	FA-64GK-9ET-A	FA-78F0899GK-UBT-MX	FA-78F1146GK-GAJ-MX	
80-pin GC	Exchange adapter		QB-80GC-EA-04T* QB-80GC-EA-05T**	QB-80GC-EA-01T	QB-80GC-EA-01T		QB-80GC-EA-01T	QB-80GC-EA-06T	
	ICE connector		QB-80GC-YQ-01T	QB-80GC-YQ-01T	QB-80GC-YQ-01T		QB-80GC-YQ-01T	QB-80GC-YQ-01T	
	Target Connector		QB-80GC-NQ-01T	QB-80GC-NQ-01T	QB-80GC-NQ-01T		QB-80GC-NQ-01T	QB-80GC-NQ-01T	
	Mount adapter		QB-80GC-HQ-01T	QB-80GC-HQ-01T	QB-80GC-HQ-01T		QB-80GC-HQ-01T	QB-80GC-HQ-01T	
	Space adapter		QB-80GC-YS-01T	QB-80GC-YS-01T	QB-80GC-YS-01T		QB-80GC-YS-01T	QB-80GC-YS-01T	
	Check pin adapter		QB-144-CA-01	QB-144-CA-01	QB-144-CA-01		QB-144-CA-01	QB-144-CA-01	
	Extension probe		QB-144-EP-01S	QB-80-EP-01T	QB-80-EP-01T		QB-80-EP-01T	QB-144-EP-02S	
	Flash adapter		FA-78F0976GC-UBT-MX FA-78F0186GC-UBT-MX	FA-78F0495GC-GAD-MX	FA-78F0547GC-UBT-MX		FA-78F0893GC-UBT-MX	FA-78F1156GC-GAD-MX	
80-pin GK	Exchange adapter		QB-80GK-EA-04T* QB-80GK-EA-05T**	QB-80GK-EA-01T	QB-80GK-EA-01T		QB-80GK-EA-01T	QB-80GK-EA-06T	
	ICE connector		QB-80GK-YQ-01T	QB-80GK-YQ-01T	QB-80GK-YQ-01T		QB-80GK-YQ-01T	QB-80GK-YQ-01T	
	Target Connector		QB-80GK-NQ-01T	QB-80GK-NQ-01T	QB-80GK-NQ-01T		QB-80GK-NQ-01T	QB-80GK-NQ-01T	
	Mount adapter		QB-80GK-HQ-01T	QB-80GK-HQ-01T	QB-80GK-HQ-01T		QB-80GK-HQ-01T	QB-80GK-HQ-01T	
	Space adapter		QB-80GK-YS-01T	QB-80GK-YS-01T	QB-80GK-YS-01T		QB-80GK-YS-01T	QB-80GK-YS-01T	
	Check pin adapter		QB-144-CA-01	QB-144-CA-01	QB-144-CA-01		QB-144-CA-01	QB-144-CA-01	CAN ASSP 1+
	Extension probe		QB-144-EP-01S	QB-80-EP-01T	QB-80-EP-01T		QB-80-EP-01T	QB-144-EP-02S	QB-780822-ZZZ-EE
	Flash adapter		FA-78F0576GK-8EU-MX FA-78F0186GK-8EU-MX	FA-78F0495GK-GAK-MX	FA-78F0547GK-8EU-MX		FA-78F0893GK-8EU-MX	FA-78F1156GK-GAK-MX	
100-pin GC	Exchange adapter		QB-100GC-EA-03T					QB-100GC-EA-01T	QB-100GC-EA-02T
	ICE connector		QB-100GC-YQ-01T					QB-100GC-YQ-01T	QB-100GC-YQ-01T
	Target Connector		QB-100GC-NQ-01T					QB-100GC-NQ-01T	QB-100GC-NQ-01T
	Mount adapter		QB-100GC-HQ-01T					QB-100GC-HQ-01T	QB-100GC-HQ-01T
	Space adapter		QB-100GC-YS-01T					QB-100GC-YS-01T	QB-100GC-YS-01T
	Check pin adapter		QB-144-CA-01					QB-144-CA-01	QB-144-CA-01
	Extension probe		QB-144-EP-01S					QB-144-EP-02S	QB-144-EP-01S
	Flash adapter		FA-78F0397GC-8EU-MX					FA-78F1168GC-UEU-MX	FA-100GC-8EU-A
100-pin GF	Exchange adapter		QB-100GF-EA-03T					QB-100GF-EA-04T	QB-100GF-EA-02T
	ICE connector		QB-100GF-YQ-01T					QB-100GF-YQ-01T	QB-100GF-YQ-01T
	Target Connector		QB-100GF-NQ-01T					QB-100GF-NQ-01T	QB-100GF-NQ-01T
	Mount adapter		QB-100GF-HQ-01T					QB-100GF-HQ-01T	QB-100GF-HQ-01T
	Space adapter		QB-100GF-YS-01T					QB-100GF-YS-01T	QB-100GF-YS-01T
	Check pin adapter		QB-144-CA-01					QB-144-CA-01	QB-144-CA-01
	Extension probe		QB-144-EP-01S					QB-144-EP-02S	QB-144-EP-01S
	Flash adapter		FA-78F0397GF-JBT-MX					FA-78F1168GF-GAS-MX	FA-100GF-3BA-A
128-pin GF	Exchange adapter							QB-128GF-EA-01T	
	ICE connector							QB-128GF-YQ-01T	
	Target Connector							QB-128GF-NQ-01T	
	Mount adapter							QB-128GF-HQ-01T	
	Space adapter							QB-128GF-YS-01T	
	Check pin adapter							QB-144-CA-01	
	Extension probe							QB-144-EP-02S	
	Flash adapter							FA-78F1176GF-GAT-MX	
144-pin GJ	Exchange adapter							QB-144GJ-EA-05T	
	ICE connector							QB-144GJ-YQ-01T	
	Target Connector							QB-144GJ-NQ-01T	
	Mount adapter							QB-144GJ-HQ-01T	
	Space adapter							QB-144GJ-YS-01T	
	Check pin adapter							QB-144-CA-01	
	Extension probe							QB-144-EP-02S	
	Flash adapter							FA-78F1188GJ-GAE-MX	

* with ADC
** no ADC

Software & Dongles

IAR Workbench (8-bit)

- Integrated development environment for 78K0S, 78K0 and 78K0R
  - C/EC++ support
  - Compiler, assembler, linker, debugger, simulator, project manager, editor
- Order code: EW78K-FULL-EE

IAR Dongles

- Optional, not mandatory
  - Supports several installations for a single user
  - Easy re-installation after a memory accident on the PC
- Order code:
  - IAR-DONGLE (Parallel port interface)
  - IAR-DONGLE-USB (USB interface)



NEC Debugger

- Free of charge download from our website

Demo / Starter

Low Pin Count – Do it!

- Main board
  - PC connection via USB
  - Prototyping space
- USB cable
- IAR workbench (size limited)
- Order code: LPC-DOT



78K0R – Cool it! NEW

- Main board
  - 78K0R/JG3 (μPD78F1166GF)
  - PC connection via USB
  - LCD display
- USB cable
- IAR workbench (size limited)
- Order code: 78K0R-COOLIT



Low Voltage Motor Control NEW

- CPU board: μPD78F0714
- Inverter board
- I/O board
- 12 V BLDC motor
- Dedicated GUI and sample programs
- Order code: MC-LVKIT-714 (Components also available separately)



I_Line – See it!

- Main board
  - 78K0/LG2 (μPD78F0397D)
  - PC connection via USB
  - Prototyping space
- USB cable
- IAR workbench (size limited)
- Order code: I_LINE-SEEIT

78K0/Fx2 – CAN it!

- Main board
  - PC connection via USB
  - LCD display
  - Temperature sensor
- Daughter board
  - 78K0/FF2 (μPD78F0893)
  - CAN transceiver
- USB cable
- IAR workbench (size limited)
- Order code: 78K0FX2-CANIT



Programming

Flash programmer

- Universal for all MCU flash devices from NEC
- PC communication
  - via UART
  - via USB
- Order code: PG-FP4-E

MINICUBE 2 NEW

- Low price programmer
- Suitable for all single voltage flash devices
- Order code: QB-MINI2-EE

Mandatory
Optional
Alternative
Included in delivery

Downloaded from Arrow.com.

V850 32-bit Microcontrollers

Issue February 2007

Device			Memory			Interfaces				Timers				Additional Peripherals			Miscellaneous Information					
Series	Nickname	Part Number	Size [kB]	Type	RAM [kB]	I/O Lines	CSI/UARTx	CAN	I²C	External Bus	Channels	PWMs	Clock Speed [MHz]	Internal Oscillator(s)	SubClock [32.768 kHz]	LCD	A/D - D/A-Converter	Supply Voltage [V]	Pins	Packages	Qualification*	Other Features**	OCD	In-Circuit Emulator
I Series	V850E/IA3	μPD703183	128	Mask	6	50	2/2	–	–	–	10	11 x 16-bit	64	–	–	–	12 x 10-bit/ –	2.3 – 2.7 4.5 – 5.5	80	GC-8BT-A	STD	4-ch DMA, motor control function	–	QB-V850EIA4-ZZZ-EE
		μPD70F3184	256	Flash	12																			
	V850E/IA4	μPD703185	128	Mask	6	64	2/2	–	–	–	10	12 x 16-bit	64	–	–	–	16 x 10-bit/ –	2.3 – 2.7 4.5 – 5.5	100	GC-8EU-A, GF-3BA-A	STD	4-ch DMA, motor control function	√	
		μPD70F3186	256	Flash	12																			
	V850ES/IE2	μPD70F3713	64	Flash	6	39	1/2	–	–	–	8	10 x 16-bit	20	240 kHz	–	–	8 x 10-bit/ –	3.5 - 5.5	64	GC-8BS	STD	LVI, POC, RCF, SVF, motor control function	–	
		μPD70F3714	128																					
	V850ES/IK1	μPD703327	64	Mask	4	39	1/2	–	–	–	8	10 x 16-bit	32	240 kHz	–	–	8 x 10-bit/ –	3.5 – 5.5	64	GC-8BS	STD	CM, POC, LVI, RCF, SVF, motor control function	–	
		μPD703329	128	Mask	6																			
		μPD70F3329	128	Flash	6																			
K Series	V850ES/KE1	μPD703207H	128	Mask	4	51	2/2	–	(√)	–	10	2 x 16-bit, 4 x 8-bit	20	–	√	–	8 x 10-bit/ –	2.7 – 5.5	64	GB-8EU-A, GK-9ET-A	STD	RCF, SVF	–	QB-V850ESKX1H-ZZZ-EE
		μPD70F3207H		Flash																				
	V850ES/KE1+	μPD703302	128	Mask	4	51	2/2	–	(√)	–	10	2 x 16-bit, 4 x 8-bit	20	240 kHz	√	–	8 x 10-bit/ –	2.7 – 5.5	64	GB-8EU-A, GK-9ET-A	STD	CM, LIN, LVI, POC, SVF, RCF	–	
		μPD70F3302		Flash																				
	V850ES/KF1	μPD703208	64	Mask	4	67	3/2	–	(√)	8/16	10 11	2 x 16-bit, 4 x 8-bit	20	–	√	–	8 x 10-bit/ –	2.7 – 5.5	80	GC-8BT-A, GK-9EU-A	STD	RCF, SVF	–	
		μPD703209	96																					
		μPD703210	128		6																			
		μPD70F3210H		Flash																				
		μPD703211H	256	Mask	12																			
		μPD70F3211H		Flash																				
	V850ES/KF1+	μPD70F3306	128	Flash	6	67	3/2	–	(√)	8/16	11	2 x 16-bit, 4 x 8-bit	20	240 kHz	√	–	8 x 10-bit/ –	2.7 – 5.5	80	GC-8BT-A, GK-9EU-A	STD	CM, LIN, LVI, POC, RCF, SVF	–	
		μPD703308	256	Mask	12																			
		μPD70F3308		Flash																				
	V850ES/KG1	μPD703212	64	Mask	4	84	4/2	–	(√)	8/16	12 13	4 x 16-bit, 4 x 8-bit 5 x 16-bit, 4 x 8-bit	20	–	√	–	8 x 10-bit/ 2 x 8-bit	2.7 – 5.5	100	GC-8EU-A, GF-JBT-A	STD	RCF, SVF	–	
		μPD703213	96																					
		μPD703214	128		6																			
		μPD70F3214H		Flash																				
		μPD703215H	256	Mask	16																			
		μPD70F3215H		Flash																				
	V850ES/KG1+	μPD70F3311	128	Flash	6	84	4/3	–	(√)	8/16	13	5 x 16-bit, 4 x 8-bit	20	240 kHz	√	–	8 x 10-bit/ 2 x 8-bit	2.7 – 5.5	100	GC-8EU-A, GF-JBT-A	STD	CM, LIN, LVI, POC, RCF, SVF	–	
		μPD703313	256	Mask	16																			
		μPD70F3313		Flash																				
	V850ES/KJ1	μPD703216	96	Mask	4	128	5/3	–	(√)	8/16	14 15	6 x 16-bit, 4 x 8-bit 7 x 16-bit, 4 x 8-bit	20	–	√	–	16 x 10-bit/ 2 x 8-bit	2.7 – 5.5	144	GJ-UEN-A	STD	RCF, SVF RCF, SVF	–	
		μPD703217	128		6																			
		μPD70F3217H		Flash																				
		μPD70F3218H	256	Flash	16																			
	V850ES/KJ1+	μPD70F3316	128	Flash	6	128	5/3	–	(√)	8/16	15	7 x 16-bit, 4 x 8-bit	20	240 kHz	√	–	16 x 10-bit/ 2 x 8-bit	2.7 – 5.5	144	GJ-UEN-A	STD	CM, LIN, LVI, POC, RCF, SVF	–	
		μPD70F3318	256	Flash	16																		√	
F Series	NEW V850ES/FE3	μPD70F3370	128	Flash	8	51	2/2	1	1	–	8	8 x 16-bit	32	240 KHz, 8 Mhz	32.768 KHz Crystal or 28 KHz RC	–	10 x 10-bit/ –	3.5 – 5.5	64	GB-GAH-AX	(A), (A1), (A2)	CM, LIN, LVI, POC, SVF	√	QB-V850ESFX3-ZZZ-EE Z SYSTEM
		μPD70F3371	256		16																			
	NEW V850ES/FF3	μPD70F3372	128	Flash	8	67	2/2	1	1	–	8	8 x 16-bit	32	240 KHz, 8 Mhz	32.768 KHz Crystal or 28 KHz RC	–	12 x 10-bit/ –	3.5 – 5.5	80	GK-GAK-AX	(A), (A1), (A2)	CM, LIN, LVI, POC, SVF	√	
		μPD70F3373	256		16																			
	NEW V850ES/FG3	μPD70F3374	128	Flash	8	84	2/3	2	1	–	9	11 x 16-bit	32 48	240 KHz, 8 Mhz	32.768 KHz Crystal or 28 KHz RC	–	16 x 10-bit/ –	3.5 – 5.5	100	GC-UEU-AX	(A), (A1), (A2)	CM, LIN, LVI, POC, SVF	√	
		μPD70F3375	256		16																			
		μPD70F3376	384		24																			
		μPD70F3377	512		32																			
	NEW V850ES/FJ3	μPD70F3378	256	Flash	16	128	4/6	3 4	3 4	1	8/16	14 x 16-bit	32 48	240 KHz, 8 Mhz	32.768 KHz Crystal or 28 KHz RC	–	24 x 10-bit/ –	3.5 – 5.5	144	GJ-GAE-AX	(A); (A1), (A2)	CM, LIN, LVI, POC, SVF	√	
		μPD70F3379	384		24																			
		μPD70F3380	512		32																			
		μPD70F3381	768		40																			
		μPD70F3382	1024		48																			
	NEW V850ES/FK3	μPD70F3383	512	Flash	32	152	4/8	5	1	8/16	13	17 x 16-bit	48	240 KHz, 8 Mhz	32.768 KHz Crystal or 28 KHz RC	–	24 x 10-bit, 16 x 10-bit/ –	3.5 – 5.5	176	GM-GAR-AX	(A), (A1), (A2)	CM, LIN, LVI, POC, SVF	√	
		μPD70F3384	768		48																			
		μPD70F3385	1024		60																			
S Series	NEW V850ES/SG3	μPF70F3335Y	256	Flash	24	84	5/3	1	3	8/16	10	9 x 16-bit	32	220 kHz	√	–	12 x 10-bit/ 2 x 8-bit	2.85 – 3.6	100	GC-UEU-AX, GC-8EA-A	(A)	CM, LIN, LVI, SVF, RCF, 4-ch DMA	√	QB-V850ESSX2-ZZZ-EE Z SYSTEM
		μPD70F3336Y	384		32																			
		μPD70F3350Y	512		40																			
		μPD70F3351Y	640		48																			
		μPD70F3352Y	768		60																			
		μPD70F3353Y	1024																					
	NEW V850ES/SJ3	μPD70F3354Y	384	Flash	32	128	6/4	1 2	3 3	8/16	13	12 x 16-bit	32	220 kHz	√	–	16 x 10-bit/ 2 x 8-bit	2.85 – 3.6	144	GJ-GAE-AX, GJ-UEN-A	(A)	CM, LIN, LVI, SVF, RCF, 4-ch DMA	√	
		μPD70F3355Y	512		40																			
		μPD70F3356Y	640		48																			
		μPD70F3357Y	768		60																			
		μPD70F3358Y	1024																					
		μPD70F3364Y	384		32																			
		μPD70F3365Y	512		40																			
		μPD70F3366Y	640		48																			
		μPD70F3367Y	768		60																			
		μPD70F3368Y	1024																					
R Series	V850E/RS1	μPD70F3402-32	128	Flash	10	69	4/2 5/2 5/3	2	–	8/16	8	10 x 16-bit	32 32 40	240 kHz	–	–	16 x 10-bit/ –	4.0 – 5.5	100	GC-8EU-A	(A)	CM, LVI, POC, 6-ch DMA,	√	QB-V850ERS1-ZZZ-EE
		μPD70F3403-32	256		16																			
		μPD70F3403-40																						
D Series	NEW V850E/DJ3	μPD70F3421	256	Flash	12	112	2/2 3/2	2	2	8/16	14 19	12 x 16-bit 16 x 16-bit	24 48	240 kHz	√	40x4	12 x 10-bit/ 16 x 10-bit/	4.0 – 5.5	144	GJ-GAE-AX	(A)	CM, LIN, LVI, RCF, SVF, 4-ch DMA, 6 x SMC	√	QB-703427-MZZ-EE QB-703426-ZZZ-EE
		μPD70F3422	384		16																			
		μPD70F3423	512		20																			
		μPD70F3424			24																			
		μPD70F3425	1024		32																			
		μPD70F3426	2048		84																			
	NEW V850E/DL3	μPD70F3427	1024	Flash	60	112	3/2	2	2	8/16	19	16 x 16-bit	48	240 kHz	√	–	16 x 10-bit/ –	4.0 – 5.5	208	GD-LML-AX	(A)	CM, LIN, LVI, RCF, SVF, 4-ch DMA, 6 x SMC	√	QB-703427-MZZ-EE
H Series	V850ES/HE2	μPD70F3700	64	Flash	6	51	2/2	–	–	–	8	8 x 16-bit	20	200 kHz	√	–	10 x 10-bit/ –	3.5 - 5.5	64	GB-8EU-A	STD	CM, LIN, LVI POC, RCF, SVF	√	QB-V850ESFX2-ZZZ-EE
	V850ES/HF2	μPD70F3701	128	Flash	12	67	2/2	–	–	–	8	8 x 16-bit	20	200 kHz	√	–	12 x 10-bit/ –	3.5 - 5.5	80	GK-9EU-A	STD	CM, LIN, LVI POC, RCF, SVF	√	
		μPD70F3702	64																					
		μPD70F3703	128																					
		μPD70F3704	256																					
	V850ES/HG2	μPD70F3706	128	Flash	12	84	2/3	–	–	–	9	12 x 16-bit	20	200 kHz	√	–	16 x 10-bit/ –	3.5 - 5.5	100	GC-8EA-A	STD	CM, LIN, LVI POC, RCF, SVF	√	
		μPD70F3707	256																					
	V850ES/HJ2	μPD70F3709	128	Flash	12	128	3/3	–	–	8/16	10	17 x 16-bit	20	200 kHz	√	–	24 x 10-bit/ –	3.5 - 5.5	144	GJ-UEN-A	STD	CM, LIN, LVI POC, RCF, SVF	√	
		μPD70F3710	256																					
		μPD70F3711	376		20																			
		μPD70F3712	512				3/4																	
J Series	V850ES/JG2	μPD70F3715	128	Flash	12	84	5/3	–	3	8/16	10	9 x 16-bit	20	200 kHz	√	–	12 x 10-bit/ 2 x 8-bit	2.85 - 3.6	100	GC-8EA-A, GF-JBT-A	STD	CM, LIN, LVI, RCF, SVF 4-ch DMA, RTO	√	QB-V850ESSX2-ZZZ-EE
		μPD70F3716	256		24																			
		μPD70F3717	384		32															GC-8EA-A				
		μPD70F3718	512		40																			
		μPD70F3719	640		48																			
	V850ES/JJ2	μPD70F3720	128	Flash	12	128	6/4	–	3	8/16	13	12 x 16-bit	20	200 kHz	√	–	16 x 10-bit/ 2 x 8-bit	2.85 - 3.6	144	GJ-UEN-A	STD	CM, LIN, LVI, RCF, SVF 4-ch DMA, RTO	√	
		μPD70F3721	256		24																			
		μPD70F3722	384		32																			
		μPD70F3723	512		40																			
		μPD70F3724	640		48																			
	NEW V850ES/JJ3	μPD70F3745	768	Flash	60	128	6/4	–	3	8/16	13	12 x 16-bit	32	220 kHz	√	–	16 x 10-bit/ 2 x 8-bit	2.85 - 3.6	144	GJ-GAE-AX	STD	CM, LIN, LVI, RCF, SVF 4-ch DMA, RTO	√	QB-V850ESSX2-EE
		μPD70F3746	1024																					

√ = yes
– = no
(√) = optional

Z SYSTEM Please contact iSYSTEM directly. As initial step you are invited to visit the website www.isystem.com.

OCD = On-chip Debug is supported with V850 MINICUBE (QB-V850MINI-EE)

* **Qualification grades:**
STD = Standard grade: -40 - 85°C
(A) = (A) grade: -40 - 85°C
(A1) = (A1) grade: -40 - 110°C
(A2) = (A2) grade: -40 - 125°C

** **Other features:**
CM = Clock monitor
LIN = advanced, LIN capable UART
LVI = Low voltage indicator
POC = Power-On Clear (= advanced power-on reset)
RC = for RC oscillator
RCF = ROM correction feature
RTO = Real-time output port
SG = Sound generator
SMC = Stepper motor controller
SVF = Single voltage flash, (secure) self-programming
WW = Window watchdog

Package dimensions

Size indicator	Pincount	QFP		CSP/LGA	Size [mm²]	Pin pitch [mm]
		SnBi	Ni/Pd/Au			
U	10	MC-CAC-A	–	–	225 mil	0.65
Y	16	–	–	FH-2A2	1.9 x 2.2	0.5
		GR-JJG-A	–	–	225 mil	0.65
A	20	MC-5A4-A	MC-CAA-AX	–	300 mil	0.65
B	30	MC-5A4-A	MC-CAB-AX	–	300 mil	0.65
	36	–	–	FC-AA3	4 x 4	0.5
C	44	GB-UES-A	GB-GAF-AX	–	10 x 10	0.8
D	48	GA-8EU-A	GA-GAM-AX	–	7 x 7	0.5
	52	GB-UET-A	GB-GAG-AX	–	10 x 10	0.65
E	64	–	–	FC-AA1	5 x 5	0.5
		GA-9EV-A	GA-HAB-AX	–	7 x 7	0.4
		GB-8EU-A GB-UEU-A	GB-GAH-AX	–	10 x 10	0.5
		GK-9ET-A	GK-GAJ-AX	–	12 x 12	0.65
		GK-UET-A				
		GC-UBS-A	GC-GAL-AX	–	14 x 14	0.8
F	80	GK-8EU-A GK-9EU-A	GK-GAK-AX	–	12 x 12	0.5
		GC-8BT-A GC-UBT-A	GC-GAD-AX	–	14 x 14	0.65
G	100	GC-8EU-A GF-JBT-A	GC-UEU-AX	–	14 x 14	0.5
H	128	–	GF-GAT-AX	–	14 x 20	0.5
J	144	GJ-UEN-A	GJ-GAE-AX	–	20 x 20	0.5
K	176	GM-UEU-A	GM-GAR-AX	–	24 x 24	0.5
L	208	–	GD-LML-AX	–	28 x 28	0.5

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V850 32-bit Microcontrollers

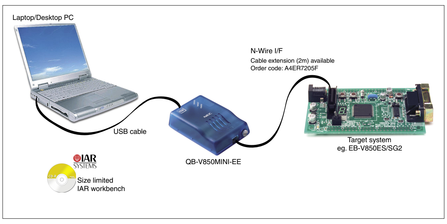
Issue February 2007

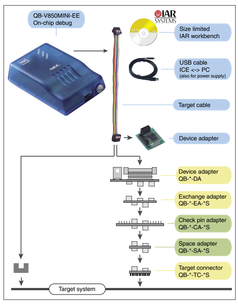
On-chip Debugging

N-Wire

Purpose	N-Wire based debugging system
Supported devices	ALL V850 devices with N-Wire interface
External power supply	Not required
Device interface	N-Wire
PC interface	USB
Order code	QB-V850MINI-EE

Nickname	MINICUBE	Device adapter
K Series	QB-V850MINI-EE	QB-V850ESKX1H-DA
F Series, H Series		use appropriate OCD device
S Series, J Series		
I Series		
... RS1, MA3, ME2, ME3		

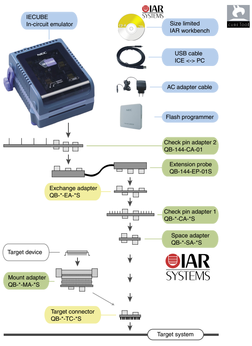




In-circuit Emulation

IECUBE

Package	Device Subseries	V850E/IAx V850ES/Jx2	V850ES/Kx1+	V850ES/Fx3	V850ES/Sx3	V850E/RS1	V850ES/Dx3	V850ES/Hx2	V850ES/Jx2
	IECUBE	QB-V850E1A4-ZZZ-EE	QB-V850ESKX1H-ZZZ-EE	QB-V850ESFX3-ZZZ-EE	QB-V850ESSX2-ZZZ-EE	QB-V850ER S1-ZZZ-EE	QB-70F3426-ZZZ-EE QB-70F3427-MZZ-EE	QB-V850ESFX2-ZZZ-EE	QB-V850ESSX2-ZZZ-EE
64-pin GK	Exchange adapter		QB-64-EA-01S						
	Target connector		QB-64GK-TC-01S						
	Mount adapter		QB-64GK-MA-01S						
	Space adapter		QB-64-SA-01S						
	Check pin adapter 1		QB-64-CA-01S						
	Check pin adapter 2		QB-144-CA-01						
	Extension probe		QB-144-EP-01S						
	Flash adapter		FA-64GK-9ET-A						
64-pin GC	Exchange adapter	QB-64GC-EA-01S							
	Target connector	QB-64GC-TC-01S							
	Mount adapter	QB-64GC-MA-01S							
	Space adapter	QB-64-SA-01S							
	Check pin adapter 1	QB-64-CA-01S							
	Check pin adapter 2	QB-144-CA-01							
	Extension probe	QB-144-EP-01S							
	Flash adapter	FA-70F3714GC-8BS-MX							
64-pin GB	Exchange adapter		QB-64-EA-01S	QB-64GB-EA-01S				QB-64GB-EA-01S	
	Target connector		QB-64GB-TC-01S	QB-64GB-TC-01S				QB-64GB-TC-01S	
	Mount adapter		QB-64GB-MA-01S	QB-64GB-MA-01S				QB-64GB-MA-01S	
	Space adapter		QB-64-SA-01S	QB-64-SA-01S				QB-64-SA-01S	
	Check pin adapter 1		QB-64-CA-01S	QB-64-CA-01S				QB-64-CA-01S	
	Check pin adapter 2		QB-144-CA-01	QB-144-CA-01				QB-144-CA-01	
	Extension probe		QB-144-EP-01S	QB-144-EP-01S				QB-144-EP-01S	
	Flash adapter		FA-70F3726GB-8EU-MX	FA-70F3701GB-8EU-MX				FA-70F3701GB-8EU-MX	
80-pin GK	Exchange adapter		QB-80GK-EA-01S	QB-80GK-EA-02S				QB-80GK-EA-02S	
	Target connector		QB-80GK-TC-01S	QB-80GK-TC-01S				QB-80GK-TC-01S	
	Mount adapter		QB-80GK-MA-01S	QB-80GK-MA-01S				QB-80GK-MA-01S	
	Space adapter		QB-80-SA-01S	QB-80-SA-01S				QB-80-SA-01S	
	Check pin adapter 1		QB-80-CA-01S	QB-80-CA-01S				QB-80-CA-01S	
	Check pin adapter 2		QB-144-CA-01	QB-144-CA-01				QB-144-CA-01	
	Extension probe		QB-144-EP-01S	QB-144-EP-01S				QB-144-EP-01S	
	Flash adapter		FA-80GK-9EU-A	FA-70F70GK-9EU-MX				FA-70F3704GK-9EU-MX	
80-pin GC	Exchange adapter	QB-80GC-EA-01S	QB-80GC-EA-02S						
	Target connector	QB-80GC-TC-01S	QB-80GC-TC-01S						
	Mount adapter	QB-80GC-MA-01S	QB-80GC-MA-01S						
	Space adapter	QB-80-SA-01S	QB-80-SA-01S						
	Check pin adapter 1	QB-80-CA-01S	QB-80-CA-01S						
	Check pin adapter 2	QB-144-CA-01	QB-144-CA-01						
	Extension probe	QB-144-EP-01S	QB-144-EP-01S						
	Flash adapter	FA-100GF-8BT-A	FA-70F3723GJ-8BT-MX						
100-pin GF	Exchange adapter	QB-100GF-EA-02S	QB-100GF-EA-01S		QB-100GF-EA-01S				QB-100GF-EA-01S
	Target connector	QB-100GF-TC-01S	QB-100GF-TC-01S		QB-100GF-TC-01S				QB-100GF-TC-01S
	Mount adapter	QB-100GF-MA-02S	QB-100GF-MA-01S		QB-100GF-MA-01S				QB-100GF-MA-01S
	Space adapter	QB-100-SA-01S	QB-100-SA-01S		QB-100-SA-01S				QB-100-SA-01S
	Check pin adapter 1	QB-100-CA-01S	QB-100-CA-01S		QB-100-CA-01S				QB-100-CA-01S
	Check pin adapter 2	QB-144-CA-01	QB-144-CA-01		QB-144-CA-01				QB-144-CA-01
	Extension probe	QB-144-EP-01S	QB-144-EP-01S		QB-144-EP-01S				QB-144-EP-01S
	Flash adapter	FA-100GF-8EU-A	FA-70F3733GF-8EU-MX		FA-70F3712GF-JBT-MX				FA-70F3712GF-JBT-MX
100-pin GC	Exchange adapter	QB-100GC-EA-02S	QB-100GC-EA-01S	QB-100GC-EA-01S	QB-100GC-EA-01S	QB-100GC-EA-01S		QB-100GC-EA-01S	QB-100GC-EA-01S
	Target connector	QB-100GC-TC-01S	QB-100GC-TC-01S	QB-100GC-TC-01S	QB-100GC-TC-01S	QB-100GC-TC-01S		QB-100GC-TC-01S	QB-100GC-TC-01S
	Mount adapter	QB-100GC-MA-02S	QB-100GC-MA-01S	QB-100GC-MA-01S	QB-100GC-MA-01S	QB-100GC-MA-01S		QB-100GC-MA-01S	QB-100GC-MA-01S
	Space adapter	QB-100-SA-01S	QB-100-SA-01S	QB-100-SA-01S	QB-100-SA-01S	QB-100-SA-01S		QB-100-SA-01S	QB-100-SA-01S
	Check pin adapter 1	QB-100-CA-01S	QB-100-CA-01S	QB-100-CA-01S	QB-100-CA-01S	QB-100-CA-01S		QB-100-CA-01S	QB-100-CA-01S
	Check pin adapter 2	QB-144-CA-01	QB-144-CA-01	QB-144-CA-01	QB-144-CA-01	QB-144-CA-01		QB-144-CA-01	QB-144-CA-01
	Extension probe	QB-144-EP-01S	QB-144-EP-01S	QB-144-EP-01S	QB-144-EP-01S	QB-144-EP-01S		QB-144-EP-01S	QB-144-EP-01S
	Flash adapter	FA-100GC-8EU-A	FA-70F3732GC-8EA-MX	FA-70F3707GC-8EA-MX	FA-70F3353GC-8EA-MX	FA-100GC-8EU-A		FA-70F3707GC-8EA-MX	FA-70F3353GC-8EA-MX
144-pin GJ	Exchange adapter		QB-144GJ-EA-02S	QB-144GJ-EA-03S	QB-144GJ-EA-01S		QB-144GJ-EA-01T	QB-144GJ-EA-03S	QB-144GJ-EA-01S
	Target connector		QB-144GJ-TC-01S	QB-144GJ-TC-01S	QB-144GJ-TC-01S		QB-144GJ-NQ-01T	QB-144GJ-TC-01S	QB-144GJ-TC-01S
	Mount adapter		QB-144GJ-MA-01S	QB-144GJ-MA-01S	QB-144GJ-MA-01S		QB-144GJ-HQ-01T	QB-144GJ-MA-01S	QB-144GJ-MA-01S
	Space adapter		QB-144-SA-01S	QB-144-SA-01S	QB-144-SA-01S		QB-144-YS-01T	QB-144-SA-01S	QB-144-SA-01S
	Check pin adapter 1		QB-144-CA-01S	QB-144-CA-01S	QB-144-CA-01S		-	QB-144-CA-01S	QB-144-CA-01S
	Check pin adapter 2		QB-144-CA-01	QB-144-CA-01	QB-144-CA-01			QB-144-CA-01	QB-144-CA-01
	Extension probe		QB-144-EP-01S	QB-144-EP-01S	QB-144-EP-01S		QB-208-EP-01S	QB-144-EP-01S	QB-144-EP-01S
	Flash adapter		FA-70F3724GJ-UEN-MX	FA-70F3712GJ-UEN-MX	FA-70F3368GJ-UEN-MX		FA-144GJ-UEN-A	FA-70F3712GJ-UEN-MX	FA-70F3368GJ-UEN-MX
176-pin GM	Exchange adapter			QB-176GM-EA-01S					
	Target connector			QB-176GM-TC-01S					
	Mount adapter			QB-176GM-MA-01S					
	Space adapter			QB-176-SA-01S					
	Check pin adapter 1			QB-176-CA-01S					
	Check pin adapter 2			-					
	Extension probe			QB-208-EP-02S					
	Flash adapter			FA-70F3385GM-GAB-MX					
208-pin GD	Exchange adapter						QB-208GJ-EA-01T		
	Target connector						QB-208GJ-NQ-01T		
	Mount adapter						QB-208GJ-HQ-01T		
	Space adapter						-		
	Check pin adapter 1								
	Check pin adapter 2								
	Extension probe						QB-208-EP-01S		
	Flash adapter						FA-208GD-50-WML-A		



Software & Dongles

IAR Workbench

- Integrated development environment for V850
  - C/EC++ support
  - Compiler, assembler, linker, debugger, project manager, editor
- Order code: EWV850-FULL-EE

IAR Dongles

- Optional, not mandatory
  - Support several installations for a single user
  - Easy re-installation after a memory accident on the PC
- Order code:
  - IAR-DONGLE (Parallel port interface)
  - IAR-DONGLE-USB (USB interface)

GHS Workbench

- Integrated development environment for V850
  - C/EC++ support
  - Compiler, assembler, linker, debugger, project manager, editor
- Order code: CPJW70X/NT-CDR-V85X

GHS Dongles

- Optional, not mandatory
  - Support several installations for a single user
  - Easy re-installation after a memory accident on the PC
- Order code:
  - GHS-DONGLE (Parallel port interface)
  - GHS-DONGLE-USB (USB interface)

Demo / Starter

K Series N-Wire Board

- K Series device
  - uPD70F3118GJ-UEN
  - 256 Kbytes Flash
  - 16 Kbytes RAM
- Board – EB-V850ES/KJ1+
  - Power supply (12 V DC)
  - UART cable
  - SW (various)
- Order code: EB-V850ES/KJ1+-EE

S Series N-Wire Board

- S Series device
  - uPD70F3281YGC-8EU
  - 1 x CAN,
  - 384 Kbytes Flash,
  - 32 Kbytes RAM
- Board – EB-V850ES/SG2
  - Power supply (12 V DC)
  - UART cable
  - SW (various)
- Order code: EB-V850ES/SG2-EE

F Series V850/Fx3 Can it! NEW

- Main board
  - PC connection via USB
- Daughter board
  - V850ES -> V850ES/FG3
- USB cable
- IAR workbench (size limited)
- Order code: V850FX3-CANIT

H Series N-Wire board

- H Series device
  - uPD70F3707GC
  - 100-pin
  - 256 Kbytes Flash
  - 12 Kbytes RAM
- Single board
- USB cable
  - PC connection via USB
- IAR workbench (size limited)
- Order code: EB-V850ES/HG2-EE

Programming

Flash Programmer

- Universal for all MCU Flash devices from NEC
- PC communication
  - via UART
  - via USB
- Order code: PG-FP4-E



MINICUBE 2 NEW

- Low price programmer
- Suitable for all single voltage flash devices
- Order code: QB-MINI2-EE



Universal Flash Programming Adapter for all V850 Devices of the F_Line and S_Line

- Optional access via
  - USB (PC)
  - UART (PC)
  - PG-FP4
- Order code: PG-FA-S/F_line

- A device specific mount adapter is required. It has to be ordered separately, please refer to IECUBE tool table.
- Order code: PG-FA-S/F_line



Mandatory
Optional
Alternative
Included in delivery

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