

# Product Catalogue

## Product Lists

**2020-2021**



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Series name	Features	Release delay	Detection voltage range	Detection voltage step	Detection voltage accuracy	Current consumption (typ.)	Operating voltage range	Operating temperature range	Package							Page
									SNT-4A	SNT-6A	SC-82AB	SOT-23-5	SOT-23-6	SOT-89-3	TO-92	
S-1000	VDD detection, Super-low current consumption of 350nA	No delay	1.5 to 4.6V	0.1V	±1.0%	350nA	0.95 to 5.5V	-40 to +85°C	●	●	●					2-18
S-808xxC (-V <sub>DET</sub> ≤ 1.4V)	VDD detection, Wide detection voltage range	No delay	0.8 to 1.4V	0.1V	±2.0%	1.3μA	0.65 to 5.0V	-40 to +85°C	●		●					2-18
S-808xxC (-V <sub>DET</sub> ≥ 1.5V)		No delay	1.5 to 6.0V	0.1V	±2.0%	0.8μA	0.95 to 10V	-40 to +85°C	●		●	●		●	●	
S-1009	VDD detection, Super-low current consumption of 270nA	External setting	0.8 to 4.6V	0.1V	±0.5% <sup>*1</sup>	270nA <sup>*2</sup>	0.6 to 10V <sup>*3</sup>	-40 to +85°C <sup>*4</sup>	●		●	●				2-18
S-809xxC (-V <sub>DET</sub> ≤ 1.4V)	VDD detection, Release delay time external setting	External setting	1.3 to 1.4V	0.1V	±2.0%	1.0μA	0.7 to 10V	-40 to +85°C	●		●	●				2-19
S-809xxC (-V <sub>DET</sub> ≥ 1.5V)		External setting	1.5 to 6.0V	0.1V	±2.0%	1.1μA	0.7 to 10V	-40 to +85°C	●		●	●				
S-801	VDD detection, Release delay time internal setting	Internal setting	2.2 to 6.0V	0.1V	±2.0%	1.3μA	0.95 to 10V	-40 to +85°C	●			●				2-19
S-1003	VDD detection, Manual reset	External setting	1.2 to 5.0V	0.1V	±1.0% <sup>*5</sup>	500nA	0.95 to 10V	-40 to +85°C		●		●				2-19
S-1002	SENSE detection	No delay	1.0 to 5.0V	0.1V	±1.0% <sup>*5</sup>	500nA	0.95 to 10V	-40 to +85°C			●	●				2-20
S-1004	SENSE detection	External setting	1.0 to 5.0V	0.1V	±1.0% <sup>*5</sup>	500nA	0.95 to 10V	-40 to +85°C		●		●				2-20
S-1011A/C/J/L	VDD detection, High-withstand voltage	External setting <sup>*6</sup>	3.6 to 10.0V	0.05V	±1.5% <sup>*7</sup>	600nA	1.8 to 36V	-40 to +85°C					●			2-20
S-1011E/G/N/Q	SENSE detection, High-withstand voltage	External setting <sup>*6</sup>	3.0 to 10.0V	0.05V	±1.5% <sup>*7</sup>	550nA	3.0 to 36V	-40 to +85°C					●			

\*1: Products of detection voltage 2.4V or higher \*2:  $1.2V \leq -V_{DET} < 2.3V$  \*3: CMOS output product \*4: Products that support +105°C are also available. Contact our sales representatives for details.

\*5: Products of detection voltage 2.2V or higher \*6: External setting of detection delay time is possible. \*7: Products of detection voltage 5.0V or higher

## Watchdog Timers

Series name	Watchdog mode	Detection voltage	Accuracy	Input voltage	Current consumption (typ.)	Package		Page
						TMSOP-8	HSNT-8(2030)	
S-1410	Window mode, time-out mode	2.0 to 5.0V	±1.5%	0.9 to 6.0V	3.8μA	●	●	2-21
S-1411	Fixed to window mode	2.0 to 5.0V	±1.5%	0.9 to 6.0V	3.8μA	●	●	2-21

Type	Series name	Features		Input voltage range	Output current <sup>*1</sup> (reference)	Transistor	Control method	Synchronous	Output voltage range	Operation frequency (kHz)		Current consumption		Efficiency <sup>*1</sup>	Protection circuit		Package								Page																	
										Low frequency	High frequency	During operation (typ.)	During shutdown (max.)		Ceramic <sup>*2</sup>	Short-circuit protection	Overcurrent protection	TS <sup>*3</sup>	SOT-89-3	SOT-23-3	SOT-23-5	SOT-23-6	HTMSOP-8	8-Pin TSSOP		SNT-6A	HSNT-6(2025)	SNT-8A	HSNT-8(2030)	WLP-6L												
Step-down	S-8580	High-withstand voltage	Responsive	4.0 to 36V	Up to 600mA	Built-in	PWM	●	2.5 to 12V (External setting)	400	2200	150μA (400kHz) <sup>*4</sup>	1μA	95% <sup>*5</sup>	●	●	●	●			●																			3-3		
	S-8581	High-withstand voltage	High efficiency	Responsive	4.0 to 36V	Up to 600mA	Built-in	PWM/PFM	●	2.5 to 12V (External setting)	400	2200	68μA	1μA	95% <sup>*5</sup>	●	●	●	●			●				●		●		●										3-3		
	S-8590	Medium-withstand voltage	Responsive		4.0 to 18V	Up to 600mA	Built-in	PWM	●	1.0 to 12V (2.2MHz) (External setting) <sup>*6</sup>	400	2200	150μA (400kHz) <sup>*4</sup>	1μA	95% <sup>*5</sup>	●	●	●	●			●				●		●		●										3-4		
	S-8591	Medium-withstand voltage	High efficiency	Responsive	4.0 to 18V	Up to 600mA	Built-in	PWM/PFM	●	1.0 to 12V (2.2MHz) (External setting) <sup>*6</sup>	400	2200	68μA	1μA	95% <sup>*5</sup>	●	●	●	●			●				●		●		●										3-4		
	S-8533	Medium-withstand voltage			2.7 to 16V	Up to 3A	External	PWM	●	1.25 to 6.0V	300		30μA	1μA	95%										●															3-5		
	S-8520	Medium-withstand voltage			2.5 to 16 or 10V	Up to 1A	External	PWM		1.5 to 6.0V	60	180	300	10μA (60kHz)	0.5μA	93%							●																	3-5		
	S-8521	Medium-withstand voltage	High efficiency		2.5 to 16 or 10V	Up to 1A	External	PWM/PFM		1.5 to 6.0V	60	180	300	10μA (60kHz)	0.5μA	93%							●																	3-5		
	S-85M1A	Ultra-high efficiency	Small WLP	Responsive	2.2 to 5.6V	Up to 200mA	Built-in	PWM/PFM	●	0.7 to 3.9V		1000		260nA	100nA	93%	●	●	●	●																				3-5		
	S-85M0A	Ultra-high efficiency	Small WLP	Responsive	2.2 to 5.6V	Up to 50mA	Built-in	PFM	●	0.7 to 3.9V		—		260nA	100nA	91%	●	●	●	●																					3-6	
	S-8550	Responsive			2.0 to 5.5V	Up to 600mA	Built-in	PWM	●	1.1 to 4.0V (External setting)		1200		200μA	1μA	92%	●	●					●																		3-6	
	S-85V1A	High efficiency	Responsive		2.2 to 5.5V	Up to 200mA	Built-in	PWM/PFM	●	0.7 to 3.9V		1000		10μA	1μA	93%	●	●	●	●								●													3-6	
	S-85S1A	Ultra-high efficiency	Responsive		2.2 to 5.5V	Up to 200mA	Built-in	PWM/PFM	●	0.7 to 3.9V		1000		260nA	100nA	93%	●	●	●	●								●													3-7	
	S-85S1P	Ultra-high efficiency	Responsive	Supply voltage divided output	2.2 to 5.5V	Up to 200mA	Built-in	PWM/PFM	●	0.7 to 3.9V		1000		540nA	100nA	93%	●	●	●	●																					3-7	
	S-85S0A	Ultra-high efficiency	Responsive		2.2 to 5.5V	Up to 50mA	Built-in	PFM	●	0.7 to 3.9V		—		260nA	100nA	91%	●	●	●	●								●													3-8	
	S-85S0P	Ultra-high efficiency	Responsive	Supply voltage divided output	2.2 to 5.5V	Up to 50mA	Built-in	PFM	●	0.7 to 3.9V		—		540nA	100nA	91%	●	●	●	●																					3-8	
Step-up	S-8355	Low voltage operation			0.9 to 10V	Up to 1A	External	PWM		1.5 to 6.5V <sup>*7</sup>	100	250	300	600	25.9μA (3.3V, 100kHz)	0.5μA	93%					●																		3-9		
	S-8357	Low voltage operation			0.9 to 10V	Up to 1A	External	PWM		1.5 to 6.5V <sup>*7</sup>	100	250	300	600	25.9μA (3.3V, 100kHz)	0.5μA	93%					●	●	●																	3-9	
	S-8356	Low voltage operation	High efficiency		0.9 to 10V	Up to 1A	External	PWM/PFM		1.5 to 6.5V <sup>*7</sup>	100	250	300	600	25.9μA (3.3V, 100kHz)	0.5μA	93%					●																			3-9	
	S-8358	Low voltage operation	High efficiency		0.9 to 10V	Up to 1A	External	PWM/PFM		1.5 to 6.5V <sup>*7</sup>	100	250	300	600	25.9μA (3.3V, 100kHz)	0.5μA	93%					●	●	●																		3-9
	S-8352	Low voltage operation			0.9 to 10V	Up to 400mA	External	PFM		1.5 to 6.5V <sup>*7</sup>	100			17.8μA (3.3V)	0.5μA	87%							●	●	●																3-9	
	S-8353	Low voltage operation			0.9 to 10V	Up to 300mA	Built-in	PWM		1.5 to 6.5V <sup>*7</sup>	30	50	250		18.7μA (3.3V, 50kHz)	0.5μA	92%								●	●	●														3-10	
	S-8354	Low voltage operation	High efficiency		0.9 to 10V	Up to 300mA	Built-in	PWM/PFM		1.5 to 6.5V <sup>*7</sup>	30	50	250		18.7μA (3.3V, 50kHz)	0.5μA	92%										●	●	●												3-10	
	S-8351	Low voltage operation			0.9 to 10V	Up to 150mA	Built-in	PFM		1.5 to 6.5V <sup>*7</sup>	100			23.2μA (3.3V)	0.5μA	87%																									3-9	
	S-8333	Responsive	Maximum duty adjustable		1.8 to 6.0V	Up to 2A	External	PWM		Arbitrary (External setting)		280 to 1080 (By external resistor)		450μA	—	93%	●	●									●														3-10	
	S-8337	Responsive	Maximum duty adjustable		1.8 to 6.0V	Up to 2A	External	PWM		Arbitrary (External setting)		286 to 1133 (By external resistor)		400μA	—	93%	●	●										●														3-11
	S-8338	Responsive			1.8 to 6.0V	Up to 2A	External	PWM		Arbitrary (External setting)		286 to 1133 (By external resistor)		400μA	1μA	93%	●	●										●														3-11
	S-8365	Small			1.8 to 5.5V <sup>*8</sup>	Up to 1A	External	PWM		Arbitrary (External setting)		600	1200	300μA (3.3V, 600kHz)	1μA	93%	●	●									●														3-11	
	S-8366	High efficiency	Small		1.8 to 5.5V <sup>*8</sup>	Up to 1A	External	PWM/PFM		Arbitrary (External setting)		600	1200	300μA (3.3V, 600kHz)	1μA	93%	●	●										●													3-11	
	S-8363	Low voltage operation	High efficiency	Responsive	0.9 to 4.5V	Up to 600mA	Built-in	PWM/PFM		1.8 to 5.0V (External setting)		1200		450μA	3μA	93%	●	●									●														3-11	

\*1: These specifications are target values, and may differ depending on the external components and usage condition (input voltage, output voltage, output current). Be sure to perform evaluation using an actual device.

\*2: Ceramic capacitor for output capacitance \*3: Thermal shutdown function \*4: 2.2MHz product: 175μA \*5: 2.2MHz product: 91% \*6: 400kHz product: 2.5 to 12V \*7: V<sub>DD</sub>/V<sub>OUT</sub> non-separate type: 2.0 to 6.5V

\*8: Product without UVLO (under voltage lockout): 1.1 to 5.5V

Series name	Transistor	Input voltage	Output voltage	Output current	Oscillation frequency	Current consumption (typ.)	Standby current consumption (max.)	Efficiency	Package		Page
									SOT-23-6W	SNT-8A	
S-8821	Built-in	1.6 to 5.0V	2.5 to 5.5V (0.1V step)	25mA	1.0MHz	35µA	1µA	90%	●	●	3-12

## Composite ICs

Series name	Composition	Output voltage	Detection voltage	Accuracy	Current consumption	Package	Page
						8-Pin TSSOP	
S-8424A	2 voltage regulators+ 3 voltage detectors+ switch	2.3 to 5.4V (0.1V step)	2.4 to 5.3V (CS), 1.7 to 3.4V (PREEND, RESET) (0.1V step)	±2%	15µA max. (Operating), 2.1µA max. (Back up)	●	3-12

Standard : Standard product

Application	Added function	Series name	Method of discharge overcurrent detection	Method of charge overcurrent detection	Accuracy of discharge overcurrent detection voltage 1	Accuracy of discharge overcurrent detection voltage 2	Accuracy of load short-circuiting detection voltage	Accuracy of charge overcurrent detection voltage	Setting range of overcurrent detection voltage	Accuracy of overcharge detection voltage	Accuracy of overdischarge detection voltage	Current consumption				Package					Page		
												During normal operation	During overdischarge (max.)	During power-down (max.)	During power-saving (max.)	SOT-23-6	SNT-6A	HSNT-6(L1212)	DFN-6(L1414)	DFN-8(L1616)		HSNT-8(L1616)	
Small battery	—	Standard S-8240A	FET ON-resistance	FET ON-resistance	±5mV	—	±40mV	±5mV	15mV to	±20mV	±50mV	1.5µA typ., 3.0µA max.	0.5µA	50nA	—	●	●	●				4-3	
	—	S-8240B	FET ON-resistance	FET ON-resistance	±3mV	—	±40mV	±3mV	15mV to	±20mV	±50mV	1.5µA typ., 3.0µA max.	0.5µA	50nA	—		●	●				4-3	
	Charge-discharge control function	S-82B1A	FET ON-resistance	FET ON-resistance	±3mV	±5mV	±20mV	±3mV	10mV to	±20mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—		●					4-4	
	Power-saving function	S-82B1B	FET ON-resistance	FET ON-resistance	±3mV	±5mV	±20mV	±3mV	10mV to	±20mV	±50mV	2.0µA typ., 4.0µA max.	—	50nA	50nA		●						4-4
Large discharge current	—	Standard S-82A1A	Resistance for current detection	Resistance for current detection	±3mV	±5mV	±20mV	±3mV	10mV to	±20mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—		●		●			4-5	
	—	S-82C1F	Resistance for current detection	Resistance for current detection	±3mV	±5mV	±20mV	±3mV	10mV to	±20mV	±50mV	2.0µA typ., 4.0µA max.	1.0µA	50nA	—		●		●			4-5	
	Charge-discharge control function	S-82C1E	Resistance for current detection	Resistance for current detection	±3mV	±5mV	±20mV	±3mV	10mV to	±20mV	±50mV	2.0µA typ., 4.0µA max.	1.0µA	50nA	—				●			4-6	
	—	S-82F1B	Resistance for current detection	Resistance for current detection	±1.5mV	±3mV	±5mV	±1.5mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—		●						4-6
Rapid charge	Charge-discharge control function	S-82F1A	Resistance for current detection	Resistance for current detection	±1.5mV	±3mV	±5mV	±1.5mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—						●	4-7	
	—	S-82H1B	Resistance for current detection	Resistance for current detection	±1.5mV	±3mV	±5mV	±1.5mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—		●					4-7	
	Charge-discharge control function	S-82H1A	Resistance for current detection	Resistance for current detection	±1.5mV	±3mV	±5mV	±1.5mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—				●			4-8	
	—	S-82K1B	Resistance for current detection	Resistance for current detection	±1.0mV	±3mV	±5mV	±1.0mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—		●					4-8	
	Charge-discharge control function	S-82K1A	Resistance for current detection	Resistance for current detection	±1.0mV	±3mV	±5mV	±1.0mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—				●			4-9	
	Charge-discharge current path separation	S-82G1B	Resistance for current detection	FET ON-resistance	±1.5mV	±3mV	±5mV	±3mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—						●	4-9	
	Charge-discharge control function	S-82G1A	Resistance for current detection	FET ON-resistance	±1.5mV	±3mV	±5mV	±3mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—							●	4-10
	Charge-discharge current path separation																						
	High-accuracy discharge overcurrent detection of secondary protection circuit	Load monitoring pin	S-82F1C	Resistance for current detection	Resistance for current detection	±1.5mV	±3mV	±5mV	±1.5mV	3mV to	±15mV	±50mV	2.0µA typ., 4.0µA max.	0.5µA	50nA	—						●	4-10
		Charge-discharge control function	S-82D1A	Resistance for current detection	Resistance for current detection	±1.5mV	±3mV	±5mV	±1.5mV	3mV to	±15mV	±50mV	2.5µA typ., 5.0µA max.	0.5µA	100nA	—						●	
High/Low temperature protection function																							
High safety	—	S-8206A	—	—	—	—	—	—	—	±20mV	—	1.5µA typ., 3.0µA max.	—	—	—		●	●				4-11	
	—	S-8216A	Resistance for current detection	—	±1.5mV	—	—	—	3mV to	±15mV	—	2.0µA typ., 4.0µA max.	—	—	—		●						4-12



●: Recommended product

●: Recommended product

Category	Series name	Specific function			Number of cells						Accuracy				Current consumption during operation (typ.)	Current consumption during operation (max.)	Charge/Discharge control FET	Remark	Package								Page											
					1	2	3	4	5	6 or more (Use cascade function)	Overcharge	Overdischarge	Overcurrent						SOT-23-6	SNT-6A	HSNT-6(L12)	SNT-8A	8-Pin TSSOP	TMSOP-8	16-Pin TSSOP	20-Pin TSSOP		24-Pin SSOP										
					Discharge		Charge																															
Battery protection	S-8252							±20mV	±50mV	±10mV	±20mV	4.0µA	8.0µA	Nch		●	●																				4-16	
	S-8262A	Overcharge alarm output							±20mV	±50mV	±10mV	±20mV	4.0µA	8.0µA	Nch			●																		4-16		
	S-8253C/D							±25mV	±80mV	±25mV	—	14µA	28µA	Pch	C series: 2 cells, D series: 3 cells																					4-17		
	S-8203A							±25mV	±80mV	±15mV	±30mV	20µA	40µA	Nch																						4-17		
	S-8254A							±25mV	±80mV	±25mV	—	12µA	30µA	Pch																						4-18		
	S-8204A							±25mV	±80mV	±15mV	±30mV	15µA	33µA	Pch																						4-18		
	S-8204B							±25mV	±80mV	±15mV	—	15µA	33µA	Nch																						4-19		
	S-8205A/B							±25mV	±80mV	±15mV	±30mV	20µA	40µA	Nch	A series: 4 cells, B series: 5 cells																					4-19		
	S-8245A/C	Thermal protection	Power-saving	Output voltage limit					±20mV	±80mV	±10mV	±10mV	10µA	20µA	Nch	C series: separate charge and discharge paths																					4-20	
S-8245B/D	Thermal protection	Power-saving	Output voltage limit					±20mV	±80mV	±10mV	±10mV	10µA	20µA	Nch	D series: separate charge and discharge paths																						4-20	
Secondary protection	S-8206A							±20mV	—	—	—	1.5µA	3.0µA	—		●	●																		4-11			
	S-8223A/B/C/D	Output voltage limit (B/D series)							±20mV	—	—	—	0.25µA	0.5µA	—		●																			4-21		
	S-8244							±25mV	—	—	—	1.5µA	3.0µA	—																						4-21		
	S-8264A/B/C							±25mV	—	—	—	2.5µA	5.0µA	—	A series: CTL pin is pulled down internally B series: Output latch function C series: CTL pin is pulled up internally																						4-22	
	S-8224A/B	Output voltage limit (B series)							±20mV	—	—	—	0.25µA	0.6µA	—																						4-22	
	S-8215A							±25mV	—	—	—	1.6µA	3.0µA	—																							4-23	
	S-8215C							±20mV	—	—	—	0.3µA	0.7µA	—																							4-23	
	S-8265C	Cell balancing							±20mV	—	—	—	0.3µA	0.7µA	—																						4-24	
Voltage monitoring	S-8259A							±20mV	±50mV	—	—	1.5µA	3.0µA	—		●																				4-24		
	S-8209A	Cell balancing							±25mV	±50mV	—	—	3.5µA	7.0µA	—																						4-25	
	S-8209B	Cell balancing							±25mV	±50mV	—	—	3.5µA	7.0µA	—																						4-26	
	S-8249	Power-saving	Cell balancing						±0.5%	—	—	—	1.2µA	2.0µA	—		●																				4-26	
	S-8225A	Output voltage limit							±20mV	±80mV	—	—	13µA	22µA	—																						4-27	
	S-8225B	Output voltage limit							±20mV	±80mV	—	—	12µA	20µA	—																						4-27	
	S-8255A	Thermal protection	Power-saving	Output voltage limit					±20mV	±80mV	—	—	10µA	19µA	—																						4-28	
	S-8255B	Thermal protection	Power-saving	Output voltage limit					±20mV	±80mV	—	—	10µA	19µA	—																						4-28	
Overcurrent monitoring	S-8239A							—	—	±15mV	—	3.5µA	7.0µA	—		●																				4-29		
	S-8239B							—	—	±15mV	—	3.5µA	7.0µA	—	With power-down function				●																		4-29	
	S-8269B							—	—	±1.5mV	±1.5mV	2.0µA	4.0µA	—			●																				4-30	
Simple battery level indication	S-8229A							3 voltage level detection: ±1.0%				4.0µA <sup>*1</sup> 5.0µA <sup>*2</sup>	9.0µA <sup>*1</sup> 11µA <sup>*2</sup>	—	*1: -VDETtotal ≥ 42V *2: -VDETtotal < 42V				●	●																		4-30

Interface	Features	Memory capacity (bit)	Series name	Operating voltage range		Operating frequency	Write time	Endurance	Data retention	Malfunction prevention function					Package						Page	
				READ	WRITE					LVDET <sup>*1</sup>	CPM <sup>*2</sup>	Schmitt input	HW protection <sup>*3</sup>	SW protection <sup>*4</sup>	8-Pin SOP	8-Pin TSSOP	TMSOP-8	SOT-23-5	SNT-8A	WLP		DFN-8(2030)
3-wire	Wide use, High reliability	1K	S-93C46C	1.6 to 5.5V	1.8 to 5.5V	2MHz max.	4ms max.	1 million cycles	100 years	●	●				●	●	●		●			5-11
		2K	S-93C56C	1.6 to 5.5V	1.8 to 5.5V	2MHz max.	4ms max.	1 million cycles	100 years	●	●				●	●	●		●			5-11
		4K	S-93C66C	1.6 to 5.5V	1.8 to 5.5V	2MHz max.	4ms max.	1 million cycles	100 years	●	●				●	●	●		●			5-11
		8K	S-93C76C	1.6 to 5.5V	1.8 to 5.5V	2MHz max.	4ms max.	1 million cycles	100 years	●	●				●	●	●		●			5-11
		16K	S-93C86C	1.6 to 5.5V	1.8 to 5.5V	2MHz max.	4ms max.	1 million cycles	100 years	●	●				●	●	●		●			5-11
2-wire (I <sup>2</sup> C-bus)	Wide use, High reliability	2K	S-24C02D	1.7 to 5.5V	1.7 to 5.5V	1MHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●	●	●	●		●	5-3
		4K	S-24C04D	1.7 to 5.5V	1.7 to 5.5V	1MHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●	●	●	●		●	5-3
		8K	S-24C08D	1.7 to 5.5V	1.7 to 5.5V	1MHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●	●	●	●		●	5-3
		16K	S-24C16D	1.7 to 5.5V	1.7 to 5.5V	1MHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●	●	●	●		●	5-3
		8K	S-24C08C	1.6 to 5.5V	1.7 to 5.5V	400kHz max.	5ms max.	1 million cycles	100 years	●		●	●							●		5-4
		16K	S-24C16C	1.6 to 5.5V	1.7 to 5.5V	400kHz max.	5ms max.	1 million cycles	100 years	●		●	●							●		5-4
		32K	S-24C32C	1.6 to 5.5V	1.7 to 5.5V	400kHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●	●		●			5-4
		64K	S-24C64C	1.6 to 5.5V	1.7 to 5.5V	400kHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●	●					5-4
		128K	S-24C128C	1.6 to 5.5V	1.7 to 5.5V	400kHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●						5-5
		256K	S-24C256C	1.6 to 5.5V	1.7 to 5.5V	1MHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●						5-5
	512K	S-24C512C	1.6 to 5.5V	1.7 to 5.5V	1MHz max.	5ms max.	1 million cycles	100 years	●		●	●		●	●						5-6	
	1M	S-24CM01C	1.6 to 5.5V	1.7 to 5.5V	1MHz max.	5ms max.	1 million cycles	100 years	●		●	●		●							5-6	
	For DIMM	2K	S-34C02B	1.7 to 5.5V	1.7 to 5.5V	400kHz max.	5ms max.	1 million cycles	100 years	●		●	●	●							●	5-11
	For DIMM, SSD	4K	S-34TS04A	2.2 to 3.6V	2.2 to 3.6V	1MHz max.	5ms max.	1 million cycles	100 years	●		●			●							●
For SSD	4K	S-34C04A	1.7 to 3.6V	1.7 to 3.6V	1MHz max.	5ms max.	1 million cycles	100 years	●		●			●							●	5-12
For SSD	4K	S-34TS04L	1.7 to 3.6V	1.7 to 3.6V	1MHz max.	5ms max.	1 million cycles	100 years	●		●			●							●	5-13
SPI-bus	Wide use, High reliability	1K	S-25C010A	1.6 to 5.5V	1.7 to 5.5V	5MHz max.	4ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●	●	●			5-7
		2K	S-25C020A	1.6 to 5.5V	1.7 to 5.5V	5MHz max.	4ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●	●	●			5-7
		4K	S-25C040A	1.6 to 5.5V	1.7 to 5.5V	5MHz max.	4ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●	●	●			5-7
		8K	S-25C080A	1.6 to 5.5V	1.7 to 5.5V	5MHz max.	4ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●	●	●			5-7
		16K	S-25C160A	1.6 to 5.5V	1.7 to 5.5V	5MHz max.	5ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●	●		●		5-8
		32K	S-25C320A	1.6 to 5.5V	1.7 to 5.5V	5MHz max.	5ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●	●		●		5-8
		64K	S-25C640A	1.6 to 5.5V	1.7 to 5.5V	5MHz max.	5ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●					5-8
		128K	S-25C128A	1.6 to 5.5V	1.7 to 5.5V	5MHz max.	5ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●					5-9
		256K	S-25C256A	1.6 to 5.5V	1.7 to 5.5V	10MHz max.	5ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●					5-9
		512K	S-25C512A	1.6 to 5.5V	1.7 to 5.5V	10MHz max.	5ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●					5-10
1M	S-25CM01A	1.6 to 5.5V	1.7 to 5.5V	10MHz max.	5ms max.	1 million cycles	100 years	●	●	●	●	●	●	●	●					5-10		

\*1. LVDET: Write protect function during the low power supply voltage \*2. CPM: Function to protect against write due to erroneous instruction recognition \*3. HW protection: Write protect pin \*4. SW protection: Software protect function

Series name	Light receiving area (one photodiode)	Output pin voltage <sup>*1</sup>	Sensitivity wavelength range	Sensitivity (high-sensitivity ultraviolet light PD)	Differential sensitivity ( $S_H - S_L$ )	Dark current	Package	Page
							SON-6C	
S-5420	0.20mm <sup>2</sup>	0 to 0.5V	250 to 1000nm ( $\lambda_p^{*2} = 420\text{nm}$ )	$\lambda = 365\text{nm}$ : 0.170A/W	$\lambda = 365\text{nm}$ : 0.150A/W $\lambda = 520\text{nm}$ : 0.020A/W	5pA	●	6-3

\*1: Voltage applied to the output pin \*2:  $\lambda_p$ : Peak sensitivity wavelength

Type	Series name	Operating temperature range (°C) Detection temperature range(°C)	Temperature accuracy	Operating voltage range	Current consumption (Ta=25°C)	Package						Page	
						WLP-4B	HSNT-4(1010)	SNT-4A	SNT-6A	HSNT-8(2030)	SC-82AB		SOT-23-5
Digital	S-5852A <sup>*1</sup>	-40 — +125 -40 — +125	$\pm 1.0^{\circ}\text{C}$ (0 to +65°C) / $\pm 1.0^{\circ}\text{C}$ (+75 to +95°C) <sup>*2</sup> $\pm 3.0^{\circ}\text{C}$ (-40 to +125°C)	1.7 to 3.6V	40μA								6-4
Digital	S-5851A	-40 — +125 -40 — +125	$\pm 2.0^{\circ}\text{C}$ (-25 to +85°C) $\pm 3.0^{\circ}\text{C}$ (-40 to +125°C)	2.7 to 5.5V	45μA								6-4
Analog	S-58LM20A	-55 — +130 -55 — +130	$\pm 2.5^{\circ}\text{C}$	2.4 to 5.5V	4.5μA								6-4
Analog	S-8110C/8120C	-40 — +100 -30 — +100	$\pm 5.0^{\circ}\text{C}$ (S-8110C) $\pm 2.5^{\circ}\text{C}$ (S-8120C)	2.4 to 10V	4.5μA								6-5
Analog	S-5813A/5814A	-40 — +100 -30 — +100	$\pm 5.0^{\circ}\text{C}$ (S-5813A) $\pm 2.5^{\circ}\text{C}$ (S-5814A)	2.4 to 10V	4.0μA								6-5
Switch	S-5844A <sup>*1</sup>	-40 — +125 +50 — +100	$\pm 2.5^{\circ}\text{C}$	1.65 to 5.5V	0.18μA								6-5
Switch	S-5841 <sup>*1</sup>	-40 — +125 +40 — +100	$\pm 2.5^{\circ}\text{C}$	2.2 to 10V	10μA								6-5

\*1: Refer to the corresponding product datasheet for detailed information on available options, output forms, detection temperatures, hysteresis temperatures, and others. \*2: High-accuracy temperature range can be selected as an option.

Ope. type	Example application	Series name	Pole detection	Power supply voltage range					Output delay time (typ.)		Chopping frequency (typ.)		Current consumption (typ.)					Magnetic sensitivity (Ta=+25°C)					Operation temperature range	Output form	Output logic	Package			Page									
				1.5V	2.5V	3.5V	4.5V	5.5V~26V	8µs	16µs	250kHz	500kHz	1mA	2mA	3mA	4mA	5mA	0mT	0.5mT	1.8mT	2.2mT	3.0mT				6.0mT	10mT	15mT		HSNT-8(2023)	TSOT-23-3S	TO-92S						
Switch type	Open/close detection	S-575D B	Omnipolar	2.7 to 26V <sup>1</sup>					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-9
	Slide detection	S-575S B	S pole	2.7 to 26V <sup>1</sup>					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-9	
	Level detection	S-575N B	N pole	2.7 to 26V <sup>1</sup>					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-9	
	Position detection	S-5732 B	S pole, N pole	3.5 to 26V					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-9	
Latch type		S-576Z B	ZCL	2.7 to 26V <sup>1</sup>					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-10	
	Motor control	S-576Z R	ZCL	2.7 to 26V <sup>1</sup>					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-10	
	Rotation speed detection	S-576B B	Bipolar	2.7 to 26V <sup>1</sup>					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-11	
		S-5742 B	Bipolar	3.5 to 26V					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-11	

Magnetic Sensor ICs Compact, low current consumption

Ope. type	Example application	Series name	Pole detection	Power supply voltage range					Operating cycle (typ.)					Current consumption (typ.)					Magnetic sensitivity (Ta=+25°C)					Operation temperature range	Power-down function (Only SNT-4A)	Output form	Output logic	Package		Page							
				1.5V	2.5V	3.5V	4.5V	5.5V~26V	0.1ms	1ms	10ms	100ms	1000ms	1µA	10µA	100µA	1000µA	0.8mT	1.8mT	3.0mT	3.4mT	4.5mT	7.0mT					SNT-4A	SOT-23-3								
Switch type		S-5718	Omnipolar	1.45 to 3.6V					● 5.70ms	● 50.50ms	● 102.1ms	● 12.0µA	● 2.0µA	● 1.4µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-6
			S pole, N pole	1.45 to 3.6V					● 5.70ms	● 50.50ms	● 102.1ms	● 12.0µA	● 2.0µA	● 1.4µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-6	
			Omnipolar	1.6 to 3.5V					● 5.70ms	● 50.50ms	● 204.01ms	● 12.0µA	● 2.0µA	● 1.0µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-6	
			S pole, N pole	1.6 to 3.5V					● 6.05ms	● 50.85ms	● 204.05ms	● 6.0µA	● 1.4µA	● 1.0µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-6	
	Open/close detection	S-5712 A/B/C	Omnipolar	1.6 to 3.5V					● 0.10ms	● 0.05ms	● 0.10ms	● 640µA	● 1400µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-7	
	Press detection		S pole, N pole	1.6 to 3.5V					● 0.90ms	● 5.70ms	● 0.05ms	● 155µA	● 26µA	● 1400µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-7		
	Slide detection	S-5712E	Omnipolar	2.7 to 5.5V					● 0.10ms	● 0.90ms	● 5.70ms	● 1400µA	● 155µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-7	
	Level detection		S pole, N pole	2.7 to 5.5V					● 0.05ms	● 1.25ms	● 6.05ms	● 1400µA	● 60µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-7		
	Position detection	S-5715	Omnipolar	2.7 to 5.5V					● 0.10ms	● 0.90ms	● 5.70ms	● 1400µA	● 155µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-7	
	Type detection		S pole, N pole	2.7 to 5.5V					● 0.05ms	● 1.25ms	● 6.05ms	● 1400µA	● 60µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-7		
Latch type	Motor control	S-5724	Bipolar	1.6 to 3.5V					● 0.05ms	● 1.25ms	● 6.05ms	● 640µA	● 26µA	● 6.0µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-8	
			Bipolar	2.7 to 5.5V					● 0.05ms	● 1.25ms	● 6.05ms	● 1400µA	● 60µA	● 13.0µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-8			
		S-57M1	Bipolar	2.7 to 5.5V					● 0.05ms	● 1.25ms	● 6.05ms	● 1400µA	● 60µA	● 13.0µA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	6-8	

\*1: When output form is Nch driver + built-in pull-up resistor (1.2kΩ typ.): 2.7 to 5.5V

\*2: Release point (S pole) (the magnetic flux density value when the magnetic flux density applied to the IC is increased and the output voltage hold state is released) can be selected from 3.0mT or 6.0mT. \*3: Under development

Series name	Number of circuits	Input Rail-to-Rail	Operating voltage range	Current consumption (typ.) (per circuit)	Input offset voltage (max.) (Ta=+25°C)	Gain-bandwidth product	Slew rate	Operation temperature range	Package				Page
									SC-88A	SOT-23-5	TMSOP-8	SNT-8A	
S-89430A	1	✓	0.9 to 5.5V	0.5µA	10.0mV	4.8kHz	5.0V/ms	-40 to +85°C	●	●			7-3
S-89430B	2	✓	0.9 to 5.5V	0.5µA	10.0mV	4.8kHz	5.0V/ms	-40 to +85°C			●	●	7-3
S-89431A	1	✓	0.9 to 5.5V	0.5µA	5.0mV	4.8kHz	5.0V/ms	-40 to +85°C	●	●			7-3
S-89431B	2	✓	0.9 to 5.5V	0.5µA	5.0mV	4.8kHz	5.0V/ms	-40 to +85°C			●	●	7-3
S-89110A	1	—	1.8 to 5.5V	50µA	4.0mV	175kHz	0.07V/µs	-40 to +85°C	●	●			7-3
S-89110B	2	—	1.8 to 5.5V	50µA	4.0mV	175kHz	0.07V/µs	-40 to +85°C			●	●	7-3
S-89120A	1	—	1.8 to 5.5V	10µA	4.0mV	35kHz	0.015V/µs	-40 to +85°C	●	●			7-3
S-89120B	2	—	1.8 to 5.5V	10µA	4.0mV	35kHz	0.015V/µs	-40 to +85°C			●	●	7-3
S-89130B	2	—	2.7 to 5.5V	1mA	6.0mV	3.0MHz	2.0V/µs	-40 to +125°C			●	●	7-3
S-89140B	2	—	2.7 to 5.5V	0.27mA	7.0mV	1.0MHz	0.5V/µs	-40 to +125°C			●	●	7-3
S-89713B	2	✓	2.65 to 5.5V	165µA	10µV	240kHz	0.16V/µs	-40 to +85°C			●	●	7-3
S-89630A	2	✓	4.0 to 36.0V	250µA	50µV <sup>-1</sup>	1.2MHz	0.45V/µs	-40~+125°C			●		7-4

\*1: Ta=-40 to +125°C

## Comparators

Series name	Number of circuits	Input Rail-to-Rail	Operating voltage range	Current consumption (typ.) (per circuit)	Input offset voltage (max.) (Ta=+25°C)	Rise propagation delay time	Fall propagation delay time	Rise response time	Fall response time	Operation temperature range	Package			Page
											SC-88A	TMSOP-8	SNT-8A	
S-89530A	1	✓	0.9 to 5.5V	0.7µA	10.0mV	110µs	280µs	10µs	30µs	-40 to +85°C	●			7-4
S-89531A	1	✓	0.9 to 5.5V	0.7µA	5.0mV	110µs	280µs	10µs	30µs	-40 to +85°C	●			7-4
S-89210A	1	—	1.8 to 5.5V	50µA	4.0mV	30µs	6µs	2µs	2µs	-40 to +85°C	●			7-4
S-89220A	1	—	1.8 to 5.5V	10µA	4.0mV	150µs	30µs	10µs	10µs	-40 to +85°C	●			7-4
S-89230B	2	—	1.8 to 5.5V	23µA	4.0mV	26µs	4µs	2µs	2µs	-40 to +85°C		●	●	7-4
S-89240B	2	—	1.8 to 5.5V	5µA	4.0mV	100µs	18µs	10µs	10µs	-40 to +85°C		●	●	7-4

Series name	Communication method	Operating voltage range	Operating voltage at time keeping	Current consumption (V <sub>DD</sub> =3.0V, T <sub>a</sub> =25°C)	Oscillation frequency deviation between ICs	Oscillation frequency voltage deviation	Features	Package				Page
								SNT-8A	8-Pin SOP	8-Pin TSSOP	16-Pin TSSOP	
S-35190A	3-wire	1.3 to 5.5V	1.1 to 5.5V	0.25μA	±10ppm	±3ppm	Super-small package	●	●	●		7-5
S-35390A	2-wire	1.3 to 5.5V	1.1 to 5.5V	0.25μA	±10ppm	±3ppm	Super-small package	●	●	●		7-5
S-35391A	2-wire	1.3 to 5.5V	1.1 to 5.5V	0.25μA	±10ppm	±3ppm	Super-small package	●	●			7-5
S-35192A	3-wire	1.3 to 5.5V	1.1 to 5.5V	0.45μA	±10ppm	±3ppm	Constant 32kHz output Super-small package	●				7-5
S-78190A	3-wire	1.3 to 5.5V	1.1 to 5.5V	0.35μA	±10ppm	±3ppm	Wakeup signal Expansion alarm				●	7-6
S-35392A	2-wire	1.3 to 5.5V	1.1 to 5.5V	0.45μA	±10ppm	±3ppm	Constant 32kHz output Super-small package	●				7-6
S-35399A03	2-wire	1.3 to 5.5V	1.1 to 5.5V	0.34μA	±10ppm	±3ppm	Expansion alarm 24-bit up-counter		●			7-6

Series name	Product overview	Current consumption	Time setting	Operation voltage range	Operation temperature range	Package		Page
						TMSOP-8	HSOP-8Q	
S-35710M	Programmable wake-up timer IC with built-in quartz crystal	0.25μA	Software setting	1.8 to 5.5V	-40 to +85°C		●	7-7
S-35710	Programmable wake-up timer IC	0.2μA	Software setting	1.8 to 5.5V	-40 to +85°C	●		7-7
S-35720	Pin-selectable wake-up timer IC	0.2μA	Hardware setting	1.8 to 5.5V	-40 to +85°C	●		7-7

## Interval Timer ICs

Series name	Product overview	Current consumption	Time setting	Operation voltage range	Operation temperature range	Package		Page
						TMSOP-8		
S-35730	Pin-selectable interval timer IC	0.2μA	Hardware setting	1.8 to 5.5V	-40 to +85°C	●		7-8
S-35740	Programmable interval timer IC	0.2μA	Software setting	1.8 to 5.5V	-40 to +85°C	●		7-8

## Counter ICs

Series name	Product overview	Current consumption	Operation voltage range	Operation temperature range	Package		Page
					TMSOP-8		
S-35770	Counter IC with 2-wire (I <sup>2</sup> C-bus) interface	10nA	1.5 to 5.5V	-40 to +85°C	●		7-8



Series name	Enable output	Disable trigger input pin	Operation temperature range	Package		Page
				8-Pin TSSOP	SNT-8A	
S-77100	4 channels	No	−40 to +85°C	●	●	7-8
S-77101	3 channels	Yes	−40 to +85°C	●	●	7-8

## Wireless Power ICs

Series name	Purpose	Features	Operation voltage <sup>1</sup>	Current consumption during operation <sup>1</sup>	Package		Page
					SNT-6A	SNT-8A	
S-8471	Reception control	Constant voltage output	0.95 to 6.5V	30μA typ.	●		7-9
S-8473	Reception control	With charge function to a lithium-ion rechargeable battery (Charge current: 33mA)	2.2 to 5.0V	250μA typ.		●	7-9
S-8474	Transmission control	Continuous operation / Intermittent operation switch function	4.5 to 6.5V	200μA typ.		●	7-9

\*1: Single IC values

Product Category	Series name	Features	Operation temperature (max.)	Junction temperature (max.)	Absolute maximum rating	Input voltage range	Output current	Output voltage range	Detection voltage range	Accuracy (Entire temperature range)	Current consumption		Package												Page																			
											Typ.	Max. (Entire temperature range)	HSNT-4(808)B	HSNT-4(1010)B	SNT-4A	HSNT-6(2025)	HSNT-8(2030)	SOT-89-5	SC-82AB	SOT-23-5	SOT-23-6	TMSOP-8	HTMSOP-8	HSOP-6		HSOP-6A	TO-252-5S(A)	TO-252-9S	16-Pin TSSOP	HTSSOP-16														
Voltage detectors (Reset ICs)	S-19110 A	High-withstand voltage Hysteresis width is selectable SENSE / VDD detection is selectable Delay function	125°C	125°C	45V	1.8 to 36.0V (VDD product), 3.0 to 36.0V (SENSE product)	—	—	3.6 to 10.0V (VDD product), 3.0 to 10.0V (SENSE product)	$\pm 2.0\%$ ( $5.0V \leq -V_{DET} \leq 10.0V$ )	0.6µA	1.6µA																8-15																
	105°C																																								8-16			
	S-19100/1 A	Delay function	125°C	125°C	12V	0.6 to 10.0V (CMOS), 0.8 to 10.0V (Nch O. D.)	—	—	1.2 to 4.6V	$\pm 3.0\%$ ( $2.4V \leq -V_{DET} \leq 4.6V$ )	0.27µA	1.8µA																				8-17												
	105°C																																										8-17	
	S-19102/3/8/9	SENSE detection	105°C	125°C	12V	0.95 to 10.0V	—	—	1.0 to 5.0V	$\pm 3.5\%$ ( $2.2V \leq -V_{DET} \leq 5.0V$ )	0.5µA	0.9µA																								8-18								
	S-19104/5/6/7	SENSE detection, Delay function																																										
Voltage regulators (LDO)	S-1142 A	High-withstand voltage	125°C	135°C	60V	3.0 to 50.0V	200mA	2.0 to 12.0V	—	$\pm 4.0\%$	4.0µA	15.0µA																								8-3								
	S-1142 H		105°C	125°C				2.0 to 15.0V		$\pm 3.0\%$		9.0µA																																8-3, 8-4
	S-19200 A	High-withstand voltage	125°C	135°C	60V	3.0 to 50.0V	200mA	2.0 to 15.0V	—	$\pm 4.0\%$	4.0µA	15.0µA																											8-4					
	S-19200 H		105°C	125°C				2.0 to 15.0V		$\pm 3.0\%$		9.0µA																																8-5
	S-19212 A	High-withstand voltage	125°C	150°C	45V	3.0 to 36.0V	250mA	2.5 to 16.0V	—	$\pm 2.0\%$	6.5µA	8.5µA																													8-5			
	S-19212 H		105°C					2.5 to 16.0V		$\pm 2.0\%$		8.5µA																																8-6
	S-19213	High-withstand voltage, Low current consumption, ON/OFF circuit Output voltage externally set product is selectable	125°C	150°C	45V	2.8 to 36.0V	500mA	1.8, 3.0, 3.3, 5.0, 8.0, 12.0V (internally set), 1.8 to 30.0V (externally set)	—	$\pm 1.5\%$	5.0µA	9.8µA																														8-6		
	S-19214						1000mA																																					
	S-19243 A	Secondary, Soft-start function Output voltage externally set product is selectable	125°C	150°C	12V	2.5 to 10.0V	500mA	1.0 to 6.0V (internally set), 1.0 to 9.0V (externally set)	—	$\pm 2.3\%$	120µA	150µA																														8-7		
	S-19243 H		105°C																																									
	S-19244 A	Secondary, Soft-start function Output voltage externally set product is selectable	125°C	150°C	12V	2.5 to 10.0V	1000mA	1.0 to 6.0V (internally set), 1.0 to 9.0V (externally set)	—	$\pm 2.3\%$	120µA	150µA																															8-8	
	S-19244 H		105°C																																									
	S-19246 H	High output current Secondary, Soft-start function	105°C	150°C	12V	2.5 to 10.0V	2000mA	1.0 to 6.0V	—	$\pm 2.3\%$	120µA	150µA																														8-9		
	S-19253 H	Secondary, Soft-start function	105°C	150°C	7V	2.5 to 6.5V	500mA	1.0 to 5.5V	—	$\pm 3.0\%$	120µA	150µA																																8-10
	S-19254 H						1000mA																																					
	S-19251	0.8mm ultra-small package, Secondary	105°C	125°C	6V	1.5 to 5.5V	150mA	1.0 to 3.5V	—	$\pm 2.5\%$	20µA	50µA																															8-11	
S-19252	Secondary, Soft-start function																																											



Interface	Memory capacity (bit)	Series name	Operating temperature range	Operating voltage range	Operating frequency	Write time	Endurance (85°C)	Data retention	Malfunction prevention function				Package				Page
									LVDET <sup>1</sup>	CPM <sup>2</sup>	Schmitt input	Write protect function	8-Pin SOP	8-Pin TSSOP	TMSOP-8	HSNT-8(2030)	
3-wire	1K	S-93C46C H	-40 to 105°C	1.6 to 5.5V <sup>3</sup>	2MHz max.	4ms max.	1 million cycles	50 years	●	●			●	●	●	●	9-4
	2K	S-93C56C H	-40 to 105°C	1.6 to 5.5V <sup>3</sup>	2MHz max.	4ms max.	1 million cycles	50 years	●	●			●	●	●	●	9-4
	4K	S-93C66C H	-40 to 105°C	1.6 to 5.5V <sup>3</sup>	2MHz max.	4ms max.	1 million cycles	50 years	●	●			●	●	●	●	9-4
	8K	S-93C76C H	-40 to 105°C	1.6 to 5.5V <sup>3</sup>	2MHz max.	4ms max.	1 million cycles	50 years	●	●			●	●	●	●	9-4
	16K	S-93C86C H	-40 to 105°C	1.6 to 5.5V <sup>3</sup>	2MHz max.	4ms max.	1 million cycles	50 years	●	●			●	●	●	●	9-4
	1K	S-93A46B	-40 to 125°C	2.5 to 5.5V	2MHz max.	4ms max.	1 million cycles	50 years	●	●	●		●	●	●	●	9-3
	2K	S-93A56B	-40 to 125°C	2.5 to 5.5V	2MHz max.	4ms max.	1 million cycles	50 years	●	●	●		●	●	●	●	9-3
	4K	S-93A66B	-40 to 125°C	2.5 to 5.5V	2MHz max.	4ms max.	1 million cycles	50 years	●	●	●		●	●	●	●	9-3
	8K	S-93A76B	-40 to 125°C	2.5 to 5.5V	2MHz max.	4ms max.	1 million cycles	50 years	●	●	●		●	●	●	●	9-3
	16K	S-93A86B	-40 to 125°C	2.5 to 5.5V	2MHz max.	4ms max.	1 million cycles	50 years	●	●	●		●	●	●	●	9-3
	1K	S-93S46A	-40 to 150°C	4.0 to 5.5V	1MHz max.	10ms max.	1 million cycles	20 years	●	●	●		●				9-3
2K	S-93S56A	-40 to 150°C	4.0 to 5.5V	1MHz max.	10ms max.	1 million cycles	20 years	●	●	●		●				9-3	
4K	S-93S66A	-40 to 150°C	4.0 to 5.5V	1MHz max.	10ms max.	1 million cycles	20 years	●	●	●		●				9-3	
2-wire (I <sup>2</sup> C-bus)	1K	S-24CS01A	-40 to 105°C	2.55 to 5.5V	350kHz max.	10ms max.	1 million cycles	20 years	●		●	●	●	●	●		9-9
	2K	S-24CS02A	-40 to 105°C	2.55 to 5.5V	350kHz max.	10ms max.	1 million cycles	20 years	●		●	●	●	●	●		9-9
	4K	S-24CS04A	-40 to 105°C	2.55 to 5.5V	350kHz max.	10ms max.	1 million cycles	20 years	●		●	●	●	●	●		9-9
	8K	S-24C08C H	-40 to 105°C	2.5 to 5.5V	400kHz max.	5ms max.	300,000 cycles	25 years	●		●	●	●	●	●		9-10
	16K	S-24C16C H	-40 to 105°C	2.5 to 5.5V	400kHz max.	5ms max.	300,000 cycles	25 years	●		●	●	●	●	●		9-10
	32K	S-24C32C H	-40 to 105°C	2.5 to 5.5V	400kHz max.	5ms max.	300,000 cycles	25 years	●		●	●	●	●	●		9-11
	64K	S-24C64C H	-40 to 105°C	2.5 to 5.5V	400kHz max.	5ms max.	300,000 cycles	25 years	●		●	●	●	●	●		9-11
	128K	S-24C128C H	-40 to 105°C	2.5 to 5.5V	400kHz max.	5ms max.	300,000 cycles	25 years	●		●	●	●	●	●		9-11
SPI-bus	1K	S-25C010A H	-40 to 105°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-7
	2K	S-25C020A H	-40 to 105°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-7
	4K	S-25C040A H	-40 to 105°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-7
	8K	S-25C080A H	-40 to 105°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-7
	16K	S-25C160A H	-40 to 105°C	2.5 to 5.5V	5MHz max.	5ms max.	300,000 cycles	25 years	●	●	●	●	●	●	●		9-8
	32K	S-25C320A H	-40 to 105°C	2.5 to 5.5V	5MHz max.	5ms max.	300,000 cycles	25 years	●	●	●	●	●	●	●		9-8
	64K	S-25C640A H	-40 to 105°C	2.5 to 5.5V	5MHz max.	5ms max.	300,000 cycles	25 years	●	●	●	●	●	●	●		9-8
	128K	S-25C128A H	-40 to 105°C	2.5 to 5.5V	5MHz max.	5ms max.	300,000 cycles	25 years	●	●	●	●	●	●	●		9-9
	1K	S-25A010A	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-4
	2K	S-25A020A	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-4
	4K	S-25A040A	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-4
	8K	S-25A080A	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-5
	16K	S-25A160A	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-5
	32K	S-25A320A	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-5
	64K	S-25A640A	-40 to 125°C	2.5 to 5.5V	5MHz max.	4ms max.	1 million cycles	50 years	●	●	●	●	●	●	●		9-5
	8K	S-25A080B	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	5ms max.	700,000 cycles	50 years	●	●	●	●	●	●	●		9-5
	16K	S-25A160B	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	5ms max.	700,000 cycles	50 years	●	●	●	●	●	●	●		9-5
	32K	S-25A320B	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	5ms max.	700,000 cycles	50 years	●	●	●	●	●	●	●		9-5
	64K	S-25A640B	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	5ms max.	700,000 cycles	50 years	●	●	●	●	●	●	●		9-5
128K	S-25A128B	-40 to 125°C	2.5 to 5.5V	6.5MHz max.	5ms max.	700,000 cycles	50 years	●	●	●	●	●	●	●		9-6	
256K	S-25A256B	-40 to 125°C	2.5 to 5.5V	5MHz max.	5ms max.	700,000 cycles	50 years	●	●	●	●	●	●	●		9-6	

\*1: LVDET: Write protect function during the low power supply voltage \*2: CPM: Function to protect against write due to erroneous instruction recognition \*3: READ operation only. WRITE operation: 1.8 to 5.5V

Ope. type	Example application	Series name	Pole detection	Power supply voltage range 2.5V 3.5V 4.5V 5.5V ---26V	Output delay time (typ.) 8μs 16μs	Chopping frequency (typ.) 250kHz 500kHz	Current consumption (typ.)	Magnetic sensitivity (Ta=+25°C)								Operation temperature Junction temperature				Output form	Output logic	Package				Page			
								0mT	0.5mT	1.5mT	2.2mT	3.0mT	6.0mT	10mT	15mT	-40°C	125°C	150°C	170°C			HST1-6(2025)	SOT-23-3	SOT-23-3S	TSOT-23-3S				
Switch type	Open/close detection	S-57GD S	Omnipolar	2.7 to 26V <sup>1</sup>	●	●	4.0mA	●	●	●	●	●	●	●	●	●	●	●	●	Nch open-drain output, Nch driver + Built-in pull-up resistor (1.2kΩ typ.)	Active "L", Active "H"	●			●	9-12			
	Press detection	S-57GS S	S pole					●	●	●	●	●	●	●	●	●	●	●	●	●		●	Nch open-drain output, Nch driver + Built-in pull-up resistor (1.2kΩ typ.)	●			●	9-12	
	Slide detection	S-57GN S	N pole					●	●	●	●	●	●	●	●	●	●	●	●	●		●	Nch open-drain output, Nch driver + Built-in pull-up resistor (1.2kΩ typ.)	●			●	9-12	
	Level detection Position detection	S-57A1 A	S pole, N pole					3.5 to 26V	●	●	3.0mA				●	●							Nch open-drain output, Nch driver + Built-in pull-up resistor (10kΩ typ.)		●			9-13	
Latch typeae	Motor control Rotation speed detection	S-57TZ S	ZCL	2.7 to 26V <sup>1</sup>	●	●	4.0mA	●										●	Nch open-drain output, Nch driver + Built-in pull-up resistor (1.2kΩ typ.)	V <sub>OUT</sub> = "L" at S pole detection, V <sub>OUT</sub> = "H" at S pole detection	●			●	9-13				
		S-57RB S	Bipolar					●	●	●	●	●	●	●	●	●	●	●	●		●	●	Nch open-drain output, Nch driver + Built-in pull-up resistor (1.2kΩ typ.)	●			●	9-14	
		S-57P1 S	Bipolar					2.7 to 26V	●	●	3.0mA	●	●	●	●	●	●	●	●		●	●	●	Nch open-drain output			●		9-14
		S-57K1 A	Bipolar					3.5 to 26V	●	●	3.0mA					●	●						●	Nch open-drain output, Nch driver + Built-in pull-up resistor (10kΩ typ.)		●			9-15

\*1: When output form is Nch driver + built-in pull-up resistor (1.2kΩ typ.): 2.7 to 5.5V

\*2: Release point (S pole) (the magnetic flux density value when the magnetic flux density applied to the IC is increased and the output voltage hold state is released) can be selected from 3.0mT or 6.0mT. The accuracy shown is for the TSOT-23-3S, release point (S pole) = 3.0mT product.

Series name	Number of circuits	Input rail-to-rail	Operating voltage range	Current consumption (typ.) (Per circuit)	Input offset voltage (max.) (Whole temperature range)	Gain-bandwidth product	Slew rate	Operating temperature range	Package	Page
									TMSOP-8	
S-19610A	2	—	2.7 to 5.5V	1.0mA	6.0mV	3.0MHz	2.0V/ $\mu$ s	−40 to +125°C	●	9-16
S-19611A	2	✓	2.65 to 5.5V	200 $\mu$ A	100 $\mu$ V	320kHz	0.22V/ $\mu$ s	−40 to +105°C	●	9-16
S-19630A	2	✓	4.0 to 36.0V	250 $\mu$ A	50 $\mu$ V	1.2MHz	0.45V/ $\mu$ s	−40 to +125°C	●	9-16

Series name	Communication method	Operating voltage range	Operating voltage at time keeping	Current consumption (V <sub>DD</sub> =3.0V, Ta=25°C)	Oscillation frequency deviation between ICs	Oscillation frequency voltage deviation	Features	Operation temperature range	Package		Page
									8-Pin SOP	8-Pin TSSOP	
S-35190A H	3-wire	1.3 to 5.5V	1.1 to 5.5V	0.25μA	±10ppm	±3ppm	Clock correction Free user register	-40 to +105°C	●	●	9-17
S-35390A H	2-wire	1.3 to 5.5V	1.1 to 5.5V	0.25μA	±10ppm	±3ppm	Clock correction Free user register	-40 to +105°C	●	●	9-17

## Convenience Timers for Automotive Use

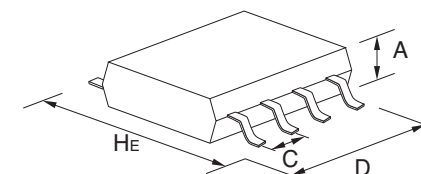
Series name	Function overview	Control pin	Output pin	Output type	Output setting item	Output (time) setting method	Settable time (frequency) range	Time-out type (only one can be selected)	Package		Page
									TMSOP-8	HSOP-8Q	
S-35710M A	•2-wire •Built-in quartz crystal	$\overline{\text{RST}}$	INT	Time-out	Time-out time	Software setting 2-wire (I <sup>2</sup> C-bus)	1 sec to 194 days	Handshake		●	9-18
S-35710 A	•2-wire	$\overline{\text{RST}}$	INT	Time-out	Time-out time	Software setting 2-wire (I <sup>2</sup> C-bus)	1 sec to 194 days	One-shot loop or handshake	●		9-18
S-35720 A	•With interrupt time setting pin	$\overline{\text{RST}}$	INT	Time-out	Time-out time	Hardware setting SET0/SET1 setting pin	1 sec to 194 days (4 values can be set) * Toggle selects 1 value	One-shot loop or handshake or toggle	●		9-18
S-35730 A	•With frequency setting pin •Clock pulse output	ENBL	FOUT	Clock pulse	Clock pulse frequency	Hardware setting SET0/SET1 setting pin	32.768kHz to 1Hz (4 values can be set) Duty is fixed at 50%	—	●		9-18
S-35740 A	•2-wire •Interval timer	ENBL	INT	Clock pulse	Intermittent operation frequency	Software setting 2-wire (I <sup>2</sup> C-bus)	1.024kHz to 1Hz Duty is adjustable	—	●		9-19
S-35770 A	•2-wire •Counter	$\overline{\text{RST}}$ CLKIN	SDA	Count value read	—	—	—	—	●		9-19

## Package List

Package Type	Pin Count	Package Name	Package Size (mm)			Pitch (mm)
			H <sub>E</sub>	D	A (max.)	C
Lead insertion type	3	TO-92	7.0	5.2	4.2	2.5/1.27
	3	TO-92S	4.95	4.1	1.62	2.5/1.27
Flat-lead type	3	SOT-89-3	4.0	4.5	1.6	1.5
	5	SOT-89-5	4.5	4.5	1.6	1.5
Gull-wing type	4	SC-82AB	2.1	2.0	1.1	1.3
	5	SC-88A	2.1	2.0	1.1	0.65
	3	SOT-23-3	2.8	2.9	1.3	1.9
	3	SOT-23-3S	2.8	2.9	1.2	1.9
	3	TSOT-23-3S	2.85	2.9	0.8	1.9
	5	SOT-23-5	2.8	2.9	1.3	0.95
	6	SOT-23-6	2.8	2.9	1.35	0.95
	6	SOT-23-6W	2.8	2.9	1.3	0.95
	8	8-Pin SOP (JEDEC)	6.0	5.02	1.75	1.27
	8	8-Pin TSSOP	6.4	3.0	1.1	0.65
	8	8-Pin TSSOP	6.4	3.0	1.1	0.65
	16	16-Pin TSSOP	6.4	5.1	1.1	0.65
	20	20-Pin TSSOP	6.4	6.5	1.2	0.65
	24	24-Pin SSOP	7.6	7.9	1.4	0.65
	8	TMSOP-8	4.0	2.9	0.8	0.65
	8	HTMSOP-8	4.0	2.9	0.8	0.65
	16	HTSSOP-16	6.4	5.12	1.1	0.65
	6	HSOP-6	6.0	5.02	1.75	1.91
	8	HSOP-8A	6.0	5.02	1.68	1.27
	8	HSOP-8A	6.0	5.02	1.65	1.27
	8	HSOP-8Q	6.0	5.02	1.68	1.27
	5	TO-252-5S(A)	6.5	6.5	1.4	1.27
	9	TO-252-9S	6.5	6.5	1.4	0.65

Package Type	Pin Count	Package Name	Package Size (mm)			Pitch (mm)
			H <sub>E</sub>	D	A (max.)	C
Non-lead type	6	6-Pin HSON(A)	3.0	2.9	0.9	0.95
	6	SON-6C	2.55	1.56	0.65	0.5
	4	SNT-4A	1.6	1.2	0.5	0.65
	6	SNT-6A SNT-6A(H)	1.8	1.57	0.5	0.5
	8	SNT-8A	2.46	1.97	0.5	0.5
	4	HSNT-4(0808)	0.8	0.8	0.4	0.4
	4	HSNT-4(0808)B	0.8	0.8	0.41	0.4
	4	HSNT-4(1010)	1.0	1.0	0.4	0.65
	4	HSNT-4(1010)B	1.0	1.0	0.41	0.65
	6	HSNT-6(1212)	1.2	1.2	0.4	0.4
	6	HSNT-6A	2.46	1.96	0.5	0.5
	6	HSNT-6(2025)	2.46	1.96	0.5	0.5
	8	HSNT-8(1616)	1.6	1.6	0.4	0.4
	8	HSNT-8(2030)	3.0	2.0	0.5	0.5
	6	DFN-6(1414)A	1.4	1.4	0.6	0.5
	6	DFN-6(1518)A	1.8	1.5	0.33	0.5
	8	DFN-8(1616)A	1.6	1.6	0.6	0.4
	8	DFN-8(2030)	3.0	2.0	0.5	0.5
	8	DFN-8(2030)A	3.0	2.0	0.6	0.5
	8	DFN-8(2030)B	3.0	2.0	0.8	0.5

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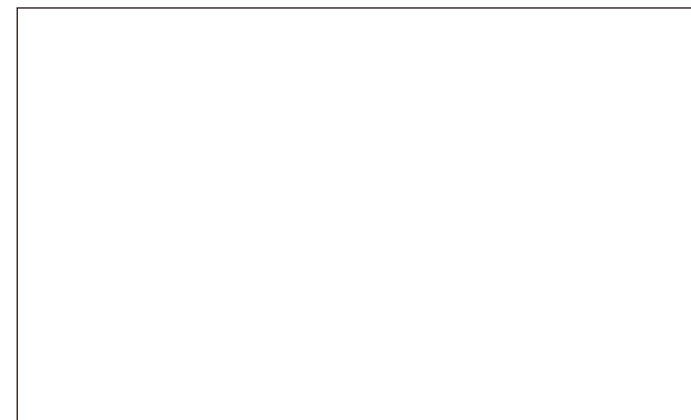
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