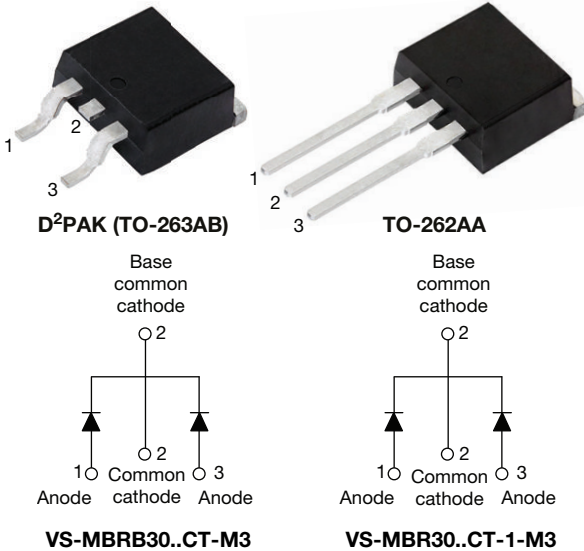




High Performance Schottky Rectifiers, 2 x 15 A



FEATURES

- 150 °C T_J operation
- Low forward voltage drop
- High frequency operation
- Center tap D²PAK and TO-262 packages
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

DESCRIPTION

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRIMARY CHARACTERISTICS	
I _{F(AV)}	2 x 15 A
V _R	35 V, 45 V
V _F at I _F	See datasheet
I _{RM} max.	100 mA at 125 °C
T _J max.	150 °C
E _{AS}	10 mJ
Package	D ² PAK (TO-263AB), TO-262AA
Circuit configuration	Common cathode

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I _{F(AV)}	Rectangular waveform (per device)	30	A
I _{FRM}	T _C = 123 °C (per leg)	30	
V _{FRRM}		35/45	V
I _{FSM}	t _p = 5 μs sine	1020	A
V _F	20 A _{pk} , T _J = 125 °C	0.6	V
T _J	Range	-65 to +150	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-MBRB3035CT-M3 VS-MBR3035CT-1-M3	VS-MBRB3045CT-M3 VS-MBR3045CT-1-M3	UNITS
Maximum DC reverse voltage	V _R	35	45	V
Maximum working peak reverse voltage	V _{RWM}			



ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current per leg per device	$I_{F(AV)}$	$T_C = 123\text{ }^\circ\text{C}$, rated V_R		15	A
				30	
Peak repetitive forward current per leg	I_{FRM}	Rated V_R , square wave, 20 kHz, $T_C = 123\text{ }^\circ\text{C}$		30	
Non-repetitive peak surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	1020	
		Surge applied at rated load conditions halfwave, single phase, 60 Hz		200	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25\text{ }^\circ\text{C}$, $I_{AS} = 2\text{ A}$, $L = 5\text{ mH}$		10	mJ
Repetitive avalanche current per leg	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		2	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	$V_{FM}^{(1)}$	30 A	$T_J = 25\text{ }^\circ\text{C}$	0.76	V
		20 A		$T_J = 125\text{ }^\circ\text{C}$	
		30 A			
Maximum instantaneous reverse current	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	Rated DC voltage	1	mA
		$T_J = 125\text{ }^\circ\text{C}$		100	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J$ maximum		0.29	V
Forward slope resistance	r_t			13.6	m Ω
Maximum junction capacitance	C_T	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$		800	pF
Typical series inductance	L_S	Measured from top of terminal to mounting plane		8.0	nH
Maximum voltage rate of change	dV/dt	Rated V_R		10 000	V/ μs

Note

(1) Pulse width < 300 μs , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction temperature range	T_J			-65 to 150	$^\circ\text{C}$
Maximum storage temperature range	T_{Stg}			-65 to 175	
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation		1.5	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased		0.50	
Maximum thermal resistance, junction to ambient	R_{thJA}	DC operation		50	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum		Non-lubricated threads	6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device		Case style D ² PAK		MBRB3035CT MBRB3045CT	
		Case style TO-262		MBR3035CT-1 MBR3045CT-1	

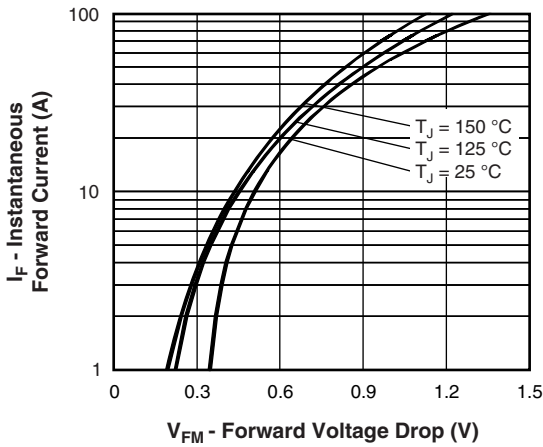


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

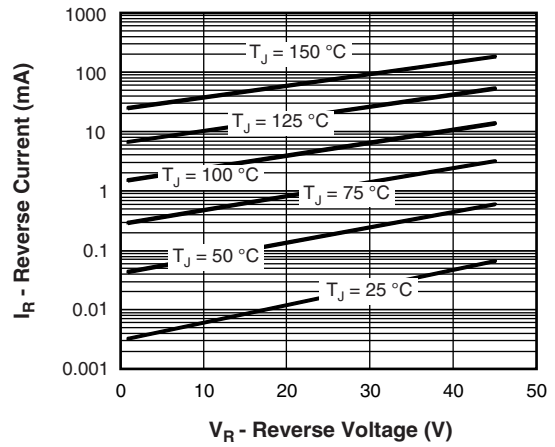


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

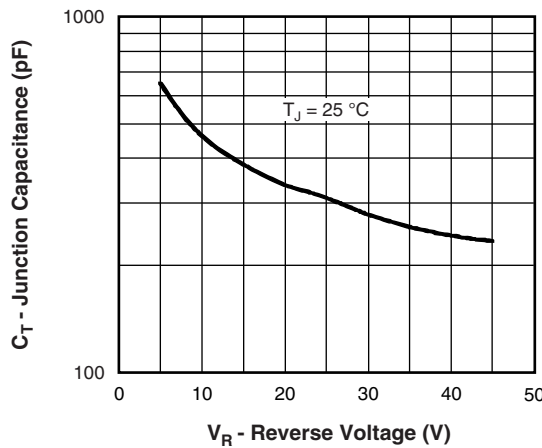


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

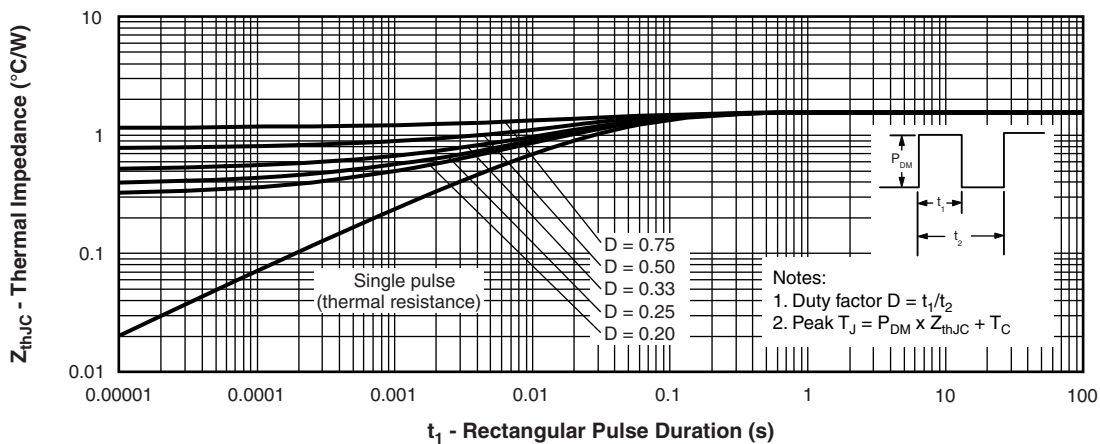


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

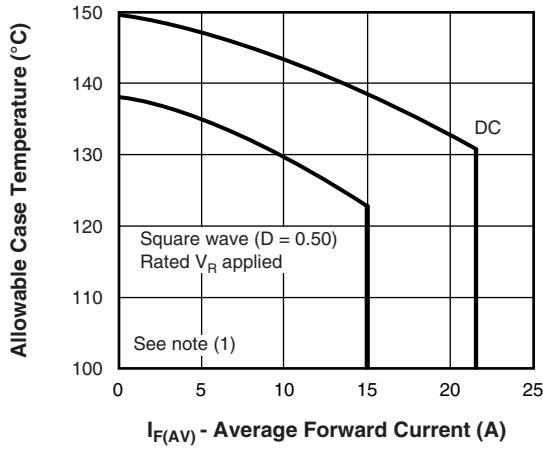


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

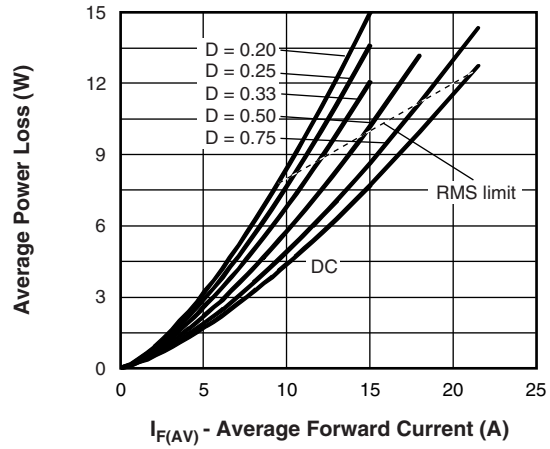


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

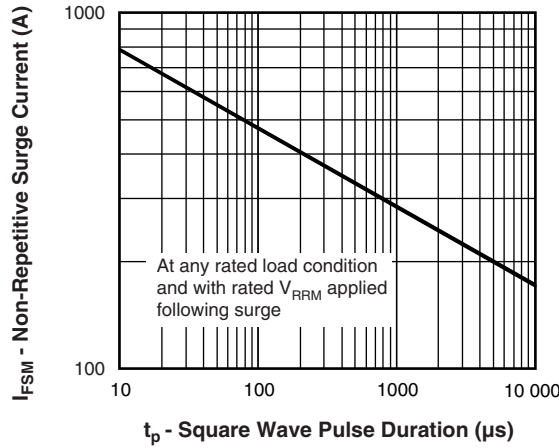


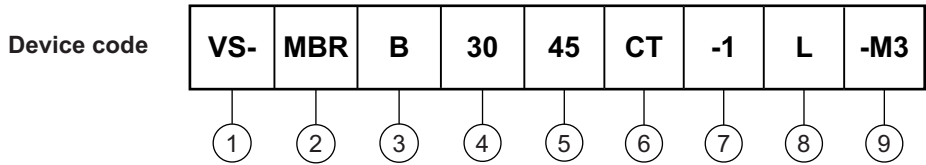
Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 P_d = forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{d_{REV}}$ = inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = rated V_R



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Essential part number
- 3** -
 - B = D²PAK **7** None
 - None = TO-262 **7** = -1
- 4** - Current rating (30 = 30 A)
- 5** - Voltage ratings 35 = 35 V
45 = 45 V
- 6** - CT = essential part number
- 7** -
 - None = D²PAK **3** = B
 - -1 = TO-262 **3** None
- 8** -
 - None = tube
 - L = tape and reel (left oriented - for D²PAK only)
 - R = tape and reel (right oriented - for D²PAK only)
- 9** - -M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

ORDERING INFORMATION (Example)		
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION
VS-MBRB3030CTLL-M3	800	13" diameter plastic tape and reel
VS-MBRB3030CTL-M3	800	13" diameter plastic tape and reel
VS-MBRB3030CTLR-M3	800	13" diameter plastic tape and reel
VS-MBRB3045CTL-M3	800	13" diameter plastic tape and reel
VS-MBRB3045CT-M3	50	Antistatic plastic tubes
VS-MBRB3045CTR-M3	800	13" diameter plastic tape and reel
VS-MBR3045CT-1-M3	50	Antistatic plastic tubes

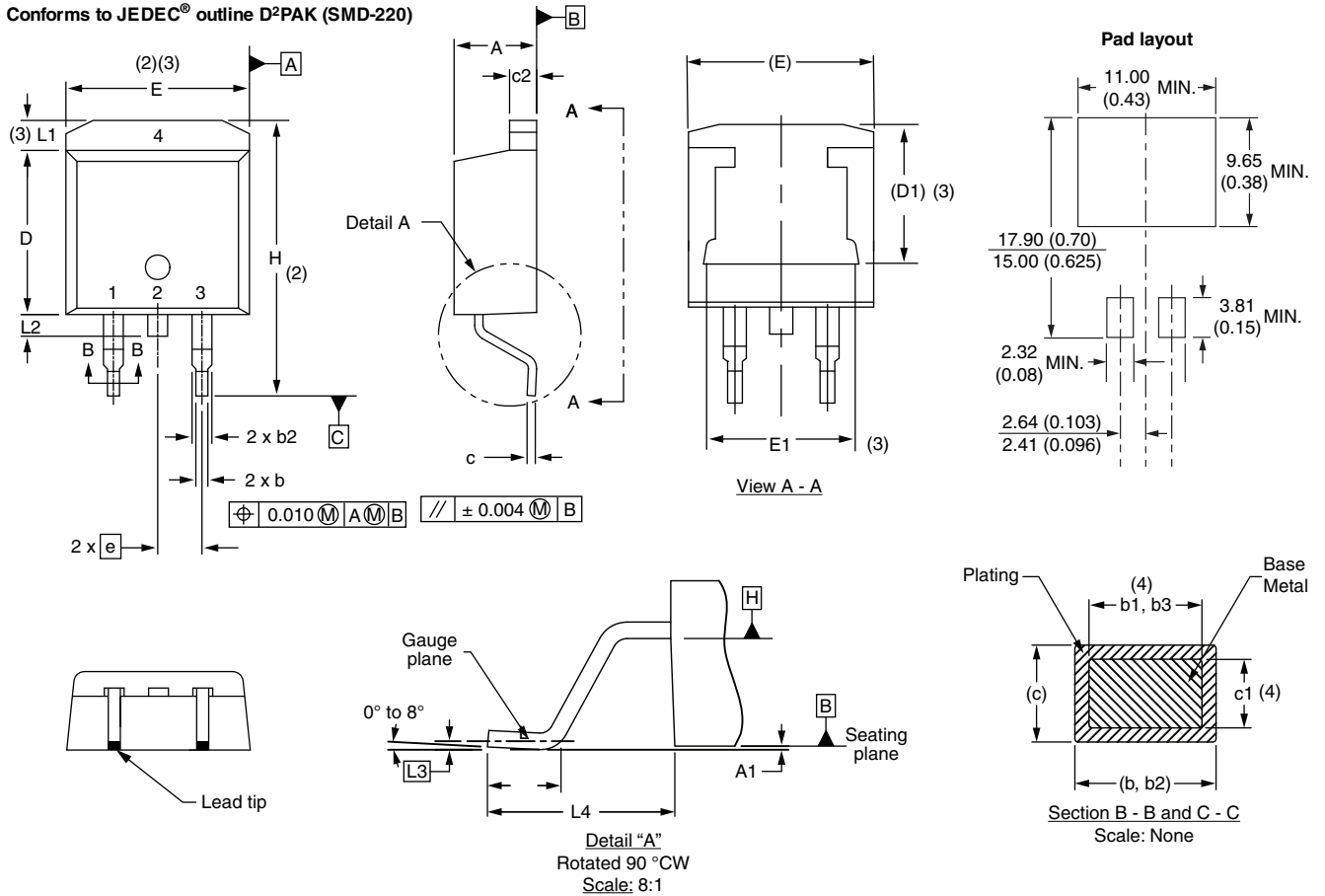
LINKS TO RELATED DOCUMENTS		
Dimensions	D ² PAK (TO-263AB)	www.vishay.com/doc?96164
Dimensions	TO-262AA	www.vishay.com/doc?96165
Part marking information	D ² PAK (TO-263AB)	www.vishay.com/doc?95444
Part marking information	TO-262AA	www.vishay.com/doc?95443
Packaging information		www.vishay.com/doc?96424



D²PAK

DIMENSIONS in millimeters and inches

Conforms to JEDEC® outline D²PAK (SMD-220)



SYMBOL	MILLIMETERS		INCHES		NOTES	SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.			MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190		D1	6.86	8.00	0.270	0.315	3
A1	0.00	0.254	0.000	0.010		E	9.65	10.67	0.380	0.420	2, 3
b	0.51	0.99	0.020	0.039		E1	7.90	8.80	0.311	0.346	3
b1	0.51	0.89	0.020	0.035	4	e	2.54 BSC		0.100 BSC		
b2	1.14	1.78	0.045	0.070		H	14.61	15.88	0.575	0.625	
b3	1.14	1.73	0.045	0.068	4	L	1.78	2.79	0.070	0.110	3
c	0.38	0.74	0.015	0.029		L1	-	1.65	-	0.066	
c1	0.38	0.58	0.015	0.023	4	L2	1.27	1.78	0.050	0.070	
c2	1.14	1.65	0.045	0.065		L3	0.25 BSC		0.010 BSC		
D	8.51	9.65	0.335	0.380	2	L4	4.78	5.28	0.188	0.208	

Notes

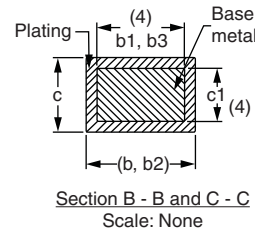
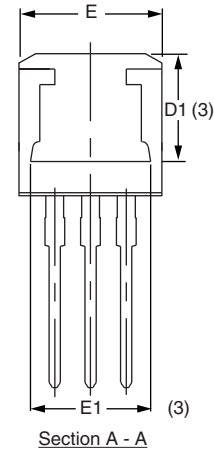
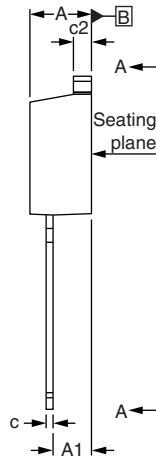
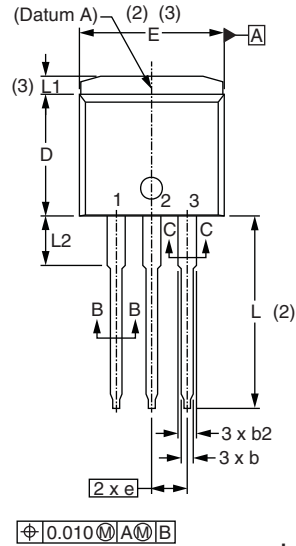
- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inches
- (7) Outline conforms to JEDEC® outline TO-263AB



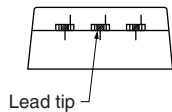
TO-262AA

DIMENSIONS in millimeters and inches

Modified JEDEC® outline TO-262



$\phi 0.010 \text{ (M)} \text{ (A)} \text{ (B)}$



Lead assignments

- Diodes**
 1. - Anode (two die)/open (one die)
 2., 4. - Cathode
 3. - Anode

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190	
A1	2.03	3.02	0.080	0.119	
b	0.51	0.99	0.020	0.039	
b1	0.51	0.89	0.020	0.035	4
b2	1.14	1.78	0.045	0.070	
b3	1.14	1.73	0.045	0.068	4
c	0.38	0.74	0.015	0.029	
c1	0.38	0.58	0.015	0.023	4
c2	1.14	1.65	0.045	0.065	
D	8.51	9.65	0.335	0.380	2
D1	6.86	8.00	0.270	0.315	3
E	9.65	10.67	0.380	0.420	2, 3
E1	7.90	8.80	0.311	0.346	3
e	2.54 BSC		0.100 BSC		
L	13.46	14.10	0.530	0.555	
L1	-	1.65	-	0.065	3
L2	3.56	3.71	0.140	0.146	

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Controlling dimension: inches
- (6) Outline conform to JEDEC® TO-262 except A1 (max.), b (min., max.), b1 (min.), b2 (max.), c (min.), c1 (min.), c2 (max.), D (min.), E (max.), L1 (max.), L2 (min., max.)



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