

Aluminum Capacitors +105 °C, Miniature, Radial Lead



QUICK REFERENCE DATA	
DESCRIPTION	VALUE
Nominal case size Ø D x L in inches [mm]	0.394 x 0.472 [10.0 x 12.0] to 0.709 x 1.575 [18.0 x 40.0]
Operating temperature	-55 °C to +105 °C
Rated capacitance range, C _R	4.7 µF to 3300 µF
Tolerance on C _R	-10 %, +50 %
Rated voltage range, U _R	6.3 WV _{DC} to 250 WV _{DC}
Termination	2 and 3 radial leads and axial mount.
Life validation test	4000 h at +105 °C (≥ 13.0 mm dia.); 3000 h at +105 °C (10.0 mm dia.); ΔCAP ≤ 20 % from initial measurement. ΔESR ≤ 1.15 x initial specified limit. ΔDCL ≤ initial specified limit.
Shelf life at 105 °C	500 h: ΔCAP ≤ 10 % from initial measurement. ΔESR ≤ 1.15 x initial specified limit. ΔDCL ≤ 2 x initial specified limit, (6.3 WV _{DC} to 100 WV _{DC}); ≤ 3 x initial specified limit, (150 WV _{DC} to 250 WV _{DC}).
DC leakage current (after 2 min charge)	$I = 0.03 \sqrt{CV}$ (6.3 V _{DC} to 100 V _{DC}) $I = 0.01 CV$ (150 V _{DC} to 250 V _{DC}) I in µA, C in µF, V in Volts

FEATURES

- Original SMPS output capacitors
- Minimal ESR change
- High ripple current capability
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

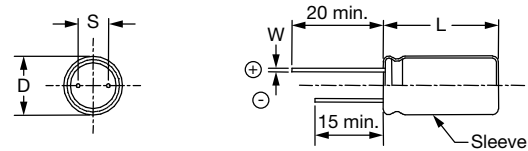


RIPPLE CURRENT MULTIPLIERS				
TEMPERATURE				
AMBIENT TEMPERATURE		MULTIPLIERS		
+105 °C		0.5		
+85 °C		1.0		
≤ +75 °C		1.25		
FREQUENCY (Hz)				
WV _{DC}	50 TO 60	100 TO 120	300 TO 400	1K TO 19K
0 to 75	0.60	0.70	0.75	0.80
76 to 100	0.40	0.55	0.70	0.80
101 to 250	0.25	0.35	0.45	0.65

LOW TEMPERATURE PERFORMANCE				
CAPACITANCE RATIO C ^{-55 °C} / C ^{+25 °C} MINIMUM AT 120 Hz				
MAXIMUM CAPACITANCE CHANGE	VOLTAGE	MULTIPLIER		
	6.3 V to 100 V	0.75		
150 V to 250 V	0.70			
MAXIMUM IMPEDANCE CHANGE	VOLTAGE	MULTIPLIER		
	6.3 V to 100 V	2.5		
150 V to 250 V	2.0			
ESL (TYPICAL VALUES AT 1 MHz TO 10 MHz)				
NOMINAL DIAMETER	0.394 [10.0]	0.512 [13.0]	0.630 [16.0]	0.709 [18.0]
TYPICAL ESL (nH)	4.0	7.0	10.0	12.0

BULK SPECIFICATIONS in millimeters

TERMINAL CODE C

TERMINAL CODE D

TERMINAL CODE J ⁽¹⁾

TERMINAL CODE O ⁽²⁾

Notes

- ⊕ Positive terminal
- ⊖ Negative terminal
- Ⓝ No charge potential

⁽¹⁾ Available for 12.5 mm, 16 mm, and 18 mm diameter units

⁽²⁾ Available for 12.5 mm, 16 mm, and 18 mm diameter units with epoxy end-seal

DIMENSIONS in inches [millimeters]										
CASE CODE	NOMINAL		STYLES 2 AND 4		STYLES 3 AND 5		LEAD SPACING		LEAD DIAMETER	
	D	L	D (max.)	L (max.)	D (max.)	L (max.)	S ± 0.024 [0.60]	T ± 0.020 [0.50]	NOMINAL	AWG
CC	0.394 [10.0]	0.512 [13.0]	0.413 [10.5]	0.563 [14.3]	0.413 [10.5]	0.630 [16.0]	0.197 [5.0]	n/a	0.025 [0.63]	22
CD	0.394 [10.0]	0.630 [16.0]	0.413 [10.5]	0.669 [17.0]	0.413 [10.5]	0.740 [18.8]	0.197 [5.0]	n/a	0.025 [0.63]	22
CG	0.394 [10.0]	0.787 [20.0]	0.413 [10.5]	0.846 [21.5]	0.413 [10.5]	0.906 [23.0]	0.197 [5.0]	n/a	0.025 [0.63]	22
DG	0.492 [12.5]	0.787 [20.0]	0.512 [13.0]	0.846 [21.5]	0.512 [13.0]	0.906 [23.0]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
DK	0.492 [12.5]	0.984 [25.0]	0.512 [13.0]	1.043 [26.5]	0.512 [13.0]	1.142 [29.0]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
DM	0.492 [12.5]	1.043 [26.5]	0.512 [13.0]	1.102 [28.0]	0.512 [13.0]	1.161 [29.5]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
DT	0.492 [12.5]	1.319 [33.5]	0.512 [13.0]	1.346 [34.2]	0.512 [13.0]	1.417 [36.0]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
DS	0.492 [12.5]	1.673 [42.5]	0.512 [13.0]	1.720 [43.7]	0.512 [13.0]	1.791 [45.5]	0.197 [5.0]	0.098 [2.5]	0.032 [0.81]	20
EK	0.630 [16.0]	0.984 [25.0]	0.650 [16.5]	1.031 [26.2]	0.650 [16.5]	1.098 [27.9]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
EN	0.630 [16.0]	1.260 [32.0]	0.650 [16.5]	1.319 [33.5]	0.650 [16.5]	1.417 [36.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
ER	0.630 [16.0]	1.417 [36.0]	0.650 [16.5]	1.476 [37.5]	0.650 [16.5]	1.575 [40.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
ET	0.630 [16.0]	1.319 [33.5]	0.650 [16.5]	1.347 [34.2]	0.650 [16.5]	1.417 [36.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
EU	0.630 [16.0]	1.575 [40.0]	0.650 [16.5]	1.642 [41.7]	0.650 [16.5]	1.669 [42.4]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
FR	0.709 [18.0]	1.417 [36.0]	0.728 [18.5]	1.476 [37.5]	0.728 [18.5]	1.575 [40.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20
FV	0.709 [18.0]	1.575 [40.0]	0.728 [18.5]	1.653 [42.0]	0.728 [18.5]	1.693 [43.0]	0.295 [7.5]	0.150 [3.8]	0.032 [0.81]	20

TAPE AND REEL, SPECIFICATIONS TO EIA-468D in inches [millimeters]

Formed Leads


DIMENSIONS in inches [millimeters] AND PACKAGING QUANTITIES		
CASE SIZE	F LEAD SPACING	STD. QTY/REEL
0.236 x 0.453 [6.0 x 11.0]	0.197 [5.0]	800
0.315 x 0.472 [8.0 x 12.0]	0.197 [5.0]	700

Unformed (Straight) Leads


DIMENSIONS in inches [millimeters] AND PACKAGING QUANTITIES		
CASE SIZE	F LEAD SPACING	STD. QTY/REEL
0.236 x 0.453 [6.0 x 11.0]	0.098 [2.5]	800
0.315 x 0.472 [8.0 x 12.0]	0.140 [3.5] ⁽¹⁾	700
0.394 x 0.512 [10.0 x 13.0]	0.197 [5.0]	500
0.394 x 0.630 [10.0 x 16.0]	0.197 [5.0]	500
0.394 x 0.787 [10.0 x 20.0]	0.197 [5.0]	500

Note
⁽¹⁾ Available as special order.



DIMENSIONS in inches [millimeters]					
ITEM	CASE SIZE (DIAMETER x LENGTH)				
	0.236 x 0.433 [6.0 x 11.0]	0.315 x 0.472 [8.0 x 12.0]	0.394 x 0.512 [10.0 x 13.0]	0.394 x 0.630 [10.0 x 16.0]	0.394 x 0.787 [10.0 x 20.0]
d - Lead-wire diameter	0.025 [0.63]	0.025 [0.63]	0.025 [0.63]	0.025 [0.63]	0.025 [0.63]
P - Pitch of component	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]
P ₀ - Feed hole pitch	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]	0.500 [12.7]
F - Lead-to-lead distance	0.197 [5.0]	0.197 [5.0]	0.197 [5.0]	0.197 [5.0]	0.197 [5.0]
K - Clinch height	0.098 [2.5]	0.157 [4.0]	n/a	n/a	n/a
H - Height of component from tape center	0.728 [18.5]	0.787 [20.0]	0.906 [23.0]	0.906 [23.0]	0.906 [23.0]
H ₀ - Lead-wire clinch height	0.630 [16.0]	0.630 [16.0]	n/a	n/a	n/a
W - Tape width	0.709 [18.0]	0.709 [18.0]	0.709 [18.0]	0.709 [18.0]	0.709 [18.0]
W ₀ - Hold down tape width	0.591 [15.0]	0.591 [15.0]	0.591 [15.0]	0.591 [15.0]	0.591 [15.0]
D ₀ - Feed hole diameter	0.157 [4.0]	0.157 [4.0]	0.157 [4.0]	0.157 [4.0]	0.157 [4.0]
f - Total tape thickness	0.028 [0.7]	0.028 [0.7]	0.028 [0.7]	0.028 [0.7]	0.028 [0.7]
L ₁ - Maximum lead protrusion	0.118 [3.0]	0.118 [3.0]	0.118 [3.0]	0.118 [3.0]	0.118 [3.0]

Note

- Positive leader is standard. Negative leader is available by special order.

ORDERING EXAMPLE

Electrolytic capacitor 672D series: 672D 336 F 100 DM 5 D

DESCRIPTION	
CODE	EXPLANATION
672D	Product type
336	Capacitance value (33 μF)
F	Tolerance (F = -10 % / +50 %)
100	Voltage rating at 105 °C (100 = 100 V)
DM	Can size (see Dimensions table)
5	Sleeve and sealing (5 = polyester sleeve w/epoxy end seal)
D	Terminal code / packaging (D = bulk; straight leads)

Note

- For lead (Pb)-free / RoHS compliant products add suffix "E3" to part number.
Example: 672D336F100DM5DE3

ELECTRICAL DATA AND ORDERING INFORMATION						
CAPACITANCE (μF)	PART NUMBER	NOMINAL CASE SIZE D x L	MAX. ESR AT +25 °C (Ω)		MAX. RIPPLE AT +85 °C (A) 20 kHz TO 100 kHz	MAX. IMPEDANCE AT +25 °C (Ω) 100 kHz
			120 Hz	20 kHz		
6.3 WV_{DC} AT 105 °C, SURGE = 9 V						
150.0	672D157F6RCD5D	0.394 x 0.630 [10.0 x 16.0]	1.10	0.70	0.50	0.60
220.0	672D227F6RCG5D	0.394 x 0.787 [10.0 x 20.0]	0.75	0.40	0.70	0.33
1000.0	672D108F6REK5D	0.630 x 0.984 [16.0 x 25.0]	0.16	0.09	2.05	0.085
1500.0	672D158F6RET5D	0.630 x 1.319 [16.0 x 33.5]	0.105	0.06	2.90	0.055
3300.0	672D338F6RFV5D	0.709 x 1.575 [18.0 x 40.0]	0.075	0.045	3.40	0.045
12 WV_{DC} AT 105 °C, SURGE = 16 V						
100.0	672D107F012CC5D	0.394 x 0.512 [10.0 x 13.0]	1.60	0.90	0.40	0.70
470.0	672D477F012DM5D	0.492 x 1.043 [12.5 x 26.5]	0.31	0.16	1.35	0.12
1000.0	672D108F012DS5D	0.492 x 1.673 [12.5 x 42.5]	0.15	0.08	2.35	0.06
2200.0	672D228F012FV5D	0.709 x 1.575 [18.0 x 40.0]	0.08	0.05	3.30	0.05
15 WV_{DC} AT 105 °C, SURGE = 20 V						
100.0	672D107F015CD5D	0.394 x 0.630 [10.0 x 16.0]	1.35	0.70	0.50	0.50
470.0	672D477F015DT5D	0.492 x 1.319 [12.5 x 35.5]	0.25	0.12	1.75	0.11
1000.0	672D108F015ET5D	0.630 x 1.319 [16.0 x 33.5]	0.12	0.06	2.90	0.055
20 WV_{DC} AT 105 °C, SURGE = 30 V						
100.0	672D107F020CG5D	0.394 x 0.787 [10.0 x 20.0]	1.25	0.40	0.70	0.35
470.0	672D477F020EK5D	0.630 x 0.984 [16.0 x 25.0]	0.24	0.09	2.00	0.085
1000.0	672D158F020FV5D	0.709 x 1.575 [18.0 x 40.0]	0.09	0.05	3.25	0.05



ELECTRICAL DATA AND ORDERING INFORMATION						
CAPACITANCE (μF)	PART NUMBER	NOMINAL CASE SIZE D x L	MAX. ESR AT +25 °C (Ω)		MAX. RIPPLE AT +85 °C (A) 20 kHz TO 100 kHz	MAX. IMPEDANCE AT +25 °C (Ω) 100 kHz
			120 Hz	20 kHz		
25 WV_{DC} AT 105 °C, SURGE = 35 V						
47.0	672D476F025CC5D	0.394 x 0.512 [10.0 x 13.0]	2.35	0.90	0.40	0.85
330.0	672D337F025DT5D	0.492 x 1.319 [12.5 x 33.5]	0.29	0.12	1.75	0.10
470.0	672D477F025DS5D	0.492 x 1.673 [12.5 x 42.5]	0.22	0.08	2.35	0.07
1200.0	672D128F025FV5D	0.709 x 1.575 [18.0 x 40.0]	0.10	0.05	3.20	0.055
40 WV_{DC} AT 105 °C, SURGE = 55 V						
220.0	672D227F040EK5D	0.630 x 0.984 [16.0 x 25.0]	0.48	0.14	1.65	0.12
330.0	672D337F040ET5D	0.630 x 1.319 [16.0 x 33.5]	0.32	0.12	2.25	0.08
50 WV_{DC} AT 105 °C, SURGE = 75 V						
100.0	672D107F050DT5D	0.492 x 1.319 [12.5 x 33.5]	0.80	0.26	1.15	0.22
150.0	672D157F050EK5D	0.630 x 0.984 [16.0 x 25.0]	0.55	0.22	1.30	0.18
220.0	672D227F050ET5D	0.630 x 1.319 [16.0 x 33.5]	0.40	0.15	1.85	0.12
470.0	672D477F050FV5D	0.709 x 1.575 [18.0 x 40.0]	0.25	0.09	2.40	0.095
60 WV_{DC} AT 105 °C, SURGE = 85 V						
15.0	672D156F060CD5D	0.394 x 0.512 [10.0 x 13.0]	7.00	2.00	0.28	1.70
22.0	672D226F060CG5D	0.394 x 0.787 [10.0 x 20.0]	4.60	1.20	0.40	1.00
100.0	672D107F060EK5D	0.630 x 0.984 [16.0 x 25.0]	0.90	0.28	1.20	0.24
150.0	672D157F060ET5D	0.630 x 1.319 [16.0 x 33.5]	0.60	0.18	1.65	0.15
75 WV_{DC} AT 105 °C, SURGE = 100 V						
12.0	672D126F075CD5D	0.394 x 0.512 [10.0 x 13.0]	8.50	2.20	0.26	1.75
120.0	672D127F075ET5D	0.630 x 1.319 [16.0 x 33.5]	0.68	0.18	1.50	0.16
100 WV_{DC} AT 105 °C, SURGE = 125 V						
10.0	672D106F100CD5D	0.394 x 0.630 [10.0 x 16.0]	10.00	2.30	0.26	1.80
33.0	672D336F100DM5D	0.492 x 1.043 [12.5 x 26.5]	2.55	0.55	0.72	0.39
120.0	672D127F100ET5D	0.630 x 1.319 [16.0 x 33.5]	0.68	0.19	1.50	0.17
200 WV_{DC} AT 105 °C, SURGE = 250 V						
4.7	672D475F200CG5D	0.394 x 0.787 [10.0 x 20.0]	22.50	1.95	0.31	1.75
15.0	672D156F200DT5D	0.492 x 1.319 [12.5 x 33.5]	7.00	0.58	0.76	0.55
47.0	672D476F200FV5D	0.709 x 1.575 [18.0 x 40.0]	2.30	0.18	1.90	0.165
250 WV_{DC} AT 105 °C, SURGE = 300 V						
10.0	672D106F250DT5D	0.492 x 1.319 [12.5 x 33.5]	12.00	1.50	0.48	1.60

ELECTRICAL DATA AND ORDERING INFORMATION - Original ratings		
CAPACITANCE (μF)	CASE CODE	PART NUMBER
6.3 WV_{DC} AT 105 °C, SURGE = 9 V		
150.0	CD	672D157H6R3CD5C
220.0	CG	672D227H6R3CG5C
680.0	DM	672D687H6R3DM5C
1000.0	EK	672D108H6R3EK5C
1200.0	DS	672D158H6R3ET5C
3300.0	FV	672D338H6R3FV5C
7.5 WV_{DC} AT 105 °C, SURGE = 10 V		
100.0	CC	672D107H7R5CC5C
150.0	CD	672D157H7R5CD5C
680.0	DT	672D687H7R5DT5C
1000.0	ET	672D108H7R5ET5C
2700.0	FV	672D278H7R5FV5C

Note

- Capacitance tolerance code H, -10 %, +100 %; lead code C, cut leads. C lead = negative lead: 0.281" [7.1 mm], ± 0.062" [1.6 mm]; positive lead: 0.375" [9.5 mm], ± 0.062" [1.6 mm]. D lead = 1.0" [25.4 mm] minimum.



ELECTRICAL DATA AND ORDERING INFORMATION - Original ratings		
CAPACITANCE (μF)	CASE CODE	PART NUMBER
12 WV_{DC} AT 105 °C, SURGE = 16 V		
100.0	CC	672D107H012CC5C
150.0	CG	672D157H012CG5C
470.0	DM	672D477H012DM5C
680.0	DT	672D687H012DT5C
1000.0	DS	672D108H012DS5C
2200.0	FV	672D228H012FV5C
15 WV_{DC} AT 105 °C, SURGE = 20 V		
100.0	CD	672D107H015CD5C
150.0	CG	672D157H015CG5C
470.0	DT	672D477H015DT5C
680.0	EK	672D687H015EK5C
820.0	DS	672D827H015DS5C
1000.0	ET	672D108H015ET5C
1800.0	FV	672D188H015FV5C
20 WV_{DC} AT 105 °C, SURGE = 30 V		
68.0	CD	672D868H020CD5C
100.0	CG	672D107H020CG5C
330.0	DM	672D337H020DM5C
470.0	EK	672D477H020EK5C
560.0	DS	672D567H020DS5C
680.0	ET	672D687H020ET5C
1500.0	FV	672D158H020FV5C
25 WV_{DC} AT 105 °C, SURGE = 35 V		
47.0	CC	672D476H025CC5C
68.0	CD	672D686H025CD5C
330.0	DT	672D337H025DT5C
470.0	DS	672D477H025DS5C
680.0	EU	672D687H025EU5C
1200.0	FV	672D128H025FV5C
40 WV_{DC} AT 105 °C, SURGE = 55 V		
47.0	CD	672D476H040CD5C
220.0	EK	672D227H040EK5C
330.0	ET	672D337H040ET5C
390.0	DS	672D397H040DS5C
820.0	FV	672D827H040FV5C
50 WV_{DC} AT 105 °C, SURGE = 75 V		
22.0	CD	672D226H050CD5C
100.0	DT	672D107H050DT5C
150.0	EK	672D157H050EK5C
180.0	DS	672D187H050DS5C
220.0	ET	672D227H050ET5C
470.0	FV	672D477H050FV5C
60 WV_{DC} AT 105 °C, SURGE = 85 V		
15.0	CD	672D156H060CD5C
22.0	CG	672D226H060CG5C
68.0	DM	672D686H060DM5C
100.0	EK	672D107H060EK5C
120.0	DS	672D127H060DS5C
150.0	ET	672D157H060ET5C
390.0	FV	672D397H060FV5C

Note

- Capacitance tolerance code H, -10 %, +100 %; lead code C, cut leads. C lead = negative lead: 0.281" [7.1 mm], \pm 0.062" [1.6 mm]; positive lead: 0.375" [9.5 mm], \pm 0.062" [1.6 mm]. D lead = 1.0" [25.4 mm] minimum.



ELECTRICAL DATA AND ORDERING INFORMATION - Original ratings		
CAPACITANCE (µF)	CASE CODE	PART NUMBER
75 WV_{DC} AT 105 °C, SURGE = 100 V		
12.0	CD	672D126H075CD5C
18.0	CG	672D186H075CG5C
82.0	EK	672D826H075EK5C
120.0	ET	672D127H075ET5C
270.0	FV	672D277H075FV5C
100 WV_{DC} AT 105 °C, SURGE = 125 V		
8.2	CC	672D825H100CC5C
10.0	CD	672D106H100CD5C
33.0	DM	672D336H100DM5C
68.0	EK	672D686H100EK5C
120.0	ET	672D127H100ET5C
180.0	FV	672D187H100FV5C
150 WV_{DC} AT 105 °C, SURGE = 200 V		
6.8	CG	672D685H150CG5C
22.0	DT	672D226H150DT5C
39.0	ET	672D396H150ET5C
68.0	FV	672D686H150FV5C
200 WV_{DC} AT 105 °C, SURGE = 250 V		
4.7	CG	672D475H200CG5C
15.0	DT	672D156H200DT5C
27.0	ET	672D276H200ET5C
47.0	FV	672D476H200FV5C
250 WV_{DC} AT 105 °C, SURGE = 300 V		
8.2	DM	672D825H250DM5C
10.0	DT	672D106H250DT5C
22.0	ET	672D226H250ET5C
39.0	FV	672D396H250FV5C

Note

- Capacitance tolerance code H, -10 %, +100 %; lead code C, cut leads. C lead = negative lead: 0.281" [7.1 mm], ± 0.062" [1.6 mm]; positive lead: 0.375" [9.5 mm], ± 0.062" [1.6 mm]. D lead = 1.0" [25.4 mm] minimum.

Statements about product lifetime are based on calculations and internal testing. They should only be interpreted as estimations. Also due to external factors, the lifetime in the field application may deviate from the calculated lifetime. In general, nothing stated herein shall be construed as a guarantee of durability.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.