

SMH Series

- Endurance with ripple current : 2,000 hours at 85°C
- Non solvent resistant type
- RoHS2 Compliant

SMM
↓
Downsized
Longer life

SMH

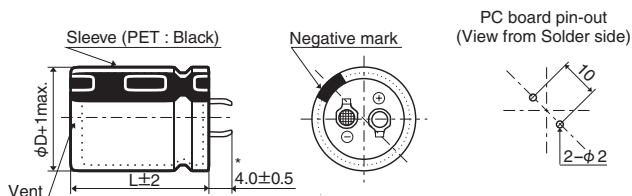


◆SPECIFICATIONS

Items	Characteristics										
Category	-40 to +85°C										
Temperature Range											
Rated Voltage Range	6.3 to 100V _{dc}										
Capacitance Tolerance	± 20% (M) (at 20°C, 120Hz)										
Leakage Current	I=0.02CV or 3mA, whichever is smaller. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)										
Dissipation Factor (tan δ)	Rated voltage (V _{dc})	6.3V	10V	16V	25V	35V	50V	63V	80V	100V	(at 20°C, 120Hz)
	tan δ (Max.)	0.60	0.50	0.40	0.30	0.25	0.20	0.15	0.15	0.15	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (V _{dc})	6.3V	10V	16V	25V	35V	50V	63V	80V	100V	(at 120Hz)
	Z(-25°C)/Z(+20°C)	4	4	4	3	3	2	2	2	2	
	Z(-40°C)/Z(+20°C)	15	15	15	10	8	6	6	5	5	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied (the peak voltage shall not exceed the rated voltage) for 2,000 hours at 85°C.										
	Capacitance change	≤ ±20% of the initial value									
	D.F. (tan δ)	≤200% of the initial specified value									
	Leakage current	≤The initial specified value									
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.										
	Capacitance change	≤ ±20% of the initial value									
	D.F. (tan δ)	≤150% of the initial specified value									
	Leakage current	≤The initial specified value									

◆DIMENSIONS [mm]

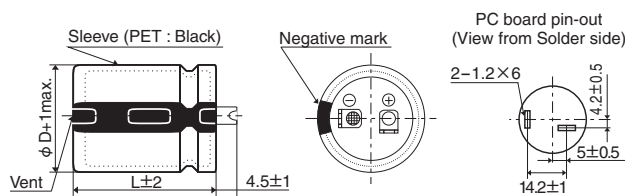
●Terminal Code : VS (φ22 to φ35) : Standard



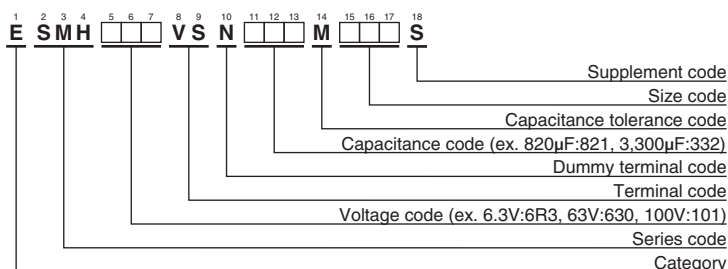
*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

●Terminal Code : LI (φ35)



◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"



◆STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (Arms/ 85°C, 120Hz)	Part No.	WV (V _{dc})	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (Arms/ 85°C, 120Hz)	Part No.
6.3	15,000	22 × 25	0.60	2.44	ESMH6R3VSN153MP25S	16	27,000	25.4 × 45	0.40	4.72	ESMH160VSN273MQ45S
	18,000	22 × 30	0.60	2.67	ESMH6R3VSN183MP30S		27,000	30 × 35	0.40	4.82	ESMH160VSN273MR35S
	18,000	25.4 × 25	0.60	2.70	ESMH6R3VSN183MQ25S		27,000	35 × 30	0.40	4.65	ESMH160VSN273MA30S
	22,000	22 × 30	0.60	3.06	ESMH6R3VSN223MP30S		33,000	25.4 × 50	0.40	5.33	ESMH160VSN333MQ50S
	22,000	25.4 × 25	0.60	3.07	ESMH6R3VSN223MQ25S		33,000	30 × 40	0.40	5.36	ESMH160VSN333MR40S
	27,000	22 × 35	0.60	3.49	ESMH6R3VSN273MP35S		33,000	35 × 30	0.40	5.15	ESMH160VSN333MA30S
	27,000	25.4 × 30	0.60	3.52	ESMH6R3VSN273MQ30S		39,000	30 × 45	0.40	6.01	ESMH160VSN393MR45S
	27,000	30 × 25	0.60	3.57	ESMH6R3VSN273MR25S		39,000	35 × 35	0.40	5.95	ESMH160VSN393MA35S
	33,000	22 × 40	0.60	3.97	ESMH6R3VSN333MP40S		47,000	30 × 50	0.40	6.79	ESMH160VSN473MR50S
	33,000	25.4 × 35	0.60	4.02	ESMH6R3VSN333MQ35S		47,000	35 × 40	0.40	6.76	ESMH160VSN473MA40S
	33,000	30 × 25	0.60	3.95	ESMH6R3VSN333MR25S		56,000	35 × 45	0.40	7.62	ESMH160VSN563MR45S
	39,000	22 × 50	0.60	4.55	ESMH6R3VSN393MP50S		68,000	35 × 50	0.40	8.63	ESMH160VSN683MA50S
	39,000	25.4 × 40	0.60	4.50	ESMH6R3VSN393MQ40S	25	5,600	22 × 25	0.30	2.21	ESMH250VSN562MP25S
	39,000	30 × 30	0.60	4.45	ESMH6R3VSN393MR30S		6,800	22 × 30	0.30	2.40	ESMH250VSN682MP30S
	39,000	35 × 25	0.60	4.51	ESMH6R3VSN393MA25S		6,800	25.4 × 25	0.30	2.56	ESMH250VSN682MQ25S
	47,000	25.4 × 45	0.60	5.09	ESMH6R3VSN473MQ45S		8,200	22 × 35	0.30	2.72	ESMH250VSN822MP35S
	47,000	30 × 35	0.60	5.06	ESMH6R3VSN473MR35S		8,200	25.4 × 25	0.30	2.80	ESMH250VSN822MQ25S
	47,000	35 × 30	0.60	5.01	ESMH6R3VSN473MA30S		10,000	22 × 40	0.30	3.09	ESMH250VSN103MP40S
	56,000	25.4 × 50	0.60	5.71	ESMH6R3VSN563MQ50S		10,000	25.4 × 30	0.30	3.12	ESMH250VSN103MQ30S
	56,000	30 × 40	0.60	5.70	ESMH6R3VSN563MR40S		10,000	30 × 25	0.30	3.21	ESMH250VSN103MR25S
	56,000	35 × 30	0.60	5.77	ESMH6R3VSN563MA30S		12,000	22 × 45	0.30	3.48	ESMH250VSN123MP45S
	68,000	30 × 45	0.60	6.48	ESMH6R3VSN683MR45S		12,000	25.4 × 35	0.30	3.43	ESMH250VSN123MQ35S
	68,000	35 × 35	0.60	6.42	ESMH6R3VSN683MA35S		12,000	30 × 30	0.30	3.86	ESMH250VSN123MR30S
	82,000	30 × 50	0.60	7.32	ESMH6R3VSN823MR50S		12,000	35 × 25	0.30	3.54	ESMH250VSN123MA25S
	82,000	35 × 40	0.60	7.29	ESMH6R3VSN823MA40S		15,000	22 × 50	0.30	4.00	ESMH250VSN153MP50S
	100,000	35 × 45	0.60	8.31	ESMH6R3VSN104MA45S		15,000	25.4 × 40	0.30	3.95	ESMH250VSN153MQ40S
10	12,000	22 × 25	0.50	2.39	ESMH100VSN123MP25S		15,000	30 × 30	0.30	4.00	ESMH250VSN153MR30S
	15,000	22 × 30	0.50	2.76	ESMH100VSN153MP30S		15,000	35 × 25	0.30	3.95	ESMH250VSN153MA25S
	15,000	25.4 × 25	0.50	2.77	ESMH100VSN153MQ25S		18,000	25.4 × 45	0.30	4.45	ESMH250VSN183MQ45S
	18,000	22 × 35	0.50	3.12	ESMH100VSN183MP35S		18,000	30 × 35	0.30	4.46	ESMH250VSN183MR35S
	18,000	25.4 × 25	0.50	3.04	ESMH100VSN183MQ25S		18,000	35 × 30	0.30	4.63	ESMH250VSN183MA30S
	22,000	22 × 40	0.50	3.55	ESMH100VSN223MP40S		22,000	25.4 × 50	0.30	5.02	ESMH250VSN223MQ50S
	22,000	25.4 × 30	0.50	3.48	ESMH100VSN223MQ30S		22,000	30 × 45	0.30	5.21	ESMH250VSN223MR45S
	22,000	30 × 25	0.50	3.53	ESMH100VSN223MR25S		22,000	35 × 35	0.30	5.16	ESMH250VSN223MA35S
	27,000	22 × 45	0.50	4.04	ESMH100VSN273MP45S		27,000	30 × 50	0.30	5.94	ESMH250VSN273MR50S
	27,000	25.4 × 35	0.50	3.98	ESMH100VSN273MQ35S		27,000	35 × 40	0.30	5.92	ESMH250VSN273MA40S
	27,000	30 × 30	0.50	3.73	ESMH100VSN273MR30S		33,000	35 × 45	0.30	6.75	ESMH250VSN333MA45S
	27,000	35 × 25	0.50	3.73	ESMH100VSN273MA25S		39,000	35 × 50	0.30	7.56	ESMH250VSN393MA50S
	33,000	22 × 50	0.50	4.58	ESMH100VSN333MP50S	35	3,900	22 × 25	0.25	2.22	ESMH350VSN392MP25S
	33,000	25.4 × 40	0.50	4.54	ESMH100VSN333MQ40S		4,700	22 × 30	0.25	2.41	ESMH350VSN472MP30S
	33,000	30 × 30	0.50	4.13	ESMH100VSN333MR30S		4,700	25.4 × 25	0.25	2.42	ESMH350VSN472MQ25S
	33,000	35 × 25	0.50	4.13	ESMH100VSN333MA25S		5,600	22 × 35	0.25	2.75	ESMH350VSN562MP35S
	39,000	25.4 × 45	0.50	5.08	ESMH100VSN393MQ45S		5,600	25.4 × 25	0.25	2.64	ESMH350VSN562MQ25S
	39,000	30 × 35	0.50	5.05	ESMH100VSN393MR35S		6,800	22 × 40	0.25	2.80	ESMH350VSN682MP40S
	39,000	35 × 30	0.50	4.80	ESMH100VSN393MA30S		6,800	25.4 × 30	0.25	2.74	ESMH350VSN682MQ30S
	47,000	25.4 × 50	0.50	5.73	ESMH100VSN473MQ50S		6,800	30 × 25	0.25	2.97	ESMH350VSN682MR25S
	47,000	30 × 40	0.50	5.72	ESMH100VSN473MR40S		8,200	22 × 45	0.25	3.47	ESMH350VSN822MP45S
	47,000	35 × 30	0.50	5.27	ESMH100VSN473MA30S		8,200	25.4 × 35	0.25	3.10	ESMH350VSN822MQ35S
	56,000	30 × 45	0.50	6.44	ESMH100VSN563MR45S		8,200	30 × 30	0.25	3.13	ESMH350VSN822MR30S
	56,000	35 × 35	0.50	6.38	ESMH100VSN563MA35S		8,200	35 × 25	0.25	2.73	ESMH350VSN822MA25S
	68,000	30 × 50	0.50	7.27	ESMH100VSN683MR50S		10,000	22 × 50	0.25	3.57	ESMH350VSN103MP50S
	68,000	35 × 40	0.50	7.27	ESMH100VSN683MA40S		10,000	25.4 × 40	0.25	3.53	ESMH350VSN103MQ40S
	82,000	35 × 50	0.50	8.49	ESMH100VSN823MA50S		10,000	30 × 30	0.25	3.46	ESMH350VSN103MR30S
16	8,200	22 × 25	0.40	2.51	ESMH160VSN822MP25S		10,000	35 × 25	0.25	3.02	ESMH350VSN103MA25S
	10,000	22 × 25	0.40	2.77	ESMH160VSN103MP25S		12,000	25.4 × 45	0.25	3.98	ESMH350VSN123MQ45S
	12,000	22 × 30	0.40	2.86	ESMH160VSN123MP30S		12,000	30 × 35	0.25	4.01	ESMH350VSN123MR35S
	12,000	25.4 × 25	0.40	2.95	ESMH160VSN123MQ25S		12,000	35 × 30	0.25	4.42	ESMH350VSN123MA30S
	15,000	22 × 35	0.40	3.29	ESMH160VSN153MP35S		15,000	25.4 × 50	0.25	4.54	ESMH350VSN153MQ50S
	15,000	25.4 × 30	0.40	3.46	ESMH160VSN153MQ30S		15,000	30 × 40	0.25	4.52	ESMH350VSN153MR40S
	15,000	30 × 25	0.40	3.66	ESMH160VSN153MR25S		15,000	35 × 35	0.25	5.01	ESMH350VSN153MA35S
	18,000	22 × 40	0.40	3.72	ESMH160VSN183MP40S		18,000	30 × 45	0.25	4.71	ESMH350VSN183MR45S
	18,000	25.4 × 35	0.40	3.98	ESMH160VSN183MQ35S		18,000	35 × 40	0.25	5.54	ESMH350VSN183MA40S
	18,000	30 × 25	0.40	4.00	ESMH160VSN183MR25S		22,000	30 × 50	0.25	5.33	ESMH350VSN223MR50S
	22,000	22 × 50	0.40	4.37	ESMH160VSN223MP50S		22,000	35 × 45	0.25	6.04	ESMH350VSN223MA45S
	22,000	25.4 × 40	0.40	4.26	ESMH160VSN223MQ40S		27,000	35 × 50	0.25	6.89	ESMH350VSN273MA50S
	22,000	30 × 30	0.40	4.21	ESMH160VSN223MR30S	50	2,200	22 × 25	0.20	1.91	ESMH500VSN222MP25S
	22,000	35 × 25	0.40	4.15	ESMH160VSN223MA25S		3,300	22 × 30	0.20	2.37	ESMH500VSN332MP30S



◆STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Case size φD×L(mm)	tan δ	Rated ripple current (Arms/ 85°C, 120Hz)	Part No.
50	3,300	25.4 × 25	0.20	2.38	ESMH500VSN332MQ25S
	3,900	22 × 35	0.20	2.65	ESMH500VSN392MP35S
	3,900	25.4 × 30	0.20	2.68	ESMH500VSN392MQ30S
	3,900	30 × 25	0.20	2.55	ESMH500VSN392MR25S
	4,700	22 × 40	0.20	2.99	ESMH500VSN472MP40S
	4,700	25.4 × 35	0.20	3.03	ESMH500VSN472MQ35S
	4,700	30 × 25	0.20	2.81	ESMH500VSN472MR25S
	5,600	22 × 45	0.20	3.36	ESMH500VSN562MP45S
	5,600	25.4 × 35	0.20	3.31	ESMH500VSN562MQ35S
	5,600	30 × 30	0.20	3.37	ESMH500VSN562MR30S
	5,600	35 × 25	0.20	3.42	ESMH500VSN562MA25S
	6,800	22 × 50	0.20	3.81	ESMH500VSN682MP50S
	6,800	25.4 × 40	0.20	3.81	ESMH500VSN682MQ40S
	6,800	30 × 35	0.20	3.85	ESMH500VSN682MR35S
	6,800	35 × 30	0.20	3.85	ESMH500VSN682MA30S
	8,200	25.4 × 50	0.20	4.37	ESMH500VSN822MQ50S
	8,200	30 × 40	0.20	4.36	ESMH500VSN822MR40S
	8,200	35 × 30	0.20	4.41	ESMH500VSN822MA30S
	10,000	30 × 45	0.20	4.97	ESMH500VSN103MR45S
	10,000	35 × 35	0.20	4.92	ESMH500VSN103MA35S
63	12,000	30 × 50	0.20	5.60	ESMH500VSN123MR50S
	12,000	35 × 40	0.20	5.58	ESMH500VSN123MA40S
	15,000	35 × 45	0.20	6.44	ESMH500VSN153MA45S
	18,000	35 × 50	0.20	6.71	ESMH500VSN183MA50S
	1,800	22 × 25	0.15	1.82	ESMH630VSN182MP25S
	2,200	22 × 30	0.15	2.31	ESMH630VSN222MP30S
	2,200	25.4 × 25	0.15	2.30	ESMH630VSN222MQ25S
	2,700	22 × 35	0.15	2.40	ESMH630VSN272MP35S
	2,700	25.4 × 25	0.15	2.40	ESMH630VSN272MQ25S
	3,300	22 × 35	0.15	2.62	ESMH630VSN332MP35S
	3,300	25.4 × 30	0.15	2.64	ESMH630VSN332MQ30S
	3,300	30 × 25	0.15	2.78	ESMH630VSN332MR25S
	3,900	22 × 40	0.15	2.93	ESMH630VSN392MP40S
	3,900	25.4 × 35	0.15	2.97	ESMH630VSN392MQ35S
	3,900	30 × 30	0.15	3.00	ESMH630VSN392MR30S
	3,900	35 × 25	0.15	3.00	ESMH630VSN392MA25S
	4,700	22 × 50	0.15	3.39	ESMH630VSN472MP50S
	4,700	25.4 × 40	0.15	3.36	ESMH630VSN472MQ40S
	4,700	30 × 30	0.15	3.32	ESMH630VSN472MR30S
	4,700	35 × 25	0.15	3.36	ESMH630VSN472MA25S
80	5,600	25.4 × 45	0.15	3.77	ESMH630VSN562MQ45S
	5,600	30 × 35	0.15	3.75	ESMH630VSN562MR35S
	5,600	35 × 30	0.15	3.76	ESMH630VSN562MA30S
	6,800	25.4 × 50	0.15	4.27	ESMH630VSN682MQ50S
	6,800	30 × 40	0.15	4.27	ESMH630VSN682MR40S
	6,800	35 × 30	0.15	4.15	ESMH630VSN682MA30S
	8,200	30 × 45	0.15	4.83	ESMH630VSN822MR45S
	8,200	35 × 35	0.15	4.79	ESMH630VSN822MA35S
	10,000	30 × 50	0.15	5.49	ESMH630VSN103MR50S
	10,000	35 × 40	0.15	5.47	ESMH630VSN103MA40S
	12,000	35 × 45	0.15	6.19	ESMH630VSN123MA45S
100	820	22 × 25	0.15	1.86	ESMH101VSN821MP25S
	1,200	22 × 30	0.15	2.09	ESMH101VSN122MP30S
	1,200	25.4 × 25	0.15	2.10	ESMH101VSN122MQ25S
	1,500	22 × 35	0.15	2.41	ESMH101VSN152MP35S
	1,500	25.4 × 30	0.15	2.43	ESMH101VSN152MQ30S
	1,500	30 × 25	0.15	2.46	ESMH101VSN152MR25S
	1,800	22 × 40	0.15	2.71	ESMH101VSN182MP40S
	1,800	25.4 × 35	0.15	2.75	ESMH101VSN182MQ35S
	1,800	30 × 25	0.15	2.72	ESMH101VSN182MR25S
	2,200	22 × 45	0.15	3.08	ESMH101VSN222MP45S
	2,200	25.4 × 40	0.15	3.13	ESMH101VSN222MQ40S
	2,200	30 × 30	0.15	3.09	ESMH101VSN222MR30S
	2,200	35 × 25	0.15	3.14	ESMH101VSN222MA25S
	2,700	22 × 50	0.15	3.53	ESMH101VSN272MP50S
	2,700	25.4 × 45	0.15	3.57	ESMH101VSN272MQ45S
	2,700	30 × 35	0.15	3.55	ESMH101VSN272MR35S
	2,700	35 × 30	0.15	3.71	ESMH101VSN272MA30S
	3,300	25.4 × 50	0.15	4.06	ESMH101VSN332MQ50S
	3,300	30 × 40	0.15	4.05	ESMH101VSN332MR40S
	3,300	35 × 30	0.15	4.05	ESMH101VSN332MA30S
120	3,900	30 × 45	0.15	4.54	ESMH101VSN392MR45S
	3,900	35 × 35	0.15	4.49	ESMH101VSN392MA35S
	4,700	30 × 50	0.15	5.13	ESMH101VSN472MR50S
	4,700	35 × 40	0.15	5.11	ESMH101VSN472MA40S
	5,600	35 × 45	0.15	5.75	ESMH101VSN562MA45S
	6,800	35 × 50	0.15	6.50	ESMH101VSN682MA50S
	8,200	35 × 50	0.15	7.45	ESMH101VSN822MA50S
	10,000	35 × 50	0.15	8.45	ESMH101VSN103MA50S

*For the rated voltage ≥ 160V_{dc}, please use SMQ series

◆RATED RIPPLE CURRENT MULTIPLIERS

●Frequency Multipliers

Frequency(Hz)	50	120	300	1k	10k	50k
6.3 to 50V _{dc}	0.95	1.00	1.03	1.05	1.08	1.08
63 to 100V _{dc}	0.92	1.00	1.07	1.13	1.19	1.20

The deterioration of aluminum electrolytic capacitors accelerates their life due to the internal heating produced by ripple current. For details, refer to Section "5-3 Ripple Current Effect on Lifetime" in the catalog, Technical Note.



- Always read "Notes on Use" before using the product in order to enable you to use the product correctly and prevent any faults and accidents from occurring.
- Request the Product Specification on the product of NIPPON CHEMI-CON CORPORATION to refer to it as well as this brochure prior to the order of the products. Some specific notes on use of the ordered product may be described in the specifications.
- The products listed in this catalog are designed and manufactured for general electronics equipment use and are not intended for use in applications that can adversely affect human life; where the malfunction of equipment may cause damage to life or property. In addition, our products are not intended to be used in specific applications that may cause a major social impact. Please consult with us in advance of usage of our products in the following listed applications. ① Aerospace equipment ② Power generation equipment such as thermal power, nuclear power etc. ③ Medical equipment ④ Transport equipment (automobiles, trains, ships, etc.) ⑤ Transportation control equipment ⑥ Disaster prevention / crime prevention equipment ⑦ Highly publicized information processing equipment ⑧ Submarine equipment ⑨ Other applications that are not considered general-purpose applications.
- The circuits described as examples in this catalog and the "delivery specifications" are featured in order to show the operations and usage of our products, however, this fact does not guarantee that the circuits are available to function in your equipment systems. We are not in any case responsible for any failures or damage caused by the use of information contained herein. You should examine our products, of which the characteristics are described in the "delivery specifications" and other documents, and determine whether or not our products suit your requirements according to the specifications of your equipment systems. Therefore, you bear final responsibility regarding the use of our products.
Please make sure that you take appropriate safety measures such as use of redundant design and malfunction prevention measures in order to prevent fatal accidents and/or fires in the event any of our products malfunction.
- We strongly recommend our customers to purchase Nippon Chemi-Con products only through our official sales channels. We assume no responsibility for any defects or damages caused by using products purchased from outside our official sales channel or of counterfeit goods. In addition, we will ask the customer to pay the investigation cost for products purchased outside our official sales channel.
- We reserve the right to discontinue production and delivery of products. We do not guarantee that all the products included in this catalog will be available in the future.
The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products
- We continually strive to improve the quality and reliability of our products, but in any case that our product does not meet our published specifications, please stop using it promptly and contact us immediately. As for compensation for non-conforming goods delivered by Chemi-Con, we will limit it only to goods found in non-compliance of our published specifications. This may be accomplished by a no cost replacement of non-conforming individual products, a credit of the piece price paid per each individual non-conforming product, or in other ways deemed necessary.
In addition, we have an established system with enhanced traceability, therefore we will limit the applicable lot items for any potential compensation.

[Part Numbering System](#)

[Part Numbering System \(Appendix\)](#)

[Standardization](#)

[Available Items by Manufacturing Locations](#)

[Environmental Measures](#)

[Technical Note](#)

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