

MBR40250, MBR40250T, MBRF40250T, MBRB40250T

250 V, 40 A SWITCHMODE™ Schottky Power Rectifier

Features

- 250 V Blocking Voltage
- Low Forward Voltage Drop, $V_F = 0.86$ V
- Soft Recovery Characteristic, $T_{RR} < 35$ ns
- Stable Switching Performance Over Temperature
- These are Pb-Free Devices*

Benefits

- Reduces or Eliminates Reverse Recovery Oscillations
- Minimizes Need for EMI Filtering
- Reduces Switching Losses
- Improved Efficiency

Applications

- Power Supply
- Power Management
- Automotive
- Instrumentation

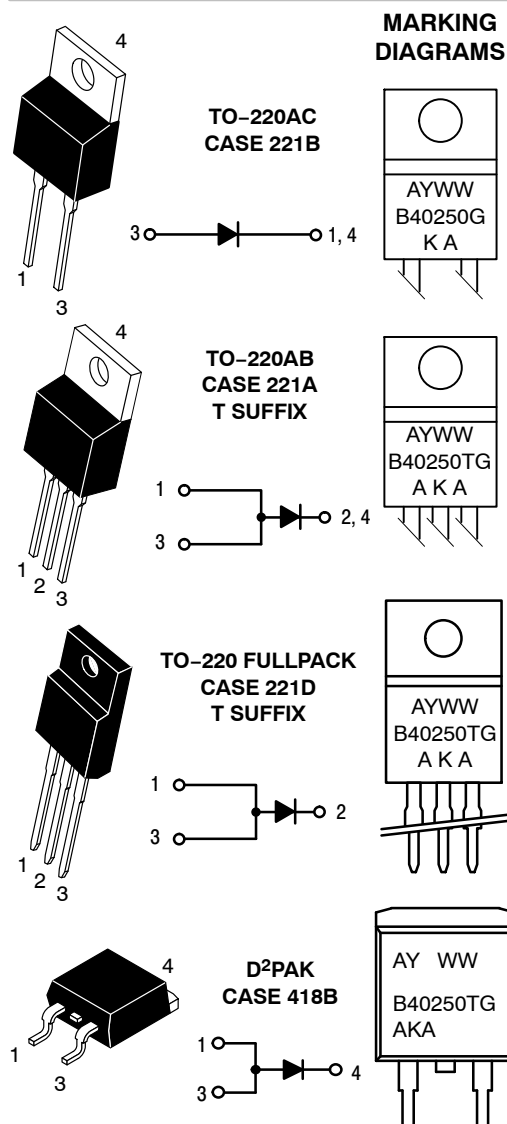
Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 1.9 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes:
260°C Max. for 10 Seconds
- Epoxy Meets UL 94 V-0 at 0.125 in



ON Semiconductor®

<http://onsemi.com>



B40250 = Device Code
T = 3 pins
A = Assembly Location
Y = Year
WW = Work Week
G = Pb-Free Package
KA, AKA = Polarity Designator

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

MBR40250, MBR40250T, MBRF40250T, MBRB40250T

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	250	V
Average Rectified Forward Current (Rated V_R) $T_C = 82^\circ\text{C}$ MBR40250, MBR40250T, MBRB40250T (Rated V_R) $T_C = 46^\circ\text{C}$ MBRF40250T	$I_{F(AV)}$	40	A
Peak Repetitive Forward Current (Rated V_R , Square Wave, 20 kHz) $T_C = 82^\circ\text{C}$ MBR40250, MBR40250T, MBRB40250T (Rated V_R , Square Wave, 20 kHz) $T_C = 46^\circ\text{C}$ MBRF40250T	I_{FRM}	80	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	150	A
Storage Temperature	T_{stg}	- 65 to +175	$^\circ\text{C}$
Operating Junction Temperature	T_J	- 65 to +150	$^\circ\text{C}$
Voltage Rate of Change (Rated V_R)	dv/dt	10,000	V/ μs

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Maximum Thermal Resistance Junction-to-Case MBR40250(T) and MBRB40250T	$R_{\theta JC}$	2.0	$^\circ\text{C/W}$
MBRF40250		3.0	
Junction-to-Ambient MBR40250(T)	$R_{\theta JA}$	60	
MBRF40250		50	
MBRB40250T		50	

ELECTRICAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 1) $I_F = 20\text{ A}$, $T_C = 25^\circ\text{C}$ $I_F = 20\text{ A}$, $T_C = 125^\circ\text{C}$ $I_F = 40\text{ A}$, $T_C = 25^\circ\text{C}$ $I_F = 40\text{ A}$, $T_C = 125^\circ\text{C}$	V_F	0.86 0.71 0.97 0.86	V
Maximum Instantaneous Reverse Current (Note 1) Rated DC Voltage, $T_C = 25^\circ\text{C}$ Rated DC Voltage, $T_C = 125^\circ\text{C}$	I_R	0.25 30	mA
Maximum Reverse Recovery Time $I_F = 1.0\text{ A}$, $di/dt = 50\text{ A}/\mu\text{s}$, $T_C = 25^\circ\text{C}$	t_{rr}	35	ns

DYNAMIC CHARACTERISTICS

Capacitance $V_R = -5.0\text{ V}$, $T_C = 25^\circ\text{C}$, Frequency = 1.0 MHz	C_T	500	pF
---	-------	-----	----

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

MBR40250, MBR40250T, MBRF40250T, MBRB40250T

TYPICAL CHARACTERISTICS

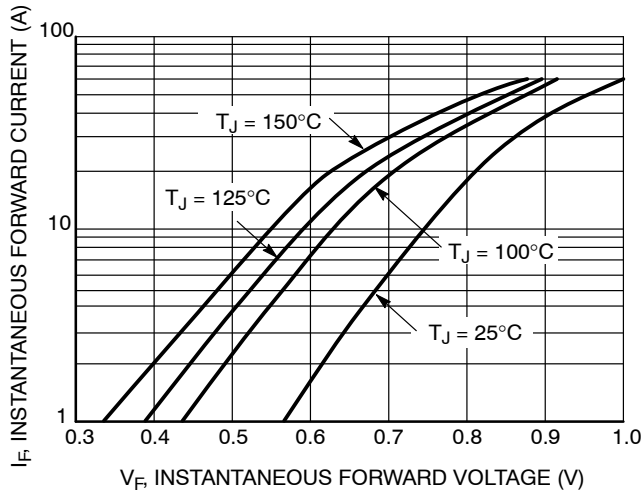


Figure 1. Typical Forward Voltage

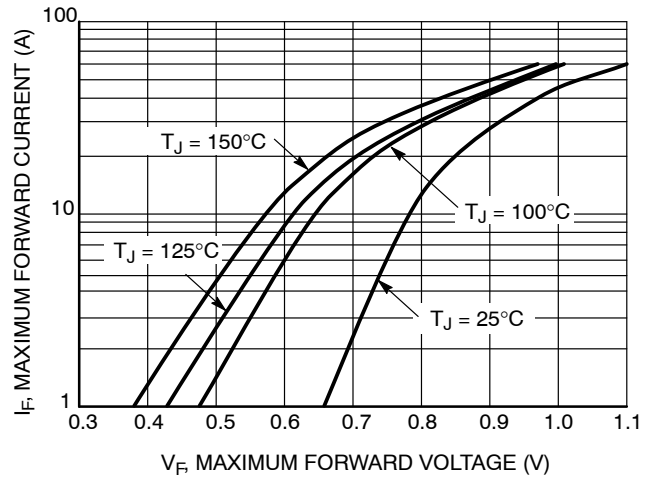


Figure 2. Maximum Forward Voltage

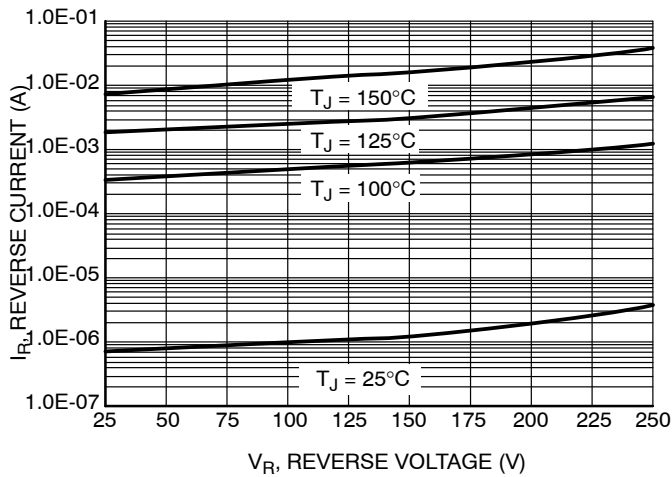


Figure 3. Typical Reverse Current

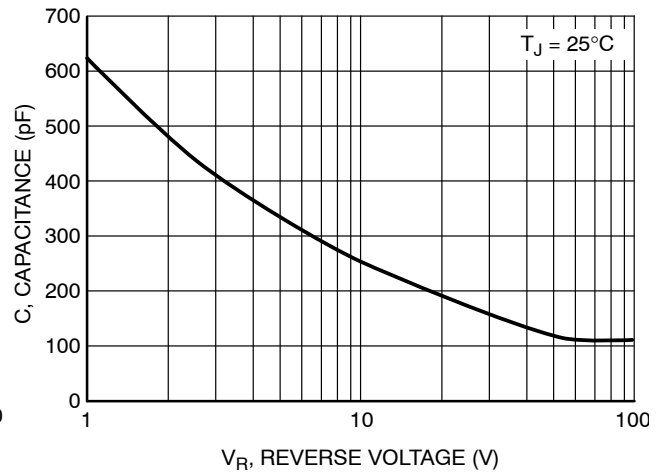


Figure 4. Typical Capacitance

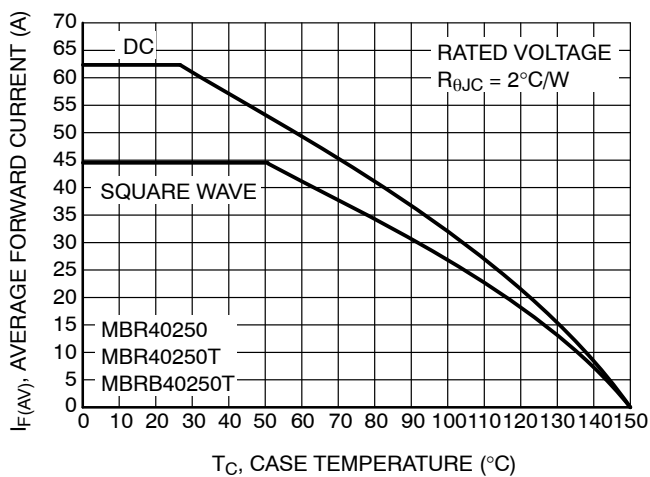


Figure 5. Current Derating (Case) for MBR40250, MBR40250T and MBRB40250T

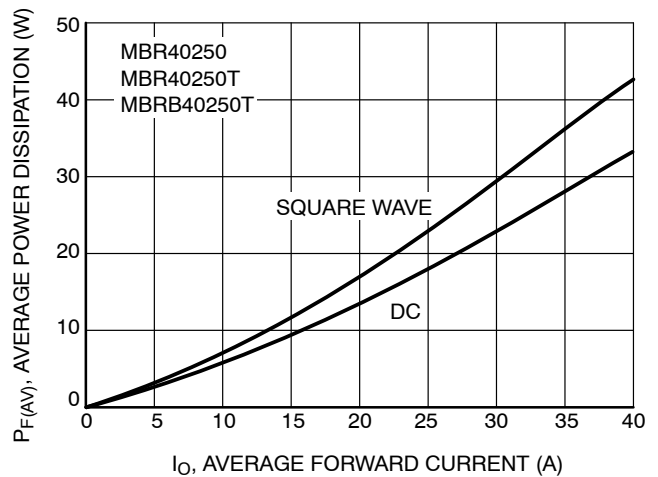


Figure 6. Forward Power Dissipation for MBR40250, MBR40250T and MBRB40250T

MBR40250, MBR40250T, MBRF40250T, MBRB40250T

TYPICAL CHARACTERISTICS

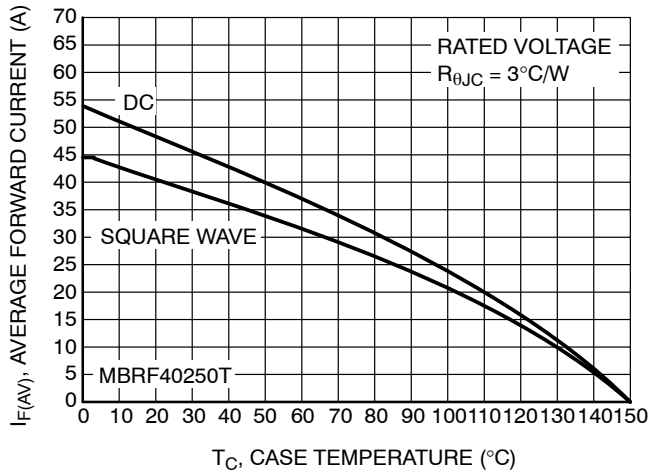


Figure 7. Current Derating (Case) for MBRF40250T

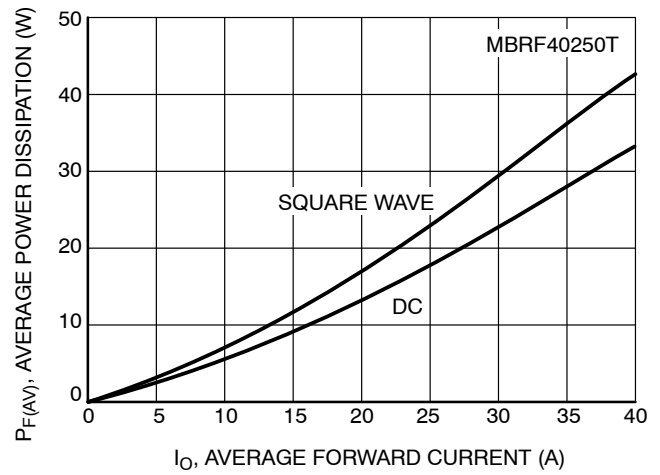


Figure 8. Forward Power Dissipation for MBRF40250T

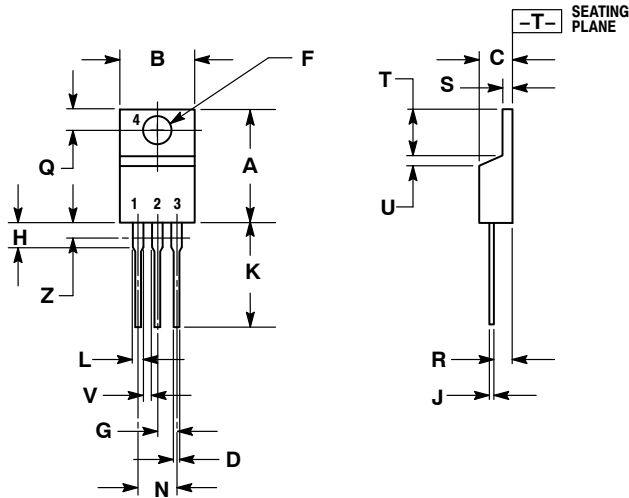
ORDERING INFORMATION

Device	Package	Shipping [†]
MBR40250G	TO-220AC (Pb-Free)	50 Units / Rail
MBR40250TG	TO-220AB (Pb-Free)	50 Units / Rail
MBRF40250TG	TO-220 FULLPACK (Pb-Free)	50 Units / Rail
MBRB40250TG	D ² PAK (Pb-Free)	50 Units / Rail
MBRB40250TT4G	D ² PAK (Pb-Free)	800 Units / Tape & Reel

MBR40250, MBR40250T, MBRF40250T, MBRB40250T

PACKAGE DIMENSIONS

TO-220 CASE 221A-09 ISSUE AF

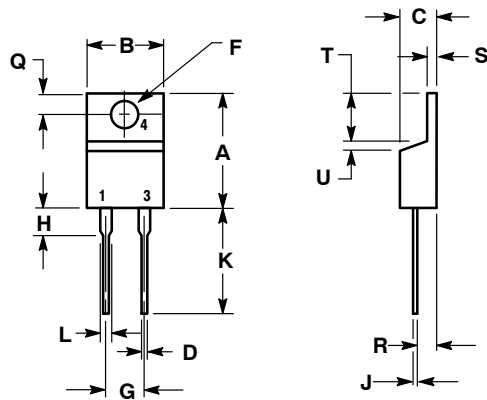


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.014	0.025	0.36	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

- STYLE 6:
1. ANODE
 2. CATHODE
 3. ANODE
 4. CATHODE

TO-220AC CASE 221B-04 ISSUE E



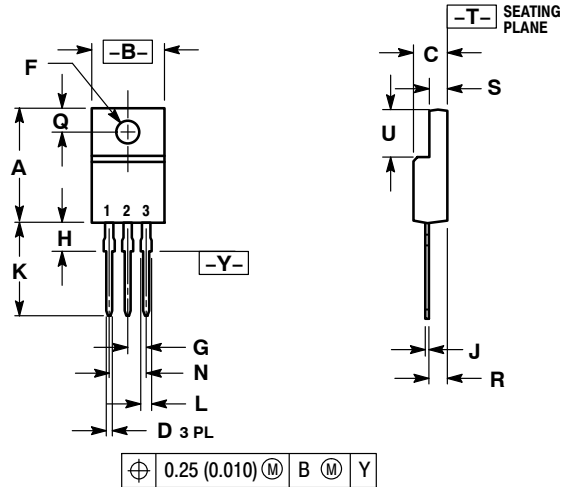
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.595	0.620	15.11	15.75
B	0.380	0.405	9.66	10.29
C	0.160	0.190	4.06	4.82
D	0.025	0.035	0.64	0.89
F	0.142	0.161	3.61	4.09
G	0.190	0.210	4.83	5.33
H	0.110	0.130	2.79	3.30
J	0.014	0.025	0.36	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.14	1.39
T	0.235	0.255	5.97	6.48
U	0.000	0.050	0.000	1.27

MBR40250, MBR40250T, MBRF40250T, MBRB40250T

PACKAGE DIMENSIONS

TO-220 FULLPAK CASE 221D-03 ISSUE J



NOTES:

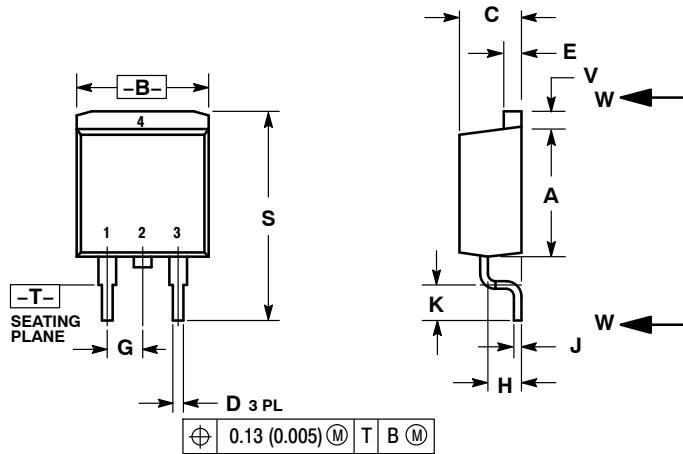
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH
3. 221D-01 THRU 221D-02 OBSOLETE, NEW STANDARD 221D-03.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.617	0.635	15.67	16.12
B	0.392	0.419	9.96	10.63
C	0.177	0.193	4.50	4.90
D	0.024	0.039	0.60	1.00
F	0.116	0.129	2.95	3.28
G	0.100 BSC		2.54 BSC	
H	0.118	0.135	3.00	3.43
J	0.018	0.025	0.45	0.63
K	0.503	0.541	12.78	13.73
L	0.048	0.058	1.23	1.47
N	0.200 BSC		5.08 BSC	
Q	0.122	0.138	3.10	3.50
R	0.099	0.117	2.51	2.96
S	0.092	0.113	2.34	2.87
U	0.239	0.271	6.06	6.88

MBR40250, MBR40250T, MBRF40250T, MBRB40250T

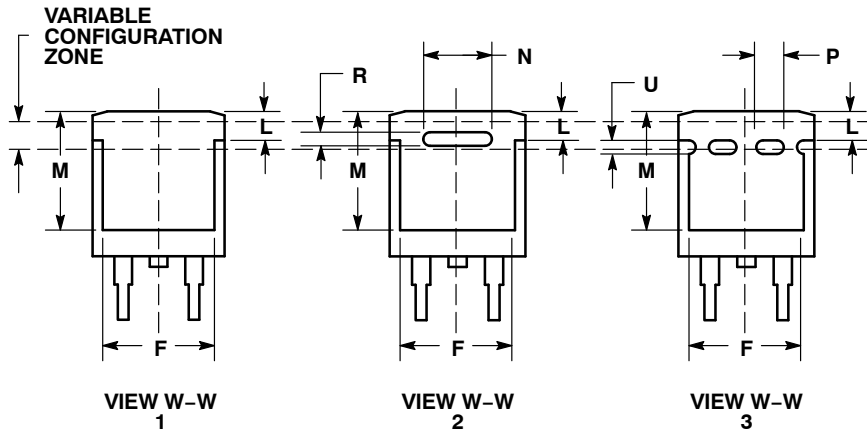
PACKAGE DIMENSIONS

D²PAK 3
CASE 418B-04
ISSUE K



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.340	0.380	8.64	9.65
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
E	0.045	0.055	1.14	1.40
F	0.310	0.350	7.87	8.89
G	0.100 BSC		2.54 BSC	
H	0.080	0.110	2.03	2.79
J	0.018	0.025	0.46	0.64
K	0.090	0.110	2.29	2.79
L	0.052	0.072	1.32	1.83
M	0.280	0.320	7.11	8.13
N	0.197 REF		5.00 REF	
P	0.079 REF		2.00 REF	
R	0.039 REF		0.99 REF	
S	0.575	0.625	14.60	15.88
V	0.045	0.055	1.14	1.40



SWITCHMODE is a trademark of Semiconductor Components Industries, LLC (SCILLC).

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marketing.pdf. SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative



**Стандарт
Электрон
Связь**

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331