MM3280series

OUTLINE

The MM3280 series are protection IC using high voltage CMOS process for overcharge, overdischarge and overcurrent protection of the rechargeable Lithium-ion or Lithium-polymer battery. The overcharge, overdischarge, discharging overcurrent, short, chargi

FEATURES

(Unless otherwise specified, Topr=+25℃)

1) Range and accuracy of detection/release voltage

・Overcharge detection voltage	3.6V to 5.0V, 5mV steps	Accuracy±20mV
		Accuracy±25mV (Topr=-5 to +60℃)
・Overcharge release voltage	3.6V to 4.5V, 50mV steps	Accuracy±30mV
・Overdischarge detection voltage	2.0V to 3.0V, 50mV steps	Accuracy±35mV
・Overdischarge release voltage	2.0V to 3.5V, 50mV steps	Accuracy±100mV
・Discharging overcurrent detection voltage	+50mV to +300mV, 5mV steps	Accuracy±10mV
・Charging overcurrent detection voltage ※1	-50mV to -300mV, 5mV steps	Accuracy±20mV
・Short detection voltage	Selection from 0.7V, 0.8V, 0.9V	Accuracy±100mV
・Over voltage charger detection voltage ※1	VDD-8.0V fixed	Accuracy±2.0V
・Over voltage charger release voltage ※1	VDD-7.3V fixed	Accuracy±2.0V

2) Range of detection delay time

・Overcharge detection delay time	Selection from 0.25s, 1.0s, 1.2s, 4.5s
・Overdischarge detection delay time	Selection from 20ms, 24ms, 96ms, 125ms, 128ms, 144ms
・Discharging overcurrent detection delay time	Selection from 8ms, 12ms, 16ms, 20ms, 24ms, 48ms 96ms, 160ms,
・Charging overcurrent detection delay time	Selection from 4ms, 6ms, 8ms, 10ms, 12ms, 16ms, 96ms
・Short detection delay time	Selection from 200us, 300us, 400us

3) 0V battery charge function — Selection from "Prohibition" or "Permission"

4) The overcharge detection delay timer reset time function (function for the pulse charge) is provided. ※1

5) Low current consumption

・Normal mode	Typ. 3.0uA, Max. 6.0uA
・Stand-by mode	Max. 0.1uA (For "Charger connection release" the overdischarge release condition.)
	Max. 0.5uA (For "Voltage release" the overdischarge release condition.)

6) Absolute maximum ratings

・VDD pin	VSS-0.3V to 12V
・COUT pin and V- pin	VDD-28V to VDD+0.3V
・DOUT pin	VSS-0.3V to VDD+0.3V
・Storage temperature	-55 to +125℃
・Operation temperature	-40 to +85℃

7) Package type

・SSON-6E	1.60 × 1.80 × 0.55 [mm]
・SSON-6J	1.40 × 1.40 × 0.55 [mm]
・SSON-6K	2.00 × 2.00 × 0.75 [mm]
・SON-6C	1.60 × 2.00 × 0.60 [mm]
・SOT-26A, SOT-26B	2.90 × 2.80 × 1.15 [mm]

※1 Optional function
※2 Please inquire to us, if you need another spec.

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, Topr=+25℃

Parameter	Symbol	Conditions	Min.	Typ.	Max.	unit
INPUT/OUTPUT VOLTAGE						
Operating input voltage	VDD1	VDD-VSS	1.5	-	5.5	V
Maximum forbidden voltage for 0V charging ※1	Vst	"Prohibition" function	0.6	0.9	1.2	V
Minimum operating voltage for 0V charging ※1		"Permission" function	-	-	1.2	V
COUT pin Nch ON voltage	Vol1	Iol=30uA, VDD=4.5V	-	0.4	0.5	V
COUT pin Pch ON voltage	Voh1	Ioh=-30uA, VDD=3.9V	3.4	3.7	-	V
DOUT pin Nch ON voltage	Vol2	Iol=30uA, VDD=2.0V	-	0.2	0.5	V
DOUT pin Pch ON voltage	Voh2	Ioh=-30uA, VDD=3.9V	3.4	3.7	-	V
CURRENT CONSUMPTION						
Current consumption	Idd	VDD=3.9V, V-=0V	-	3.0	6.0	uA
Current consumption at stand-by	Is	Vdet2＝Vrel2 ※2	-	-	0.1	uA
		Vdet2≠Vrel2 ※3	-	-	0.5	uA
DETECTION/RELEASE VOLTAGE						
Overcharge detection voltage	Vdet1	Ta=+25℃	Typ-0.020	Vdet1	Typ+0.020	V
		Ta=-5～+60℃	Typ-0.025		Typ+0.025	
Overcharge release voltage	Vrel1	Vdet1≠Vrel1	Typ-0.030	Vrel1	Typ+0.030	V
Overdischarge detection voltage	Vdet2		Typ-0.035	Vdet2	Typ+0.035	V
Overdischarge release voltage	Vrel2	Vdet2≠Vrel2	Typ-0.100	Vrel2	Typ+0.100	V
Discharging overcurrent detection voltage	Vdet3		Typ-0.010	Vdet3	Typ+0.010	V
Charging overcurrent detection voltage ※4	Vdet4		Typ-0.020	Vdet4	Typ+0.020	V
Short detection voltage	Vshort		Typ-0.100	Vshort	Typ+0.100	V
Over voltage charger detection voltage ※4	Vchg1		6.0	8.0	10.0	V
Over voltage charger release voltage ※4	Vchg2		5.3	7.3	9.3	V
DETECTION DELAY TIME						
Overcharge detection delay time	tVdet1		Typ*0.8	tVdet1	Typ*1.2	s
Overcharge detection delay timer reset time ※4	tVrst1		11.2	16.0	21.6	ms
Overdischarge detection delay time	tVdet2		Typ*0.8	tVdet2	Typ*1.2	ms
Discharging overcurrent detection delay time	tVdet3			tVdet3		ms
Charging overcurrent detection delay time ※4	tVdet4			tVdet4		ms
Short detection delay time	tshort		Typ*0.7	tshort	Typ*1.4	us

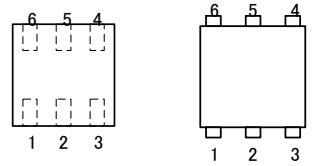
※1 0V battery charge function is selected from "Prohibition" or "Permission".

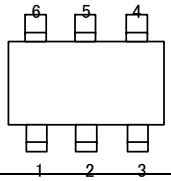
※2 The release condition from the overdischarge is "Charger connection release"

※3 The release condition from the overdischarge is "Voltage release"

※4 Optional function

PIN EXPLANATIONS

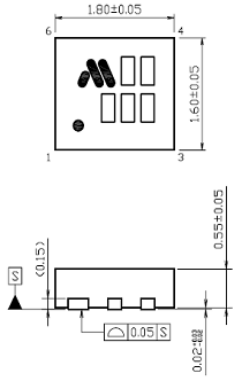
Top view		Pin No.				Symbol	Function
SSON-6E/6J/6K	SON-6C	Ver1	Ver2	Ver3	Ver4		
		1	6	2	6	V-	Input terminal connected to charger negative voltage.
		2	1	1	2	COUT	Output of overcharge detection.
		3	3	3	3	DOUT	Output of overdischarge detection.
		4	4	4	4	VSS	VSS terminal. Connected to ground.
		5	5	5	5	VDD	VDD terminal. Connected to IC substrate.
		6	2	6	1	DS / NC	Delay shorten terminal or No connection.

Top view	Pin No.	Symbol	Function
SOT-26A/26B			
	1	DOUT	Output of overdischarge detection.
	2	V-	Input terminal connected to charger negative voltage.
	3	COUT	Output of overcharge detection.
	4	DS	Delay shorten terminal.
	5	VDD	VDD terminal. Connected to IC substrate.
	6	VSS	VSS terminal. Connected to ground.

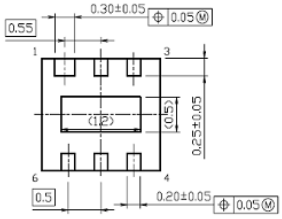
PACKAGE DIMENSIONS

SSON-6E

表面(Top View)

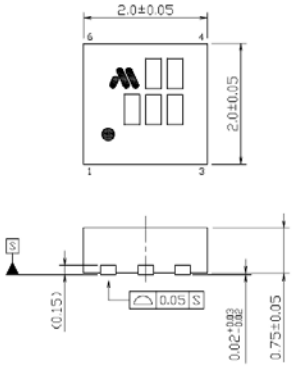


裏面(Bottom View)

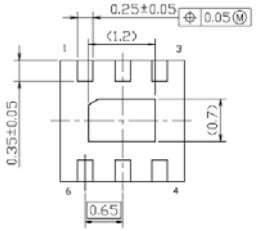


SSON-6K

表面(Top View)

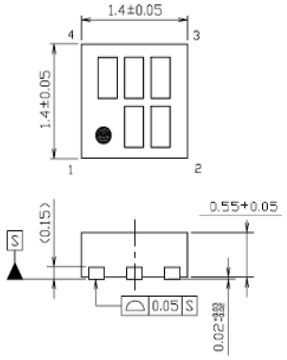


裏面(Bottom View)

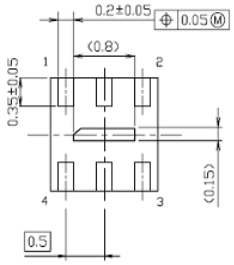


SSON-6J

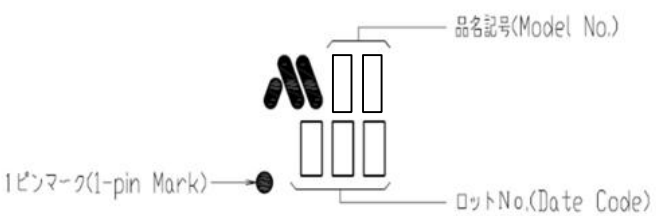
表面(Top View)



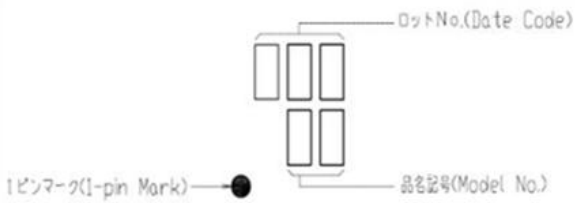
裏面(Bottom View)



マーク内容(Marking Contents)/SSON-6E、6K

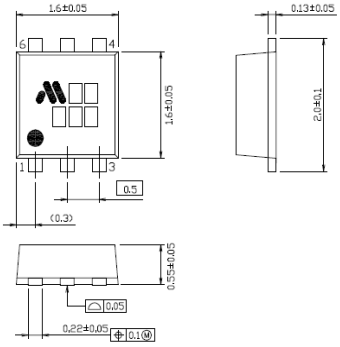


マーク内容(Marking Contents)/SS0N-6J

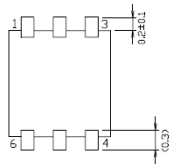


SON-6C

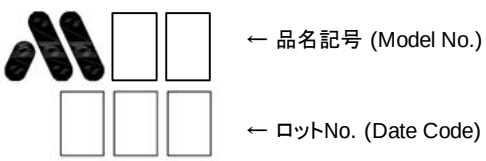
表面(Top View)



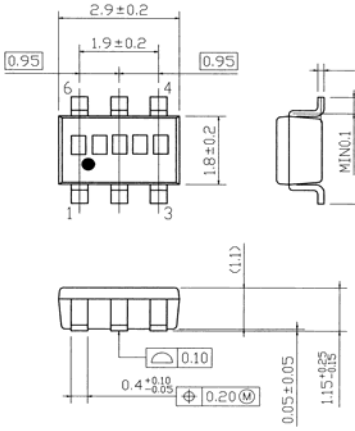
裏面(Bottom View)



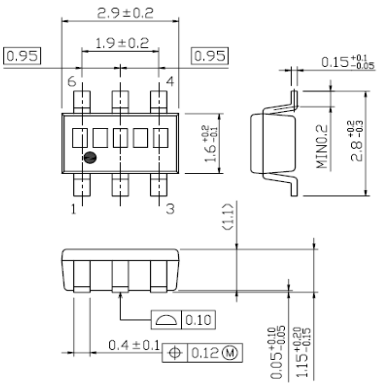
マーク内容(Marking Contents)/S0N-6C



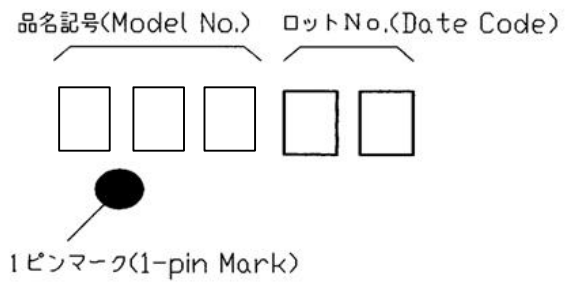
SOT-26A



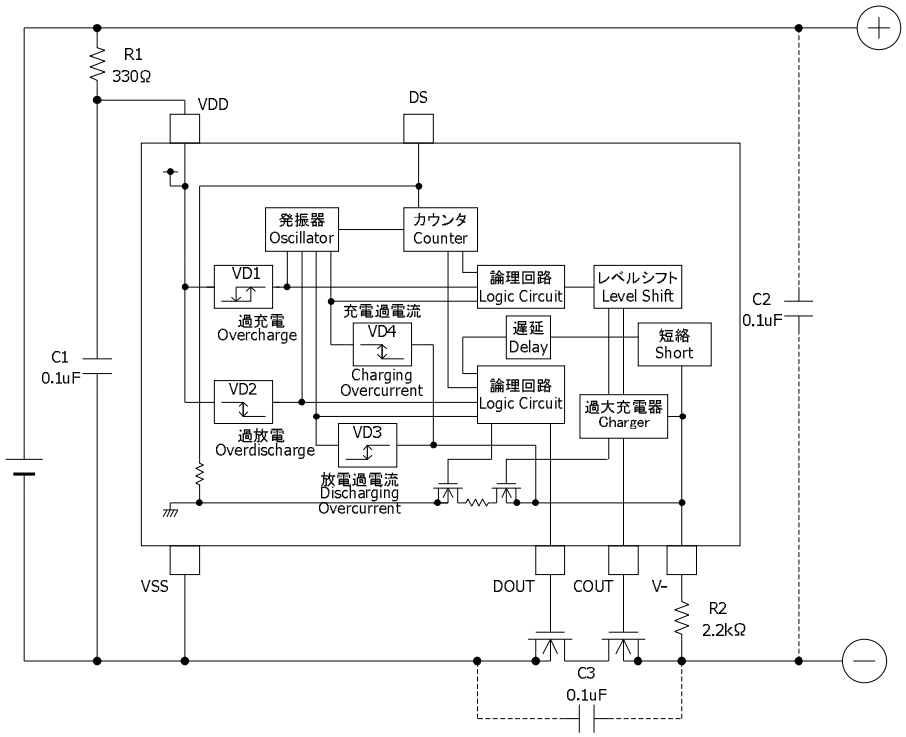
SOT-26B



マーク内容(Marking Contents)/S0T-26A、B



BLOCK DIAGRAM / TYPICAL APPLICATION CIRCUIT



R1 and C1 stabilize a supply voltage ripple. However, the detection voltage rises by the current of penetration in IC of the voltage detection when R1 is enlarged, and the value of R1 is adjusted to 1kohm or less. Moreover, adjust the value of C1 to 0.01u

R1 and R2 resistors are current limit resistance if a charger is connected reversibly or a high-voltage charger that exceeds the absolute maximum rating is connected. R1 and R2 may cause a power consumption will be over rating of power dissipation, theref

C2 and C3 capacitors have effect that the system stability about voltage ripple or imported noise. After check characteristics, decide that these capacitors should be inserted or not, where should be inserted, and capacitance value, please.

PRODUCT NAME

MM3280□□□□□E(or H)

- Emboss tape, Halogen-free
- Packing tape housing R : R housing / L : L housing
- Packing type N : SOT-26A、B/SOT-25A / R : SSON-6J/6K/6E / Y : SON-6C
- Rank of detection voltage and delay time 01 to 99
- Rank of detection voltage and delay time A to Z

PRODUCT LINEUP

Status of current IC	Product name	Package	PIN No.	Model No.	Optional function				Detection / Release voltage							Detection delay time					Release function		
					0V battery charge function	Charging overcurrent detection	Over voltage charger detection	Overcharge detection delay timer reset time	Overcharge detection voltage	Overcharge release voltage	Overdischarge detection voltage	Overdischarge release voltage	Discharging overcurrent detection voltage	Charging overcurrent detection voltage	Short detection voltage	Overcharge detection delay time	Overdischarge detection delay time	Discharging overcurrent detection delay time	Charging overcurrent detection delay time	Short detection delay time	Overcharge release	Overdischarge release	Overcurrent release voltage
					※1	※2			Vdet1	Vrel1	Vdet2	Vrel2	Vdet3	Vdet4	Vshort	tVdet1	tVdet2	tVdet3	tVdet4	tshort			
									V	V	V	V	V	V	V	s	ms	ms	ms	us			
MP	MM3280A01RRE	SSON6J	1	A1	○	○	○	○	4.300	4.100	2.300	2.300	0.105	−0.100	0.9	4.500	125	12	16	400	Auto	Latch	Vdet3
ES	MM3280A01YRE	SON6C	1	A1	○	○	○	○	4.300	4.100	2.300	2.300	0.105	−0.100	0.9	4.500	125	12	16	400	Auto	Latch	Vdet3
MP	MM3280B04RRE	SSON6J	2	B4	×	○	○	○	4.445	4.245	2.300	2.300	0.060	−0.070	0.9	4.500	96	12	8	400	Auto	Latch	Vdet3
MP	MM3280B05RRE	SSON6J	2	B5	×	○	○	○	4.445	4.245	2.300	2.300	0.050	−0.070	0.3	4.500	96	160	8	400	Auto	Latch	Vdet3
ES	MM3280B07RRE	SSON6J	2	BA	×	○	○	○	4.445	4.245	2.300	2.300	0.055	−0.060	0.3	1.000	96	12	10	300	Auto	Latch	Vdet3
MP	MM3280C01RRE	SSON6K	3	C1	○	○	○	×	4.225	4.025	2.800	2.800	0.150	−0.150	0.9	1.000	96	12	6	400	Auto	Latch	Vdet3
MP	MM3280C01NRH	SOT26A/B	3	81C	○	○	○	×	4.225	4.025	2.800	2.800	0.150	−0.150	0.9	1.000	96	12	6	400	Auto	Latch	Vdet3
MP	MM3280C04RRE	SSON6K	3	C4	○	○	○	×	4.275	4.175	2.300	2.300	0.150	−0.150	0.9	1.000	96	12	6	400	Auto	Latch	Vdet3
MP	MM3280C05RRE	SSON6K	3	C5	○	○	○	×	4.375	4.275	2.300	2.300	0.200	−0.150	0.9	1.000	96	12	6	400	Auto	Latch	Vdet3
ES	MM3280D01NRH	SOT25A	−	80D	○	○	×	×	4.275	4.075	2.800	3.100	0.100	−0.100	0.9	0.250	144	16	8	400	Auto	Auto	Vdet3
ES	MM3280E01YRE	SON6C	1	E1	○	○	×	×	4.275	4.275	2.300	2.300	0.100	−0.100	0.9	1.000	20	6	8	400	Latch	Latch	Vdet3
ES	MM3280EA1YRE	SON6C	4	GR	○	○	×	×	4.275	4.075	2.500	2.900	0.130	−0.130	0.7	1.024	96	12	8	300	Auto	Auto	VDD−0.9V
ES	MM3280EA2RRE	SSON6J	4	7R	○	○	×	×	4.425	4.225	2.500	2.900	0.130	−0.130	0.7	1.024	96	12	8	300	Auto	Auto	VDD−0.9V
MP	MM3280EA3YRE	SON6C	4	GS	○	○	×	×	4.415	4.215	2.500	2.900	0.100	−0.100	0.3	1.024	96	12	8	300	Auto	Auto	VDD−0.9V
MP	MM3280EA4YRE	SON6C	4	GV	○	○	×	×	4.425	4.225	3.000	3.200	0.130	−0.130	0.7	1.024	96	12	8	300	Auto	Auto	VDD−0.9V
MP	MM3280EA5YRE	SON6C	4	GX	○	○	×	×	4.425	4.225	2.800	3.000	0.130	−0.130	0.7	1.024	96	12	8	300	Auto	Auto	VDD−0.9V
MP	MM3280EA6YRE	SON6C	4	GY	○	○	×	×	4.420	4.220	2.500	2.900	0.050	−0.040	0.3	1.024	64	12	8	300	Auto	Auto	VDD−0.9V
ES	MM3280EA9YRE	SON6C	4	KC	○	○	×	×	4.425	4.225	2.500	2.800	0.130	−0.100	0.5	1.024	32	8	8	250	Auto	Auto	VDD−0.9V
ES	MM3280EB1RRE	SSON6J	4	7S	×	○	×	×	4.425	4.225	2.500	2.900	0.130	−0.130	0.7	1.024	96	12	8	300	Auto	Auto	VDD−0.9V
MP	MM3280EB2YRE	SON6C	4	GT	×	○	×	×	4.415	4.215	2.500	2.900	0.100	−0.100	0.3	1.024	96	12	8	300	Auto	Auto	VDD−0.9V
ES	**MM3280EB3YRE**	**SON6C**	**4**	**GU**	**×**	**○**	**×**	**×**	**4.450**	**4.250**	**2.500**	**2.900**	**0.100**	**−0.100**	**0.3**	**1.024**	**96**	**12**	**8**	**300**	**Auto**	**Auto**	VDD−0.9V
ES	MM3280EB4YRE	SON6C	4	GZ	×	○	×	×	4.420	4.220	2.500	2.900	0.050	−0.040	0.3	1.024	64	12	8	300	Auto	Auto	VDD−0.9V
ES	MM3280EB5YRE	SON6C	4	GP	×	○	×	×	4.475	4.275	2.500	2.900	0.130	−0.100	0.3	1.024	96	12	8	300	Auto	Auto	VDD−0.9V
MP	MM3280F02RRE	SSON6J	1	F2	○	×	○	×	4.300	4.100	2.300	2.300	0.130	−	0.9	1.000	24	12	−	400	Latch	Latch	Vdet3
MP	MM3280G01RRE	SSON6J	1	G1	×	×	○	×	4.280	4.100	2.300	2.300	0.050	−	0.9	1.000	24	12	−	400	Auto	Latch	Vdet3
MP	MM3280G02RRE	SSON6J	1	G2	×	×	○	×	4.280	4.100	2.800	2.800	0.050	−	0.9	1.000	24	12	−	400	Auto	Latch	Vdet3
MP	MM3280H01NRH	SOT26A/B	−	81H	○	×	○	×	4.275	4.175	3.000	3.200	0.150	−	0.9	1.000	125	12	−	400	Auto	Auto	Vdet3
MP	MM3280H02NRH	SOT26A/B	−	82H	○	×	○	×	4.280	4.100	2.300	2.500	0.150	−	0.9	1.000	24	12	−	400	Auto	Auto	Vdet3
MP	MM3280H03NRH	SOT26A/B	−	83H	○	×	○	×	4.215	4.115	2.800	2.900	0.150	−	0.9	1.000	24	12	−	400	Auto	Auto	Vdet3
MP	MM3280H04NRH	SOT26A/B	−	84H	○	×	○	×	3.800	3.600	2.300	2.500	0.100	−	0.9	1.000	125	12	−	400	Auto	Auto	Vdet3
MP	MM3280I01NRH	SOT26A/B	−	81I	○	×	○	×	4.250	4.050	2.500	3.000	0.150	−	0.9	1.000	24	12	−	400	Auto	Auto	Vdet3
MP	MM3280I02NRH	SOT26A/B	−	82I	○	×	○	×	4.250	4.050	2.500	3.000	0.100	−	0.9	1.000	24	12	−	400	Auto	Auto	Vdet3
MP	MM3280J01NRH	SOT26A/B	−	81J	○	○	×	×	4.250	4.050	2.500	3.000	0.200	−0.100	0.8	1.000	20	12	8	300	Auto	Auto	Vdet3
MP	MM3280J03NRH	SOT26A/B	−	83J	○	○	×	×	3.800	3.600	2.000	2.380	0.100	−0.100	0.8	1.000	96	20	12	300	Auto	Auto	Vdet3
MP	MM3280J04NRH	SOT26A/B	−	84J	○	○	×	×	4.275	4.215	3.000	3.200	0.150	−0.100	0.8	1.000	96	20	12	300	Auto	Auto	Vdet3
MP	MM3280J05NRH	SOT26A/B	−	85J	○	○	×	×	4.250	4.190	2.800	3.000	0.150	−0.100	0.8	1.000	96	20	12	300	Auto	Auto	Vdet3
MP	MM3280J07NRH	SOT26A/B	−	87J	○	○	×	×	4.250	4.190	2.500	3.000	0.100	−0.100	0.7	1.000	96	20	12	300	Auto	Auto	Vdet3
ES	MM3280J12NRH	SOT26A/B	−	8CJ	○	○	×	×	4.280	4.100	2.300	2.500	0.200	−0.200	0.8	1.000	20	12	8	300	Auto	Auto	Vdet3
ES	MM3280J16NRH	SOT26A/B	−	8EJ	○	○	×	×	4.280	4.230	2.500	3.000	0.100	−0.100	0.7	1.000	96	20	12	300	Auto	Auto	Vdet3
MP	MM3280JA1YRE	SON6C	4	J1	○	○	×	×	4.425	4.225	2.500	2.900	0.130	−0.130	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JB1NRH	SOT26A/B	−	8B1	○	○	×	×	4.425	4.225	2.500	2.900	0.130	−0.130	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JB2NRH	SOT26A/B	−	8B2	○	○	×	×	4.350	4.150	2.500	2.900	0.200	−0.100	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JB3NRH	SOT26A/B	−	8B3	○	○	×	×	4.375	4.275	2.800	3.000	0.170	−0.150	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
ES	MM3280JB4NRH	SOT26A/B	−	8B4	○	○	×	×	4.375	4.175	2.300	2.700	0.150	−0.150	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JB5NRH	SOT26A/B	−	8B5	○	○	×	×	4.400	4.300	2.800	3.000	0.150	−0.150	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JB7NRH	SOT26A/B	−	8B7	○	○	×	×	4.425	4.225	2.500	2.900	0.160	−0.160	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JC1YRE	SON6C	4	JC	○	○	×	×	4.380	4.180	2.600	3.000	0.180	−0.130	0.9	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JC2YRE	SON6C	4	C2	×	○	×	×	4.425	4.225	2.500	2.900	0.130	−0.130	0.7	1.000	96	12	10	300	Auto	Auto	VDD−0.9V
MP	MM3280JD2YRE	SON6C	4	DB	×	○	×	×	4.425	4.225	2.500	2.900	0.130	−0.130	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JD4YRE	SON6C	4	DD	×	○	×	×	4.425	4.225	2.300	2.650	0.170	−0.130	0.7	1.000	96	12	10	300	Auto	Auto	Vdet3
MP	MM3280JF1YRE	SON6C	4	AF	○	○	×	×	4.425	4.225	2.500	2.500	0.100	−0.100	0.5	1.000	96	12	10	300	Auto	Latch	Vdet3
MP	MM3280JF2YRE	SON6C	4	BF	○	○	×	×	4.425	4.225	2.500	2.500	0.150	−0.100	0.5	1.000	96	12	10	300	Auto	Latch	Vdet3
ES	MM3280JF3NRH	SOT25A	−	80J	○	○	×	×	4.280	4.080	2.800	2.800	0.150	−0.100	0.5	0.250	144	18	10	300	Auto	Latch	Vdet3
MP	MM3280JH1YRE	SON6C	4	AH	○	○	×	×	4.415	4.215	2.500	2.900	0.045	−0.045	0.3	1.000	96	12	10	300	Auto	Auto	VDD−0.9V
ES	MM3280JH1RRE	SSON6J	4	JB	○	○	×	×	4.415	4.215	2.500	2.900	0.045	−0.045	0.3	1.000	96	12	10	300	Auto	Auto	VDD−0.9V
MP	MM3280JH2YRE	SON6C	4	BH	○	○	×	×	4.415	4.215	2.500	2.900	0.080	−0.080	0.3	1.000	96	12	10	300	Auto	Auto	VDD−0.9V
ES	MM3280JH2RRE	SSON6J	4	JC	○	○	×	×	4.415	4.215	2.500	2.900	0.080	−0.080	0.3	1.000	96	12	10	300	Auto	Auto	VDD−0.9V
ES	MM3280JH6NRH	SOT26A/B	−	8B8	○	○	×	×	4.375	4.275	2.800	3.000	0.200	−0.150	0.6	1.000	96	12	10	300	Auto	Auto	VDD−0.9V

※1 0V battery charge function　　○ : Permission　× : Prohibition

※2 Optional functions　　○ : Provided.　× : Not provided.

Please inquire to us, if you request a rank other than the above.

PRODUCT LINEUP

Status of current IC	Product name	Package	PIN No.	Model No.	Optional function				Detection / Release voltage							Detection delay time					Release function		
					0V battery charge function	Charging overcurrent detection	Over voltage charger detection	Overcharge detection delay timer reset time	Overcharge detection voltage	Overcharge release voltage	Overdischarge detection voltage	Overdischarge release voltage	Discharging overcurrent detection voltage	Charging overcurrent detection voltage	Short detection voltage	Overcharge detection delay time	Overdischarge detection delay time	Discharging overcurrent detection delay time	Charging overcurrent detection delay time	Short detection delay time	Overcharge release	Overdischarge release	Overcurrent release voltage
					※1	※2			Vdet1	Vrel1	Vdet2	Vrel2	Vdet3	Vdet4	Vshort	tVdet1	tVdet2	tVdet3	tVdet4	tshort			
									V	V	V	V	V	V	V	s	ms	ms	ms	us			
ES	MM3280JH7NRH	SOT26A/B	–	8B9	○	○	×	×	4.425	4.325	2.800	3.000	0.200	−0.150	0.6	1.000	96	12	10	300	Auto	Auto	VDD−0.9V
ES	MM3280JH8NRH	SOT26A/B	–	8BA	○	○	×	×	4.280	4.080	2.800	3.000	0.150	−0.150	0.5	1.200	144	9	8	320	Auto	Auto	VDD−0.9V
ES	MM3280JL1YRE	SON6C	4	L0	×	○	×	×	4.400	4.200	2.900	2.900	0.100	−0.100	0.4	1.000	96	12	10	300	Auto	Latch	VDD−0.9V
MP	MM3280JM1YRE	SON6C	4	M0	×	○	×	×	4.400	4.200	2.900	2.900	0.100	−0.100	0.4	1.000	96	12	10	300	Auto	Latch	Vdet3
MP	MM3280N01YRE	SON6C	1	N1	○	○	×	×	4.280	4.180	2.300	2.300	0.160	−0.160	0.9	1.000	96	20	16	400	Latch	Latch	Vdet3
MP	MM3280P09RRE	SSON6J	2	P9	×	○	×	×	4.280	4.180	2.700	2.700	0.065	−0.075	0.9	1.000	96	20	18	400	Auto	Latch	Vdet3
MP	MM3280P10RRE	SSON6J	2	P0	×	○	×	×	4.280	4.100	2.300	2.300	0.170	−0.170	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280P12RRE	SSON6E	2	P2	○	○	×	×	4.280	4.100	2.300	2.300	0.150	−0.220	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280P16RRE	SSON6J	2	PA	×	○	×	×	4.280	4.100	2.300	2.300	0.160	−0.150	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280P17RRE	SSON6J	2	PB	×	○	×	×	4.280	4.100	2.300	2.300	0.120	−0.120	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
ES	MM3280P18RRE	SSON6J	2	PD	○	○	×	×	4.420	4.240	3.000	3.000	0.150	−0.220	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280P20RRE	SSON6J	2	PC	×	○	×	×	4.280	4.100	2.300	2.300	0.200	−0.120	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280P21RRE	SSON6J	2	PF	×	○	×	×	4.430	4.190	2.300	2.300	0.240	−0.250	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280P22RRE	SSON6J	2	PE	×	○	×	×	4.420	4.240	2.300	2.300	0.210	−0.220	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280P23RRE	SSON6J	2	PE	○	○	×	×	4.430	4.250	2.300	2.300	0.120	−0.120	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280P25RRE	SSON6J	2	PK	×	○	×	×	4.280	4.100	2.300	2.300	0.160	−0.100	0.9	1.000	128	24	4	400	Auto	Latch	Vdet3
ES	MM3280P26RRE	SSON6J	2	PL	×	○	×	×	4.420	4.240	2.300	2.300	0.170	−0.170	0.9	1.000	24	12	4	400	Auto	Latch	Vdet3
MP	MM3280PA1RRE	SSON6J	2	PH	×	○	×	×	4.420	4.420	2.300	2.300	0.115	−0.130	0.9	1.000	24	12	4	400	Latch	Latch	Vdet3
MP	MM3280PA6RRE	SSON6J	2	PN	○	○	×	×	4.370	4.370	2.300	2.300	0.140	−0.130	0.5	1.000	24	12	4	400	Latch	Latch	Vdet3
MP	MM3280PA7RRE	SSON6J	2	PR	×	○	×	×	4.430	4.430	2.800	2.800	0.080	−0.080	0.5	1.000	24	12	4	400	Latch	Latch	Vdet3
MP	MM3280S01NRH	SOT26A/B	–	81S	○	×	○	×	4.280	4.080	3.000	3.000	0.080	–	0.9	1.200	144	8	–	400	Auto	Latch	Vdet3
MP	MM3280S02RRE	SSON6J	1	S2	○	×	○	×	4.300	4.100	3.000	3.000	0.250	–	0.9	1.200	144	8	–	400	Auto	Latch	Vdet3
MP	MM3280T01NRH	SOT26A/B	–	81T	×	○	×	×	4.280	4.280	2.800	2.800	0.050	−0.100	0.9	1.000	20	6	8	200	Latch	Latch	Vdet3
MP	MM3280T02RRE	SSON6J	1	T2	×	○	×	×	4.280	4.280	2.800	2.800	0.050	−0.100	0.9	1.000	20	6	8	200	Latch	Latch	Vdet3
MP	MM3280T03NRH	SOT26A/B	–	83T	×	○	×	×	3.670	3.670	2.050	2.050	0.050	−0.060	0.4	1.000	96	96	96	400	Latch	Latch	Vdet3
ES	MM3280T04NRH	SOT26A/B	–	84T	×	○	×	×	4.280	4.280	2.400	2.400	0.050	−0.060	0.4	1.000	96	96	96	400	Latch	Latch	Vdet3
MP	MM3280W01NRH	SOT26A/B	–	812	○	○	○	×	4.280	4.280	2.300	2.500	0.150	−0.150	0.9	1.000	24	12	8	400	Latch	Auto	Vdet3
MP	MM3280W06NRH	SOT26A/B	–	862	×	○	○	×	4.325	4.325	2.500	2.900	0.150	−0.150	0.7	1.000	24	12	8	400	Latch	Auto	Vdet3
ES	MM3280W07NRH	SOT26A/B	–	872	○	○	○	×	4.350	4.350	2.300	2.500	0.150	−0.150	0.7	1.000	24	12	8	400	Latch	Auto	Vdet3

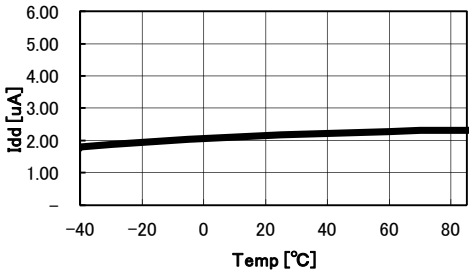
※1 0V battery charge function　　○ : Permission　× : Prohibition

※2 Optional functions　　○ : Provided.　× : Not provided.

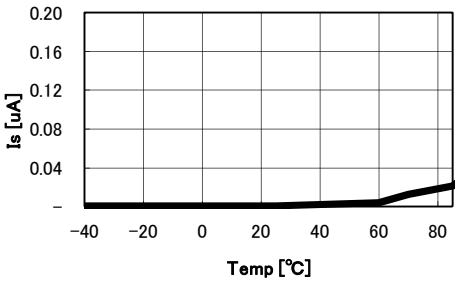
Please inquire to us, if you request a rank other than the above.

Temperature characteristics

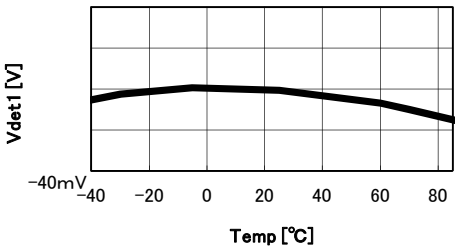
Current consumption



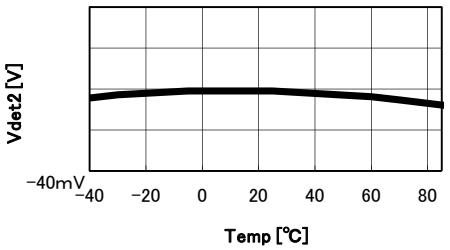
Current consumption at stand-by



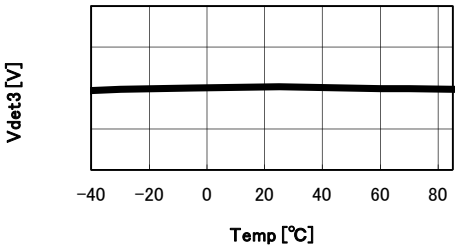
Overcharge detection voltage



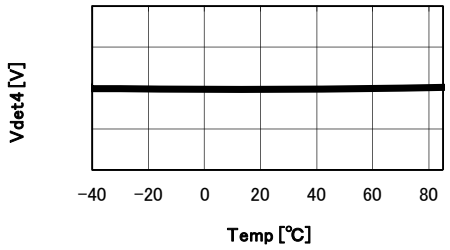
Overdischarge detection voltage



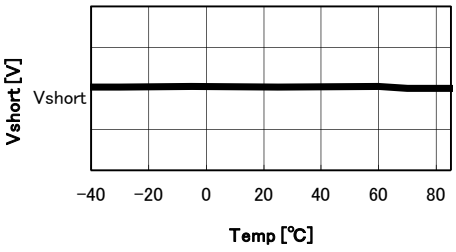
Discharging overcurrent detection voltage



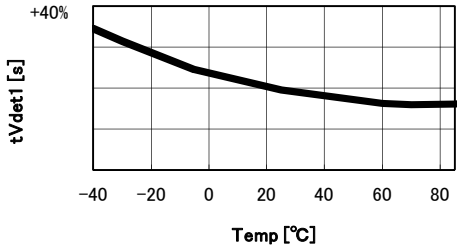
Charging overcurrent detection voltage



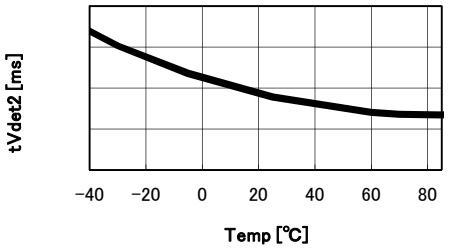
Short detection voltage



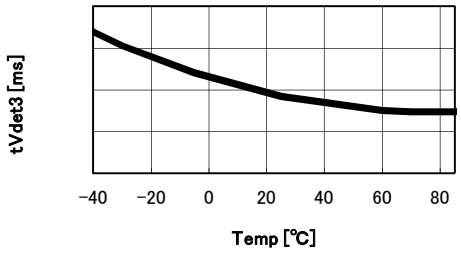
Overcharge detection delay time



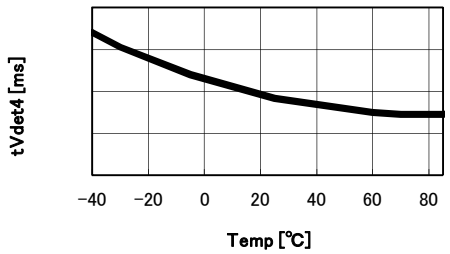
Overdischarge detection delay time



Discharging overcurrent detection delay time



Charging overcurrent detection delay time



Short detection delay time