High-reliability diodes and rectifiers

Part number	Description	Radiation level	Qualification	EPPL	ESCC specification	Package	Type	V_{rrm} max. (V)	I_0 max. (A)	V_F max. @ rated I_F (V)	T_{RR} max. (ns)	T_j max. (°C)	Temperature range (°C)
Bipolar diodes													
1N6640U (*)	0.3 A, 75 V switching diode	Target: 150 krad (Si) LDR 3 Mrad HDR	ESCC	Target	-	LCC-2D	PN	75	0.3	1.060	9	175	-65 to 175
1N6642U (*)	0.3 A, 100 V switching diode	Target: 150 krad (Si) LDR 3 Mrad HDR		Target	-	LCC-2D	PN	100	0.3	1.20	9	175	
1N5806U	2.5 A fast-recovery switching rectifier	Target: 150 krad (Si) LDR 3 Mrad HDR		Y	5101/014	LCC-2A	PN	150	2.5	1.00	30	175	
1N5811U	6 A fast-recovery switching rectifier	Target: 150 krad (Si) LDR 3 Mrad HDR		Y	5101/013	LCC-2B	PN	150	6	0.95	35	175	
BYW81HR	15 A, 200 V fast-recovery power rectifier 2 x 15 A, 200 V fast-recovery power rectifier	Target: 150 krad (Si) LDR 1 Mrad HDR		Y	5103/029	SMD.5 / TO-254	Single PN Dual PN	200	1 x 15 2 x 15	1.10	40	150	-55 to 150
BYV52HR	30 A, 200 V fast-recovery power rectifier	Target: 150 krad (Si) LDR 1 Mrad HDR		Y	5103/030	TO-254	PN	200	30	1.15	55	150	
BYV54HR	40 A, 200 V fast-recovery power rectifier	Target: 150 krad (Si) LDR 1 Mrad HDR		Y	5103/031	TO-254AA	PN	200	40	1.30	60	150	
Schottky diodes													
1N5822U	3 A switching Schottky diode	Target: 150 krad (Si) LDR 3 Mrad HDR	ESCC	Target	5106/020	LCC-2B	Schottky	40	3	0.485	-	150	-55 to 150
1N5819U	1 A switching Schottky diode	Target: 150 krad (Si) LDR 3 Mrad HDR		Target	5106/021	LCC-2B	Schottky	45	1	0.49	-	150	
STPS1045HR	2 x 10 A, 45 V power Schottky rectifier	Target: 150 krad (Si) LDR 1 Mrad HDR		-	5106/017	SMD.5	Dual Schottky	45	2 x 10	0.75	-	175	
STPS6045HR	2 x 30 A, 45 V fast-recovery power rectifier	Target: 150 krad (Si) LDR 1 Mrad HDR		-	5106/018	TO-254	Dual Schottky	45	2 x 30	0.75	-	175	
STPS20100HR	20 A, 100 V power Schottky rectifier 2 x 20 A, 100 V power Schottky rectifier	Target: 150 krad (Si) LDR 1 Mrad HDR		Y	5106/016	SMD.5 / TO-254	Single Schottky Dual Schottky	100	1 x 20 2 x 20	1.00	-	175	
STPS40100HR	2 x 20 A, 100 V power Schottky rectifier	Target: 150 krad (Si) LDR 1 Mrad HDR		-	5106/019	TO-254	Dual Schottky	100	2 x 20	0.90	-	175	

Notes:
(*) Not yet qualified by agency at the date of printing
Contact ST sales office for information about the specific conditions for products in die form

Rad-hard and high-reliability bipolar transistors

Part number	Description	Radiation level	Qualification	EPPL	ESCC specification	Package	Type	V_{CEO} (V)	I_C (A)	H_{FE} min.	Temperature range (°C)
NPN bipolar transistors											
2N2219AHR	40 V, 0.8 A NPN bipolar transistor	-	ESCC	Y	5201/003	TO-39	NPN	40	0.8	100	-65 to 200
2N2222AHR	40 V, 0.8 A NPN bipolar transistor	Up to 100 krad (Si)			5201/002	LCC-3UB, LCC-3 TO-18		40	0.8	100	
2N2484HR	60 V, 0.05 A NPN bipolar transistor	-			5201/001	LCC-3UB, LCC-3 TO-18		60	0.05	100	
2N2920AHR	60 V, 0.03 A NPN dual matched bipolar transistor	-			5207/002	LCC-6, TO-77		60	0.03	300	
2N3019HR	80 V, 1 A NPN bipolar transistor	-			5201/011	TO-39		80	1	100	
2N3700HR	80 V, 1 A NPN bipolar transistor	Up to 100 krad (Si)			5201/004	LCC-3UB, LCC-3 TO-18		80	1	100	
2N5154HR	80 V, 5 A NPN bipolar transistor	-			5203/010	SMD.5, TO-257 TO-39		80	5	70	
2N5551HR	160 V, 0.5 A NPN bipolar transistor	Up to 100 krad (Si)			5201/019	LCC-3UB, LCC-3 TO-18, TO-39		150	0.5	80	
PNP bipolar transistors											
2N2907AHR	-60 V, 0.6 A PNP bipolar transistor	-	ESCC	Y	5202/001	LCC-3UB, LCC-3 TO-18	PNP	-60	-0.6	100	-65 to 200
2N3810HR	-60 V, 0.05 A PNP dual matched bipolar transistor	-			5207/005	LCC-6, TO-78		-60	-0.05	150	
2N5153HR	-80 V, 5 A PNP bipolar transistor	-			5204/002	SMD.5, TO-257 TO-39		-80	-5	70	
2N5401HR	-150 V, 0.5 A PNP bipolar transistor	Up to 100 krad (Si)			5202/014	LCC-3UB, LCC-3 TO-18		-150	-0.5	60	

Notes:
Contact ST sales office for information about the specific conditions for other bipolar part numbers and for products in die form

Rad-hard MOSFETs

Part number	Desc²ription	Radiation level	Qualification	EPPL	ESCC specification	Package	Type	V_{DSS} (V)	I_D max (A)	RDS (on) (mohm)	Qg max (nC)	Temperature range (°C)
STRH40N6 (*)	Rad-hard 60 V, 30 A N channel MOSFET	70 krad (Si) SEE characterized	ESCC	Target	-	SMD.5	N	60	30	45	52	-55 to 125
STRH100N6 (*)	Rad-hard 60 V, 80 A N channel MOSFET	100 krad (Si) SEE characterized			-	TO-254AA		60	80	13.5	161	
STRH8N10 (*)	Rad-hard 100 V, 8 A N channel MOSFET	70 krad (Si) SEE characterized			-	TO-254AA		100	8	300	22	
STRH100N10 (*)	Rad-hard 100 V, 50 A N channel MOSFET	70 krad (Si) SEE characterized			5205/021	TO-254AA		100	48	35	162	

Notes:
(*) Not yet qualified by agency at the date of printing
Contact ST sales office for information about the specific conditions for other bipolar part numbers and for products in die form

Rad-hard logic series – 54VCX series

Part number	Description	Radiation level	Qualification	EPPL	SMD / detailed specification	Package	V_{CC} (V) min	V_{CC} (V) max	V_{IN} range (V)	Other features	Temperature range (°C)
54VCX series											
54VCXH162244	16-bit non-inverting bus transceiver	300 krad (Si), SEL and SEU Immune @ 110 MeV/cm²/mg	QML-V	Y	5962F05210	Flat-48	1.65	3.60	-0.3 to 3.60	26 ohm resistors on outputs, Cold spare	-55 to 150
54VCXH162245	16-bit 3-state buffer transceiver	300 krad (Si), SEL and SEU Immune @ 110 MeV/cm²/mg			5962F05208	Flat-48					
54VCXHR162245	16-bit 3-state buffer transceiver with resistor	300 krad (Si), SEL and SEU Immune @ 110 MeV/cm²/mg			5962F05213	Flat-48					
54VCXH162373	16-bit 3-state D-type latch	300 krad (Si), SEL and SEU Immune @ 110 MeV/cm²/mg			5962F05211	Flat-48					
54VCXH162374	16-bit 3-state D-type flip-flop	300 krad (Si), SEL and SEU Immune @ 110 MeV/cm²/mg			5962F05212	Flat-48					
54VCXH163245 (*)	16-bit 3-state 3.3/1.6 bi-voltage buffer transceiver	300 krad (Si), SEL and SEU Immune @ 110 MeV/cm²/mg		Target	-	Flat-48					

Notes:
(*) Not yet qualified by agency at the date of printing
Contact ST sales office for information about the specific conditions for products in die form and QML-Q versions

Rad-hard logic series – 54AC and 54ACT series

Part number	Description	Radiation level	Qualification	EPPL	SMD / detailed specification	Package	V_{CC}		V_{IN} range	Other features	Temperature range
							(V) min	(V) max	(V)		(°C)
54AC and 54ACT series											
54AC00	Rad-hard quad 2-input NAND gate	300 krad (Si)	QML-V	Y	5962F87549	Flat-14, DIL-14	2.0	6.0	0 to V_{CC}		-55 to 150
54ACT00	Rad-hard quad 2-input NAND gate			Y	5962F87699	Flat-14, DIL-14	4.5	5.5			
54AC02	Rad-hard quad 2-input NOR gate			Y	5962F87612	Flat-14, DIL-14	2.0	6.0			
54ACT02	Rad-hard quad 2-input NOR gate			-	5962F89791	Flat-14, DIL-14	4.5	5.5			
54AC04	Rad-hard hex inverter			Y	5962F87609	Flat-14, DIL-14	2.0	6.0			
54ACT04	Rad-hard hex inverter			-	5962F89734	Flat-14, DIL-14	4.5	5.5			
54AC08	Rad-hard quad 2-input AND gate			Y	5962F87615	Flat-14, DIL-14	2.0	6.0			
54ACT08	Rad-hard quad 2-input AND gate			-	5962F89547	Flat-14, DIL-14	4.5	5.5			
54AC10	Rad-hard triple 3-input NAND gate			Y	5962F87610	Flat-14, DIL-14	2.0	6.0			
54ACT10	Rad-hard triple 3-input NAND gate			-	5962F92182	Flat-14, DIL-14	4.5	5.5			
54AC11	Rad-hard triple 3-input AND gate			Y	5962F87611	Flat-14, DIL-14	2.0	6.0			
54ACT11	Rad-hard triple 3-input AND gate			-	5962F90772	Flat-14, DIL-14	4.5	5.5			
54AC14	Rad-hard hex Schmitt inverter			Y	5962F87624	Flat-14, DIL-14	2.0	6.0			
54ACT14	Rad-hard hex Schmitt inverter			-	5962F96813	Flat-14, DIL-14	4.5	5.5			
54AC32	Rad-hard quad 2-input OR gate			-	5962F87614	Flat-14, DIL-14	2.0	6.0			
54ACT32	Rad-hard quad 2-input OR gate			-	5962F89736	Flat-14, DIL-14	4.5	5.5			
54AC74	Rad-hard dual D-type flip-flop with preset and clear			Y	5962F88520	Flat-14, DIL-14	2.0	6.0			
54ACT74	Rad-hard dual D-type flip-flop with preset and clear			-	5962F87525	Flat-14, DIL-14	4.5	5.5			
54AC86	Rad-hard quad exclusive OR			-	5962F89550	Flat-14, DIL-14	2.0	6.0			
54ACT86	Rad-hard quad exclusive OR			Y	5962F90687	Flat-14, DIL-14	4.5	5.5			
54AC138	Rad-hard 3- to 8-line decoder inverter			Y	5962F87622	Flat-16, DIL-16	2.0	6.0			

Notes:
* Not yet qualified by agency at the date of printing
Contact ST sales office for information about the specific conditions for other 54AC or 54ACT part numbers, products in die form and QML-Q versions

Rad-hard logic series – 54AC and 54ACT series (cont'd)

Part number	Description	Radiation level	Qualification	EPPL	SMD / detailed specification	Package	V_{CC} (V) min	V_{CC} (V) max	V_{IN} range (V)	Other features	Temperature range (°C)
54AC and 54ACT series											
54AC139	Rad-hard dual 2- to 4-line decoder/demultiplexer	300 krad (Si)	QML-V	Y	5962F87623	Flat-16, DIL-16	2.0	6.0	0 to V_{CC}		-55 to 150
54ACT139	Rad-hard dual 2- to 4-line decoder/demultiplexer			-	5962F87553	Flat-16, DIL-16	4.5	5.5			
54AC151	Rad-hard 8-channel multiplexer			-	5962F87691	Flat-16, DIL-16	2.0	6.0			
54ACT151	Rad-hard 8-channel multiplexer			-	5962F88756	Flat-16, DIL-16	4.5	5.5			
54AC157	Rad-hard quad 2-channel multiplexer			Y	5962F89539	Flat-16, DIL-16	2.0	6.0			
54ACT157	Rad-hard quad 2-channel multiplexer			-	5962F89668	Flat-16, DIL-16	4.5	5.5			
54AC161	Rad-hard synchronous binary counter with asynchronous clear			Y	5962F89561	Flat-16, DIL-16	2.0	6.0			
54ACT161	Rad-hard synchronous binary counter with asynchronous clear			-	5962F91722	Flat-16, DIL-16	4.5	5.5			
54AC174	Rad-hard hex D-type flip-flop with clear			-	5962F87626	Flat-16, DIL-16	2.0	6.0			
54ACT174	Rad-hard hex D-type flip-flop with clear			-	5962F87757	Flat-16, DIL-16	4.5	5.5			
54AC191	Rad-hard 4-bit synchronous binary up/down counter			-	5962F89749	Flat-16, DIL-16	2.0	6.0			
54ACT191	Rad-hard 4-bit synchronous binary up/down counter			-	5962F04228	Flat-16, DIL-16	4.5	5.5			
54AC240	Rad-hard octal bus 3-state buffer inverter			Y	5962F87550	Flat-20	2.0	6.0			
54ACT240	Rad-hard octal bus 3-state buffer inverter			Y	5962F87759	Flat-20	4.5	5.5			
54AC244	Rad-hard octal bus 3-state buffer			Y	5962F87552	Flat-20	2.0	6.0		Inverted enables	
54ACT244	Rad-hard octal bus 3-state buffer			Y	5962F87760	Flat-20	4.5	5.5			
54AC245	Rad-hard octal bus 3-state transceiver			Y	5962F87758	Flat-20	2.0	6.0			
54ACT245	Rad-hard octal bus 3-state transceiver			Y	5962F87663	Flat-20	4.5	5.5			
54AC273	Rad-hard octal D-type flip-flop with clear			Y	5962F87756	Flat-20	2.0	6.0			
54ACT273	Rad-hard octal D-type flip-flop with clear			-	5962F01527	Flat-20	4.5	5.5			
54AC373	Rad-hard octal D-type 3-state latch			Y	5962F87555	Flat-20	2.0	6.0			
54ACT373	Rad-hard octal D-type 3-state latch			-	5962F87556	Flat-20	4.5	5.5			

54AC374	Rad-hard octal D-type 3-state flip-flop			Y	5962F87694	Flat-20	2.0	6.0		
54ACT374	Rad-hard octal D-type 3-state flip-flop			-	5962F87631	Flat-20	4.5	5.5		
54AC521	Rad-hard 8-bit comparator with enable			-	5962F87695	Flat-20	2.0	6.0		
54AC540	Rad-hard octal 3-state buffer/line driver			-	5962F90985	Flat-20	2.0	6.0		
54AC541	Rad-hard octal bus 3-state buffer			Y	5962F88706	Flat-20	2.0	6.0		Non inverted enables
54ACT541	Rad-hard octal bus 3-state buffer			-	5962F89795	Flat-20	4.5	5.5		
54AC574	Rad-hard octal D-type 3-state flip-flop			-	5962F96773	Flat-20	2.0	6.0		
54ACT574	Rad-hard octal D-type 3-state flip-flop			Y	5962F89601	Flat-20	4.5	5.5		
54AC2525 (*)	Rad-hard 1-to-8 skew clock driver			-	5962F92174	Flat-48	2.0	6.0		
54AC16244	Rad-hard 16-bit bus non-inverting transceiver			-	5962F04210	Flat-48	2.0	6.0		
54ACT16244	Rad-hard 16-bit bus non-inverting transceiver			-	5962F92022	Flat-48	4.5	5.5		
54AC16245	Rad-hard 16-bit bus transceiver 3-state inverting			-	5962F04211	Flat-48	2.0	6.0		
54ACT16245	Rad-hard 16-bit 3-state buffer transceiver			-	5962F92023	Flat-48	4.5	5.5		
54AC16373	Rad-hard 16 D-type 3-state latch			-	5962F04212	Flat-48	2.0	6.0		
54ACT16373	Rad-hard 16-bit 3-state D-type latch			-	5962F92024	Flat-48	4.5	5.5		
54AC16374	Rad-hard 16 D-type 3-state flip-flop			-	5962F04213	Flat-48	2.0	6.0		
54ACT16374	Rad-hard 16-bit 3-state D-type flip-flop			-	5962F92025	Flat-48	4.5	5.5		
54AC164245	Rad-hard 16-bit 3 to 5 V level shifter 3-state transceiver	100 krad (Si)		-	5962R98580	Flat-48	2.3	6.0		

Notes:
(*) Not yet qualified by agency at the date of printing
Contact ST sales office for information about the specific conditions for other 54AC or 54ACT part numbers, products in die form and QML-Q versions

Rad-hard logic series – 54HC and 54HCT series

Part number	Description	Radiation level	Qualification	EPPL	ESCC specification	Package	V_{CC} (V) min	V_{CC} (V) max	V_{IN} range (V)	Other features	Temperature range (°C)
54HC and 54HCT series											
M54HC00	Quad 2-input NAND gate			Y	9201/105	Flat-14, DIL-14	2.0	6.0			
M54HC02	Quad 2-input NOR gate			Y	9201/113	Flat-14, DIL-14	2.0	6.0			
M54HC03	Quad 2-input NAND open drain			Y	9201/114	Flat-14, DIL-14	2.0	6.0			
M54HC04	Hex inverter			Y	9401/033	Flat-14, DIL-14	2.0	6.0			
M54HCU04	Single-stage hex inverter			-	9401/055	Flat-14, DIL-14	4.5	5.5		Unbuffered output	
M54HC08	Quad 2-input AND gate			Y	9201/106	Flat-14, DIL-14	2.0	6.0			
M54HC10	Triple 3-input NAND gate			Y	9201/107	Flat-14, DIL-14	2.0	6.0			
M54HC11	Triple 3-input AND gate			Y	9201/117	Flat-14, DIL-14	2.0	6.0			
M54HC14	Hex Schmitt inverter			Y	9409/007	Flat-14, DIL-14	2.0	6.0			
M54HC20	Dual 4-input NAND gate			Y	9201/118	Flat-14, DIL-14	2.0	6.0			
M54HC21	Dual 4-input AND gate			Y	9201/108	Flat-14, DIL-14	2.0	6.0			
M54HC27	Triple 3-input NOR gate			Y	9201/109	Flat-14, DIL-14	2.0	6.0			
M54HC30	8-input NAND gate			-	9201/110	Flat-14, DIL-14	2.0	6.0			
M54HC32	Quad 2-input OR gate			Y	9201/111	Flat-14, DIL-14	2.0	6.0			
M54HC73	Dual J-K flip-flop with clear			-	9203/071	Flat-14, DIL-14	2.0	6.0		Negative-edge	
M54HC74	Dual D-type flip-flop with preset and clear			Y	9203/050	Flat-14, DIL-14	2.0	6.0		Positive-edge	
M54HCT74	Dual D-type flip-flop with preset and clear			Y	9203/070	Flat-14, DIL-14	4.5	5.5		Positive-edge TTL ccompatible	
M54HC75	4-bit D-type latch			-	9203/065	Flat-16, DIL-16	2.0	6.0			
M54HC85	4-bit magnitude comparator			Y	9209/004	Flat-16, DIL-16	2.0	6.0			
M54HC86	Quad exclusive OR gate			Y	9201/119	Flat-14, DIL-14	2.0	6.0		pinout 1	
M54HC109	Dual J-K flip-flop with preset and clear			Y	9306/048	Flat-16, DIL-16	2.0	6.0		Positive-edge	
M54HC123	Dual retriggerable monostable multivibrator with clear			-	9207/006	Flat-16, DIL-16	2.0	6.0			

M54HC125	Quad bus 3-state buffer	50 krad (Si)	ESCC	Y	9401/039	Flat-14	2.0	6.0	0 to V_{CC}	Inverted enables	-55 to 125
M54HC132	Quad 2-input Schmitt NAND gate			Y	9201/120	Flat-14, DIL-14	2.0	6.0		
M54HC137	3- to 8-line decoder latch inverter			-	9205/013	Flat-16, DIL-16	2.0	6.0		
M54HC138	3- to 8-line decoder inverter			Y	9408/046	Flat-16, DIL-16	2.0	6.0		
M54HC139	Dual 2- to 4-line decoder/demultiplexer			Y	9205/017	Flat-16, DIL-16	2.0	6.0		
M54HC148	8- to 3-line priority encoder			-	9410/017	Flat-16, DIL-16	2.0	6.0		
M54HC151	8-channel multiplexer			Y	9408/054	Flat-16, DIL-16	2.0	6.0		
M54HC153	Dual 4-channel multiplexer			-	9408/038	Flat-16, DIL-16	2.0	6.0		
M54HC154	4- to 16-line decoder/demultiplexer			Y	9205/023	Flat-24, DIL-24	2.0	6.0		
M54HC157	Quad 2-channel multiplexer			Y	9408/057	Flat-16, DIL-16	2.0	6.0		
M54HC158	Quad 2-channel multiplexer inverter			Y	9408/059	Flat-16, DIL-16	2.0	6.0		
M54HC160	Synchronous decade counter with async clear			-	9205/062	DIL-16	2.0	6.0		
M54HC161	Synchronous binary counter with async clear			Y	9204/059	Flat-16, DIL-16	2.0	6.0		
M54HC163	Synchronous binary counter with sync clear			Y	9204/073	Flat-16, DIL-16	2.0	6.0		
M54HC164	8-bit SIPO shift register			Y	9306/041	Flat-14, DIL-14	2.0	6.0		
M54HC165	8-bit PISO shift register			Y	9306/042	Flat-16, DIL-16	2.0	6.0		
M54HC166	8-bit PISO shift register with clear			Y	9306/043	Flat-16, DIL-16	2.0	6.0		
M54HC174	Hex D-type flip-flop with clear			Y	9306/052	Flat-16, DIL-16	2.0	6.0		
M54HC175	Quad D-type flip-flop with clear			Y	9203/052	Flat-16, DIL-16	2.0	6.0		
M54HC191	4-bit synchronous binary up/down counter			Y	9204/066	Flat-16, DIL-16	2.0	6.0		
M54HC193	Synchronous up/down binary counter			Y	9204/065	Flat-16, DIL-16	2.0	6.0		
M54HC194	4-bit PIPO shift register			-	9306/047	Flat-16, DIL-16	2.0	6.0		4 shift modes	
M54HC237	3- to 8-line decoder latch			Y	9205/021	Flat-16, DIL-16	2.0	6.0			
M54HC238	3- to 8-line decoder			Y	9205/016	Flat-16, DIL-16	2.0	6.0			
M54HC240	Octal bus 3-state buffer inverter			Y	9401/034	Flat-20, DIL-20	2.0	6.0		Independent enables - TTL compatible	

Notes:
Contact ST sales office for information about the specific conditions for other 54HC or 54HCT part numbers, products in die form

Rad-hard logic series – 54HC and 54HCT series (cont'd)

Part number	Description	Radiation level	Qualification	EPPL	ESCC specification	Package	V_{CC} (V) min	V_{CC} (V) max	V_{IN} range (V)	Other features	Temperature range (°C)
54HC and 54HCT series											
M54HCT240	Octal bus 3-state buffer inverter			Y	9401/045	Flat-20, DIL-20	4.5	5.5			
M54HC241	Octal bus 3-state buffer			-	9401/035	Flat-20, DIL-20	2.0	6.0		Complementary enables	
M54HC244	Octal bus 3-state buffer			Y	9401/048	Flat-20, DIL-20	2.0	6.0		Inverted enables	
M54HCT244	Octal bus 3-state buffer			Y	9402/009	Flat-20, DIL-20	4.5	5.5		Inverted enables TTL compatible	
M54HC245	Octal bus 3-state transceiver			Y	9405/013	Flat-20, DIL-20	2.0	6.0			
M54HCT245	Octal bus 3-state transceiver			Y	9405/014	Flat-20, DIL-20	4.5	5.5		TTL compatible	
M54HC251	8-channel 3-state multiplexer			-	9408/048	Flat-16, DIL-16	2.0	6.0			
M54HC253	Dual 4-channel 3-state multiplexer			-	9408/058	Flat-16, DIL-16	2.0	6.0			
M54HC257	Quad 2-channel 3-state multiplexer			Y	9408/047	Flat-16	2.0	6.0			
M54HC259	8-bit adressable latch			-	9203/073	Flat-16, DIL-16	2.0	6.0			
M54HC273	Octal D-type flip-flop with clear			Y	9203/053	Flat-20, DIL-20	2.0	6.0			
M54HC283	4-bit binary full adder			Y	9202/075	Flat-16, DIL-16	2.0	6.0			
M54HC365	Hex bus 3-state buffer			-	9401/052	Flat-16, DIL-16	2.0	6.0			
M54HC367	Hex bus 3-state buffer			-	9401/044	Flat-16, DIL-16	2.0	6.0		Independent enables	
M54HC373	Octal D-type 3-state latch			Y	9203/059	Flat-20, DIL-20	2.0	6.0			
M54HCT373	Octal D-type 3-state latch			Y	9203/064	Flat-20, DIL-20	4.5	5.5		TTL compatible	
M54HC374	Octal D-type 3-state flip-flop			Y	9203/060	Flat-20, DIL-20	2.0	6.0			
M54HCT374	Octal D-type 3-state flip-flop			Y	9203/066	Flat-20, DIL-20	4.5	5.5		TTL compatible	
M54HC390	Dual decade counter			-	9204/078	Flat-16, DIL-16	2.0	6.0			
M54HC393	Dual binary counter			-	9204/074	Flat-14, DIL-14	2.0	6.0			
M54HC540	Octal bus 3-state buffer inverter			Y	9401/049	Flat-20, DIL-20	2.0	6.0			
M54HC541	Octal bus 3-state buffer	50 krad (Si)	ESCC	Y	9401/047	Flat-20, DIL-20	2.0	6.0	0 to V_{CC}	Non-inverted enables	-55 to 125

M54HC573	Octal D-type 3-state latch			Y	9202/072	Flat-20, DIL-20	2.0	6.0		Through-chip pinout	
M54HC574	Octal D-type 3-state flip-flop			Y	9203/054	Flat-20, DIL-20	2.0	6.0		Through-chip pinout	
M54HC590	8-bit binary 3-state counter register			Y	9204/071	Flat-16, DIL-16	2.0	6.0			
M54HC595	8-bit shift register 3-state output latch			Y	9306/051	Flat-16, DIL-16	2.0	6.0			
M54HC597	8-bit latch/shift register			Y	9306/054	Flat-16, DIL-16	2.0	6.0			
M54HC688	8-bit equality comparator			Y	9209/005	Flat-20, DIL-20	2.0	6.0			
M54HC4002	Dual 4-input NOR gate			-	9201/130	Flat-14, DIL-14	2.0	6.0			
M54HC4020	14-stage binary counter			-	9204/070	Flat-16, DIL-16	2.0	6.0			
M54HC4040	12-stage binary counter			Y	9204/069	Flat-16, DIL-16	2.0	6.0			
M54HC4049	Hex buffer/converter (inverter)			Y	9401/037	Flat-16, DIL-16	2.0	6.0			
M54HC4050	Hex buffer/converter			Y	9401/038	Flat-16, DIL-16	2.0	6.0			
M54HC4051	Single 8-channel analog mux/demux			-	9408/064	Flat-16, DIL-16	2.0	6.0			
M54HC4053	Triple 2-channel analog mux/demux			-	9408/065	Flat-16, DIL-16	2.0	6.0			
M54HC4060	14-stage binary counter/oscillator			-	9204/076	Flat-16, DIL-16	2.0	6.0			
M54HC4066	Quad bilateral switch			-	9408/052	Flat-14, DIL-14	2.0	6.0			
M54HC4072	Dual 4-input OR gate			-	9201/124	Flat-14, DIL-14	2.0	6.0			
M54HC4075	Triple 3-input OR gate			-	9201/129	Flat-14, DIL-14	2.0	6.0			
M54HC4078	8-input NOR/OR gate			-	9201/123	Flat-14, DIL-14	2.0	6.0			
M54HC4094	8-bit SIPO 3-state shift register			-	9306/050	Flat-16, DIL-16	2.0	6.0			
M54HC4514	4- to 16-line decoder latch			-	9205/019	Flat-24, DIL-24	2.0	6.0			

Notes:
Contact ST sales office for information about the specific conditions for other 54HC or 54HCT part numbers, products in die form

Rad-hard logic series – CMOS4000 series

Part number	Description	Radiation level	Qualification	EPPL	ESCC specification	Package	V_{CC} (V) min	V_{CC} (V) max	V_{IN} range (V)	Temperature range (°C)
CMOS4000 series										
HCC4001B	Quad 2-input NOR gate			Y	9201/041	Flat-14, DIL-14				
HCC4002B	Dual 4-input NOR gate			-	9201/042	Flat-14, DIL-14				
HCC4008B	4-Bit full adder			-	9202/039	Flat-16, DIL-16				
HCC4011B	Quad 2-input NAND gate			Y	9201/043	Flat-14, DIL-14				
HCC4012B	Dual 4-input NAND gate			-	9201/044	Flat-14, DIL-14				
HCC4013B	Dual D flip-flop			Y	9203/023	Flat-14, DIL-14				
HCC4014B	8-stage static synchronous shift register			Y	9306/014	Flat-16, DIL-16				
HCC4015B	Dual 4-stage static shift register			Y	9306/015	Flat-16, DIL-16				
HCC4016B	Quad bilateral switch			-	9202/050	Flat-14, DIL-14				
HCC4017B	decade counter/divider			Y	9204/020	Flat-16, DIL-16				
HCC4018B	Presettable divide-by-n counter			-	9204/021	Flat-16, DIL-16				
HCC4019B	Quad AND/OR select gate			Y	9202/051	Flat-16, DIL-16				
HCC4020B	14-stage binary/ripple counter			Y	9204/022	Flat-16, DIL-16				
HCC4021B	8-stage static shift register			Y	9306/016	Flat-16, DIL-16				
HCC4022B	Divide-by-8 counter/divider			-	9204/023	Flat-16, DIL-16				
HCC4023B	Triple 3-input NAND gate			Y	9201/045	Flat-14, DIL-14				
HCC4024B	7-stage binary/ripple counter			Y	9204/024	Flat-14, DIL-14				
HCC4025B	Triple 3-input NOR gate			-	9201/046	Flat-14, DIL-14				
HCC4027B	Dual J-K master-slave flip-flop			Y	9203/022	Flat-16, DIL-16				
HCC4028B	BCD-to-decimal decoder			Y	9205/010	Flat-16, DIL-16				
HCC4029B	Presettable up/down counter			Y	9204/025	Flat-16, DIL-16				
HCC4030B	Quad exclusive OR gate			Y	9201/047	Flat-14, DIL-14				

HCC4034B	8-stage static bidirectional bus register	100 krad (Si)	ESCC	-	9306/025	Flat-24, DIL-24	3.0	20.0	0 to V_{cc}	-55 to 125
HCC4035B	4-stage parallel I/O shift register			Y	9306/018	Flat-16, DIL-16				
HCC4040B	12-stage binary/ripple counter			Y	9204/026	Flat-16, DIL-16				
HCC4041UB	Quad true/complement buffer			-	9202/040	Flat-14, DIL-14				
HCC4042B	Quad clocked D latch			-	9202/041	Flat-16, DIL-16				
HCC4043B	Quad 3-state NOR R/S latch			-	9202/042	Flat-16, DIL-16				
HCC4044B	Quad 3-state NAND R/S latch			-	9202/043	Flat-16, DIL-16				
HCC4046B	Micropower phase locker loop			-	9202/044	Flat-16, DIL-16				
HCC4047B	Monostable/astable multivibrator			Y	9207/003	Flat-14, DIL-14				
HCC4049UB	Hex inverting buffer/converter			Y	9202/045	Flat-16, DIL-16				
HCC4050B	Hex non-inverting buffer/converter			Y	9202/046	Flat-16, DIL-16				
HCC4051B	Single 8-channel analog mux/demux			Y	9202/047	Flat-16, DIL-16				
HCC4052B	Different 4-channel analog mux/demux			-	9202/048	Flat-16, DIL-16				
HCC4053B	Triple 2-channel analog mux/demux			-	9202/049	Flat-16, DIL-16				
HCC4060B	14-stage counter/divider AND oscillator			-	9204/052	Flat-16, DIL-16				
HCC4063B	4-bit magnitude comparator			Y	9209/001	Flat-16, DIL-16				
HCC4066B	Quad bilateral switch			Y	9408/005	Flat-14, DIL-14				
HCC4067B	Single 16-channel analog mux/demux			-	9408/009	Flat-24, DIL-24				
HCC4068B	8-input NAND/AND gate			-	9201/061	Flat-14, DIL-14				
HCC4069UB	Hex inverter			Y	9401/010	Flat-14, DIL-14				
HCC4070B	Quad exclusive OR gate			-	9201/048	Flat-14, DIL-14				
HCC4071B	Quad 2-input OR gate			Y	9201/063	Flat-14, DIL-14				
HCC4072B	Dual 4-input OR gate			-	9201/082	Flat-14, DIL-14				
HCC4073B	Triple 3-input AND gate			Y	9201/064	Flat-14, DIL-14				
HCC4075B	Triple 3-input OR gate			-	9201/065	Flat-14, DIL-14				

Notes:
Contact ST sales office for information about the specific conditions for other HCC4xxx part numbers and for products in die form

Rad-hard logic series – CMOS4000 series (cont'd)

Part number	Description	Radiation level	Qualification	EPPL	ESCC specification	Package	V_{CC} (V) min	V_{CC} (V) max	V_{IN} range (V)	Temperature range (°C)
CMOS4000 series										
HCC4076B	4-bit D-type register	100 krad (Si)	ESCC	Y	9306/022	Flat-16, DIL-16	3.0	20.0	0 to V_{CC}	-55 to 125
HCC4077B	Quad exclusive NOR gate			-	9201/055	Flat-14, DIL-14				
HCC4078B	8-input NOR/OR gate			-	9201/062	Flat-14, DIL-14				
HCC4081B	Quad 2-input AND gate			Y	9201/052	Flat-14, DIL-14				
HCC4082B	Dual 4-input AND gate			-	9201/066	Flat-14, DIL-14				
HCC4093B	Quad 2-input NAND Schmitt trigger			Y	9409/002	Flat-14, DIL-14				
HCC4094B	8-stage shift-and-store bus register			Y	9306/026	Flat-16, DIL-16				
HCC4098B	Dual monostable multivibrator			-	9206/002	Flat-16, DIL-16				
HCC4099B	8-bit addressable latch			Y	9202/058	Flat-16, DIL-16				
HCC40103B	Presettable 8-bit binary down counter			Y	9204/036	Flat-16, DIL-16				
HCC40106B	Hex Schmitt trigger			Y	9409/005	Flat-14, DIL-14				
HCC40107B	Dual 2-input NAND buffer/divider			Y	9401/013	Flat-14, DIL-14				
HCC40109B	Quad low-to-high voltage level shifter			Y	9407/003	Flat-16, DIL-16				
HCC40161B	Binary counter with asynchronous clear			Y	9204/054	Flat-16, DIL-16				
HCC40174B	Hex D flip-flop			Y	9203/038	Flat-16, DIL-16				
HCC40193B	Presettable 4-bit binary up/down counter			-	9204/041	Flat-16, DIL-16				
HCC4502B	Strobed hex inverter/buffer			Y	9401/006	Flat-16, DIL-16				
HCC4503B	Hex 3-state non-inverter buffer			Y	9401/030	Flat-16, DIL-16				
HCC4508B	Dual 4-bit latch with 3-state output			Y	9202/063	Flat-24, DIL-24				
HCC4512B	8-channel data selector with 3-state output			Y	9408/006	Flat-16, DIL-16				
HCC4514B	4-bit latch/4- to 16-line decoder with output high			-	9408/012	Flat-24, DIL-24				
HCC4515B	4-bit latch/4- to 16-line decoder with output low			-	9205/011	Flat-24, DIL-24				

HCC4516B	Presettable 4-bit binary up/down counter			-	9204/045	Flat-16, DIL-16						
HCC4520B	Dual binary up/down counter			-	9204/028	Flat-16, DIL-16						
HCC4532B	8-input priority encoder			-	9202/065	Flat-16, DIL-16						
HCC4538B	Dual precision monostable multivibrator			-	9207/007	Flat-16, DIL-16						
HCC4555B	Dual 1-of-4 decoder/demux with output high			Y	9408/011	Flat-16, DIL-16						
HCC4556B	Dual 1-of-4 decoder/demux with output low			-	9408/025	Flat-16, DIL-16						

Notes:
Contact ST sales office for information about the specific conditions for other HCC4xxx part numbers and for products in die form

Rad-hard voltage regulators

Part number	Description	Radiation level	Qualification	EPPL	SMD / detailed specification	Package	V_{IN} (V)		I_{OUT} max.	V_{OUT} (V)		V_{DROP}	Inhibit pin	Temperature range (°C)
							min	max	(A)	min	max	typ (V)		
RHFL4913XXX15 (*)	1.5 V fixed positive voltage regulator	300 krad (Si) high and low dose rate, ELDRS free, SEL free @ 68 MeV.cm²/mg	QML-V	Target	-	SMD.5 Flat-16 TO-257	3 (1)	12	3	1.47	1.53	0.35 V @ 0.4 A 0.75 V @ 2 A	Y	-55 to 150
RHFL4913XXX25	2.5 V fixed positive voltage regulator	300 krad (Si) high and low dose rate, ELDRS free, SEL free @ 68 MeV.cm²/mg		Y	5962F02534	SMD.5 Flat-16 TO-257				2.45	2.55	0.35 V @ 0.4 A 0.75 V @ 2 A	Y	
RHFL4913XXX33	3.3 V fixed positive voltage regulator	300 krad (Si) high and low dose rate, ELDRS free, SEL free @ 68 MeV.cm²/mg		Y	5962F02535	SMD.5 Flat-16 TO-257				3.23	3.37	0.35 V @ 0.4 A 0.75 V @ 2 A	Y	
RHFL4913XXX50	5.0 V fixed positive voltage regulator	300 krad (Si) high and low dose rate, ELDRS free, SEL free @ 68 MeV.cm²/mg		Y	5962F02536	SMD.5 Flat-16 TO-257				4.90	5.10	0.35 V @ 0.4 A 0.75 V @ 2 A	Y	
RHFL4913A	Adjustable positive voltage regulator	300 krad (Si) high and low dose rate, ELDRS free, SEL free @ 68 MeV.cm²/mg		Y	5962F02524	Flat-16 SMD5C				1.23	9.00	0.35 V @ 0.4 A 0.90 V @ 2 A	Y	
RHFL7913A	Adjustable negative voltage regulator	300 krad (Si) high and low dose rate, ELDRS free, SEL free @ 68 MeV.cm²/mg		Y	5962F02532	Flat-16 SMD5C	-12	-1.30	-2	-9.50	-1.20	0.5 V @ -0.4 A 0.8 V @ -1 A	Y	

Notes:
(*) Not yet qualified by agency at the date of printing
(1) V_{IN} min can be as low as 2.5 V in some conditions
Contact ST sales office for information about the specific conditions for products in die form and QML-Q versions

Rad-hard operational amplifiers

Part number	Description	Radiation level	Qualification	EPPL	SMD / detailed specification	Package	Number of operators	V_{CC} (V)		Bandwidth	Slew rate typ.	Supply current	Rail-to-rail in/out	Input offset V_{IO} typ	Temperature range
								min.	max.	(MHz)	(V/µs)	Typ (mA)		(µV)	(°C)
RHF43B	Precision single op-amp	300 krad (Si) - ELDRS free SEL immune @ 110 MeV.cm²/mg @ 125 °C SET report available upon request	QML-V	Y	5962F06237	Flat-8	1	3.0	16.0	8	3	2.2	No/yes	100	-55 to 125
RHF310	Low-power high-speed single op-amp	300 krad (Si) - ELDRS free SEL immune @ 110 MeV.cm²/mg @ 125 °C SET Report available upon request	QML-V	Target	5962F07233	Flat-8S	1	4.5	5.5	120	115	0.4	No/no	3.5	
RHF330	1 GHz low-noise single op-amp	300 krad (Si) - ELDRS free SEL immune @ 110 MeV.cm²/mg @ 125 °C SET report available upon request	QML-V	Target	5962F07231	Flat-8S	1	4.5	5.5	1000	1800	16.6	No/no	180	
RHF350 (*)	550 MHz single op-amp	300 krad (Si) - ELDRS free SEL immune @ 110 MeV.cm²/mg @ 125 °C SET report available upon request	QML-V	Target	-	Flat-8S	1	4.5	5.5	550	940	4.1	No/no	800	
RHF484 (*)	Precision quad op-amp	300 krad (Si) - ELDRS free SEL immune @ 110 MeV.cm²/mg @ 125 °C SET report available upon request	QML-V	Target	-	Flat-14	4	3.0	16.0	8	3	2.2	No/yes	100	

Notes:
(*) Not yet qualified by agency at the date of printing
Contact ST sales office for information about the specific conditions for products in die form and QML-Q versions

Rad-hard A/D converters

Part number	Description	Radiation level	Qualification	EPPL	SMD / detailed specification	Package	V_{CC} (V)		Resolution bit	Effective resolution bit	Sampling frequency max.	Number of channels	Power @ full speed (mW)	Differential input	Input amplitude V_{PP} (V)	Temperature range (°C)
							min.	max.								
RHF1201	12-bit 50 MSPS 100 mW ADC	300 krad (Si) - high and low dose rate SEFI and SEL Immune @ 110 MeV/cm²/mg @ 125 °C	QML-V	Y	5962F05217	SO-48	2.3	2.7	12	10.3	50 MSPS	1	100	Yes	2.0	-55 to 125
RHF1401	14-bit 30 MSPS 85 mW ADC	300 krad (Si) - high and low dose rate SEFI and SEL Immune @ 110 MeV/cm²/mg @ 125 °C	QML-V	Y	5962F06260	SO-48	2.3	2.7	14	11.7	30 MSPS	1	85	Yes	2.0	

Notes:
Contact ST sales office for information about the specific conditions for products in die form and QML-Q versions