MOSFET

OptiMOS™3 Power-MOSFET, 80 V

MG-WDSON-2-6

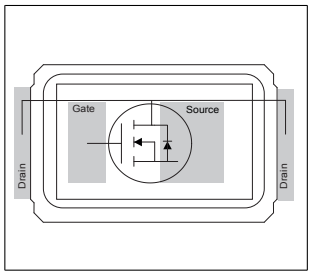


Features

- Optimized technology for DC/DC converters
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Low profile (<0.7mm)
- Dual sided cooling
- Low parasitic inductance
- N-channel, normal level

Table 1 Key Performance Parameters

Parameter	Value	Unit
V_{DS}	80	V
$R_{DS(on),max}$	10.4	mΩ
I_D	50	A



Type / Ordering Code	Package	Marking	Related Links
BSB104N08NP3 G	MG-WDSON-2	0308	-

Table of Contents

Description 1
Maximum ratings 3
Thermal characteristics 3
Electrical characteristics 4
Electrical characteristics diagrams 6
Package Outlines 10
Revision History 13
Trademarks 13
Disclaimer 13

1 Maximum ratings

at T_A=25 °C, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Continuous drain current	I_D	- - -	- - -	50 32 13	A	V_{GS}=10 V, T_C=25 °C V_{GS}=10 V, T_C=100 °C V_{GS}=10 V, T_A=25 °C, R_{thJA}=45 K/W[1)]
Pulsed drain current[2)]	$I_{D,pulse}$	-	-	200	A	T_C=25 °C
Avalanche energy, single pulse[3)]	E_{AS}	-	-	110	mJ	I_D=30 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	- -	- -	42 2.8	W	T_C=25 °C T_A=25 °C, R_{thJA}=45 K/W[1)]
Operating and storage temperature	T_j, T_{stg}	-40	-	150	°C	-

2 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case, bottom	R_{thJC}	-	1.0	-	K/W	-
Thermal resistance, junction - case, top	R_{thJC}	-	-	3.0	K/W	-
Device on PCB, 6 cm^2 cooling area[1)]	R_{thJA}	-	-	45	K/W	-

[1)] Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm^2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.
[2)] See Diagram 3 for more detailed information
[3)] See Diagram 13 for more detailed information

3 Electrical characteristics

at T_j=25 °C, unless otherwise specified

Table 4 Static characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	80	-	-	V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	2.0	2.7	3.5	V	V_{DS}=V_{GS}, I_D=40 µA
Zero gate voltage drain current	I_{DSS}	- -	0.1 10	10 100	µA	V_{DS}=80 V, V_{GS}=0 V, T_j=25 °C V_{DS}=80 V, V_{GS}=0 V, T_j=125 °C
Gate-source leakage current	I_{GSS}	-	10	100	nA	V_{GS}=20 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	-	9.3	10.4	mΩ	V_{GS}=10 V, I_D=10 A
Gate resistance	R_G	-	2	-	Ω	-
Transconductance	g_{fs}	23	46	-	S	|V_{DS}|>2|I_D|$R_{DS(on)max}$, I_D=30 A

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	1600	2100	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Output capacitance	C_{oss}	-	430	570	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	29	44	pF	V_{GS}=0 V, V_{DS}=40 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	9	-	ns	V_{DD}=40 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Rise time	t_r	-	4	-	ns	V_{DD}=40 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Turn-off delay time	$t_{d(off)}$	-	19	-	ns	V_{DD}=40 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Fall time	t_f	-	4	-	ns	V_{DD}=40 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω

Table 6 Gate charge characteristics[1)]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	8	11	nC	V_{DD}=40 V, I_D=30 A, V_{GS}=0 to 10 V
Gate to drain charge	Q_{gd}	-	5	8	nC	V_{DD}=40 V, I_D=30 A, V_{GS}=0 to 10 V
Switching charge	Q_{sw}	-	8	13	nC	V_{DD}=40 V, I_D=30 A, V_{GS}=0 to 10 V
Gate charge total	Q_g	-	23	31	nC	V_{DD}=40 V, I_D=30 A, V_{GS}=0 to 10 V
Gate plateau voltage	$V_{plateau}$	-	5.0	-	V	V_{DD}=40 V, I_D=30 A, V_{GS}=0 to 10 V
Output charge	Q_{oss}	-	31	42	nC	V_{DD}=40 V, V_{GS}=0 V

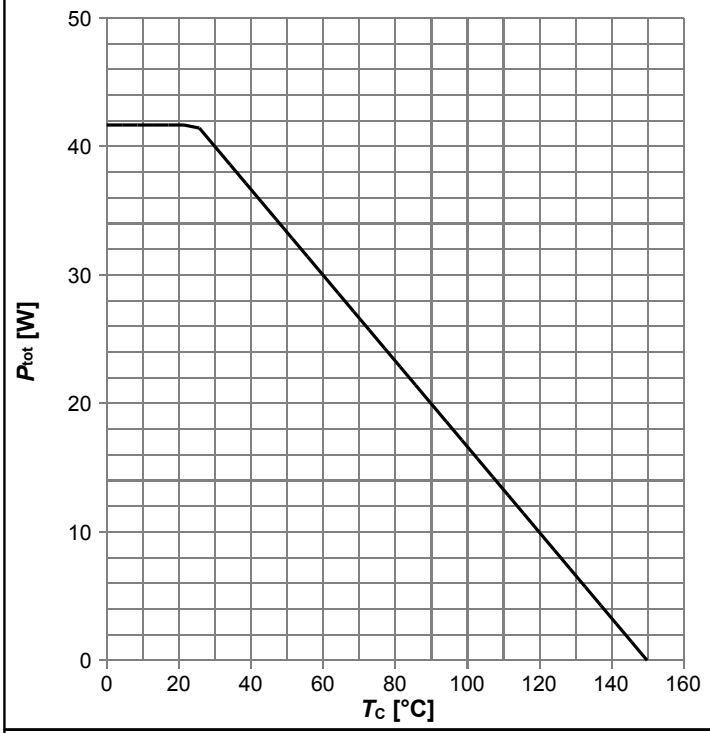
[1)] See ″Gate charge waveforms″ for parameter definition

Table 7 Reverse diode

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	30	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	200	A	T_C=25 °C
Diode forward voltage	V_{SD}	-	0.9	1.2	V	V_{GS}=0 V, I_F=30 A, T_j=25 °C
Reverse recovery time	t_{rr}	-	43	-	ns	V_R=40 V, I_F=30 A, di_F/dt=100 A/µs
Reverse recovery charge	Q_{rr}	-	55	-	nC	V_R=40 V, I_F=30 A, di_F/dt=100 A/µs

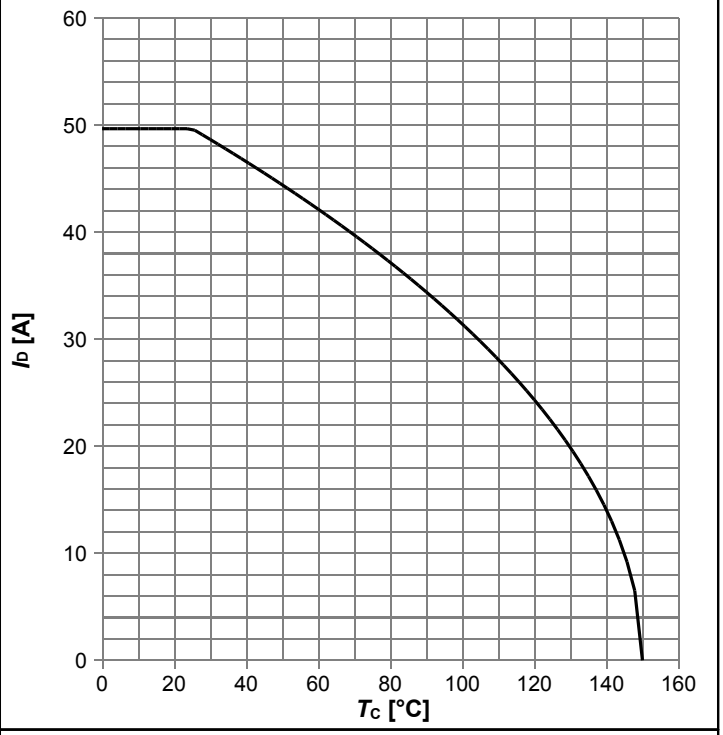
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



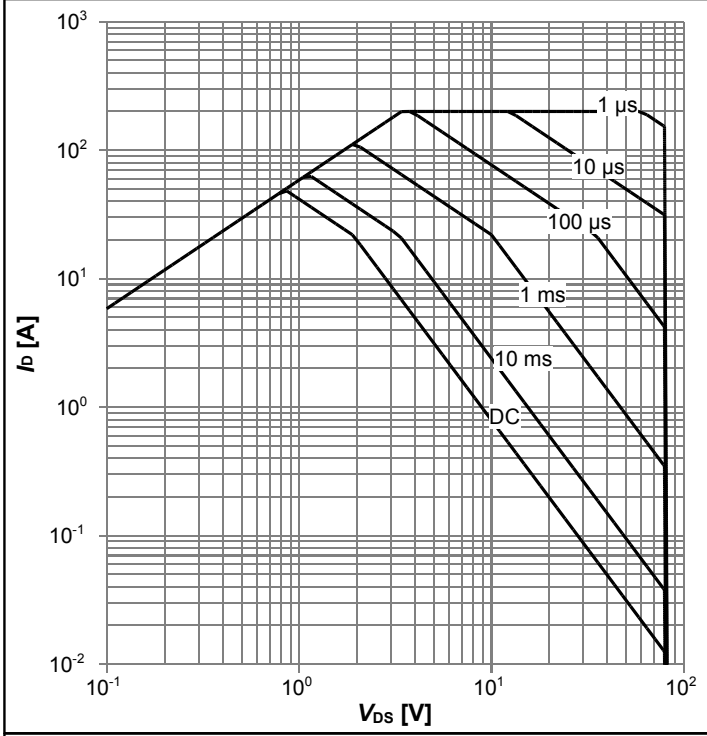
$P_{tot}=f(T_C)$

Diagram 2: Drain current



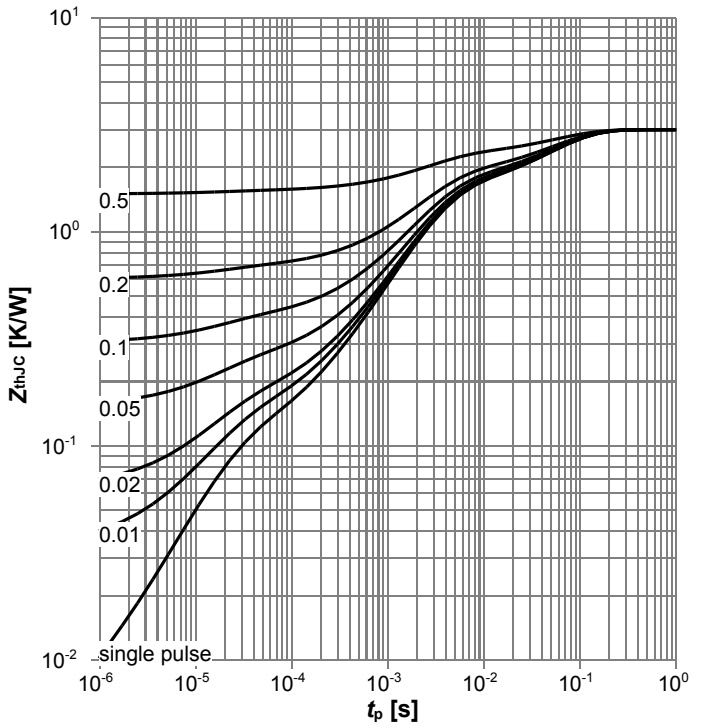
$I_D=f(T_C)$; $V_{GS}\geq 10$ V

Diagram 3: Safe operating area



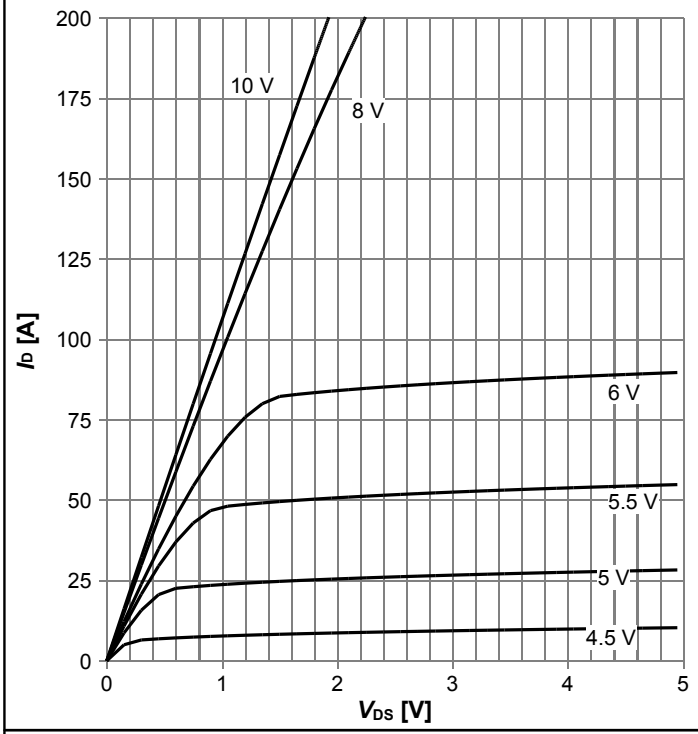
$I_D=f(V_{DS})$; $T_C=25$ °C; $D=0$; parameter: t_p

Diagram 4: Max. transient thermal impedance



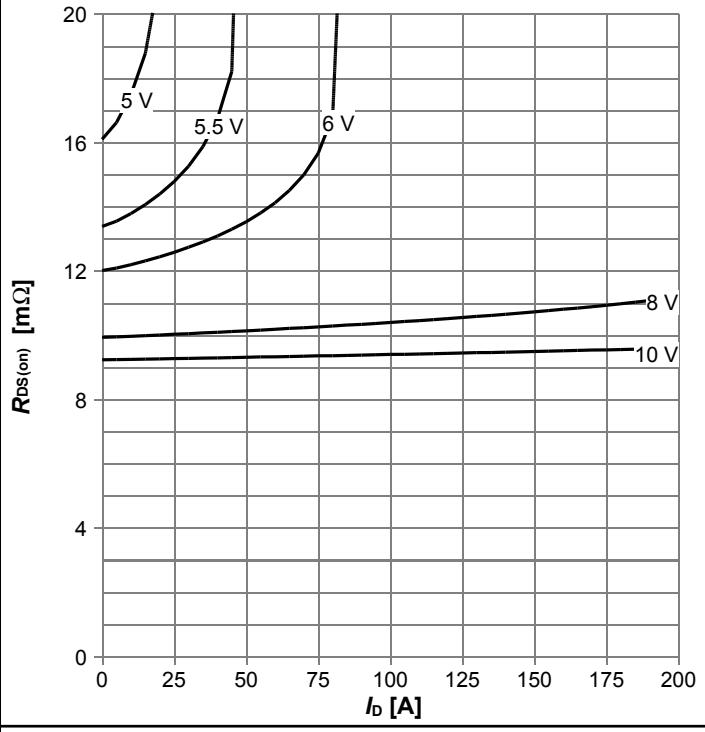
$Z_{thJC}=f(t_p)$; parameter: $D=t_p/T$

Diagram 5: Typ. output characteristics



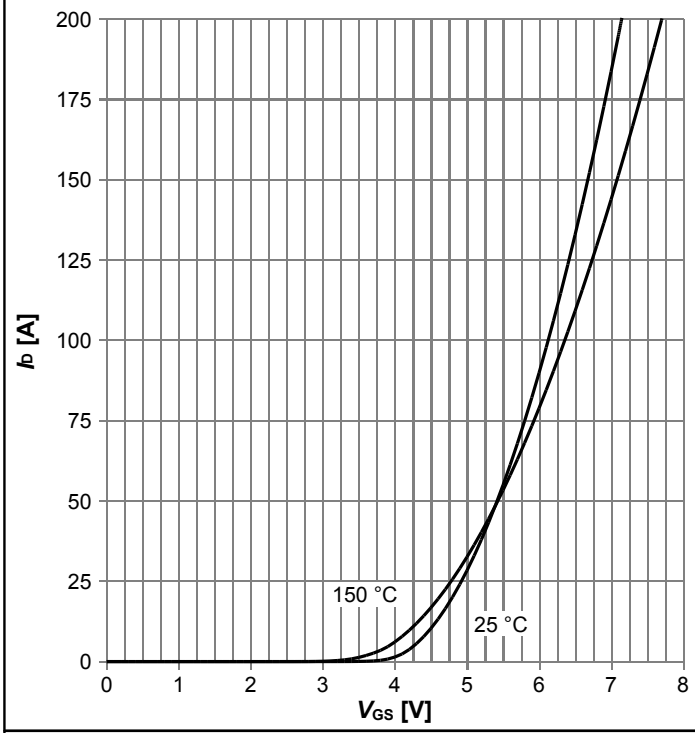
$I_D=f(V_{DS})$, $T_j=25$ °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



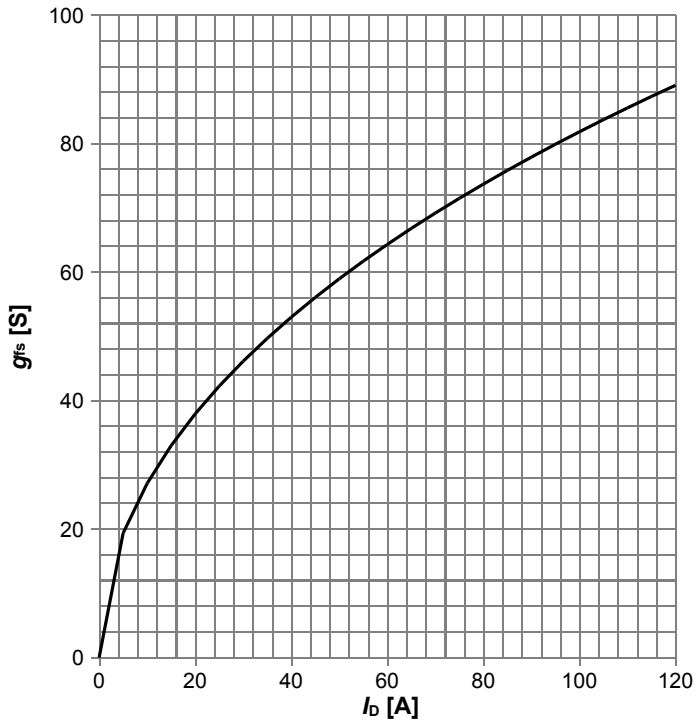
$R_{DS(on)}=f(I_D)$, $T_j=25$ °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



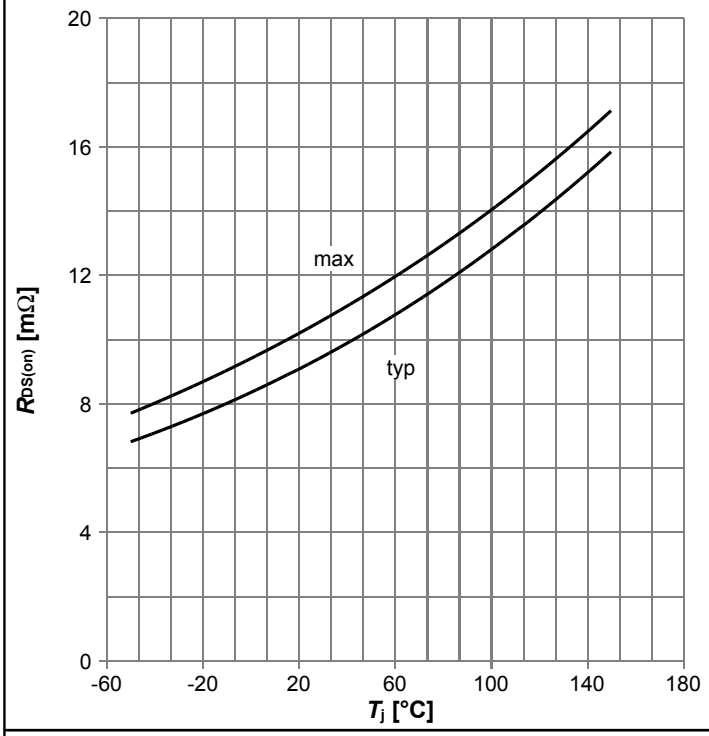
$I_D=f(V_{GS})$, $|V_{DS}|>2|I_D|R_{DS(on)max}$, $T_j=25$ °C

Diagram 8: Typ. forward transconductance



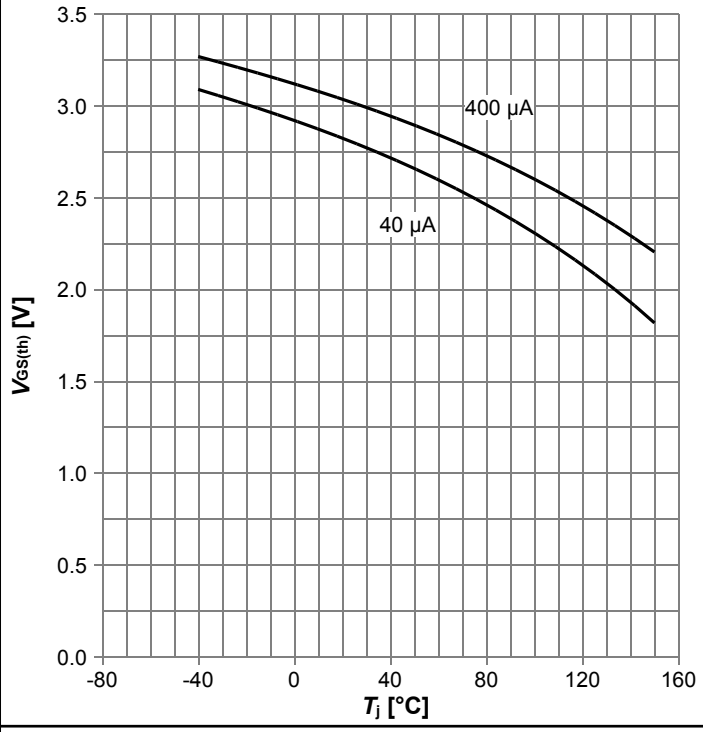
$g_{fs}=f(I_D)$, $V_{DS}=3$ V, $T_j=25$ °C

Diagram 9: Drain-source on-state resistance



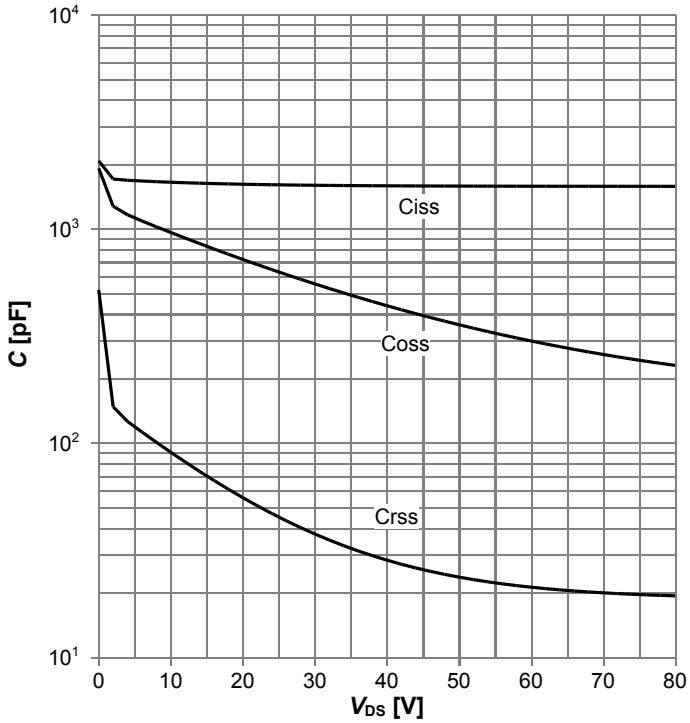
$R_{DS(on)}$=f(T_j), I_D=20 A, V_{GS}=10 V

Diagram 10: Typ. gate threshold voltage



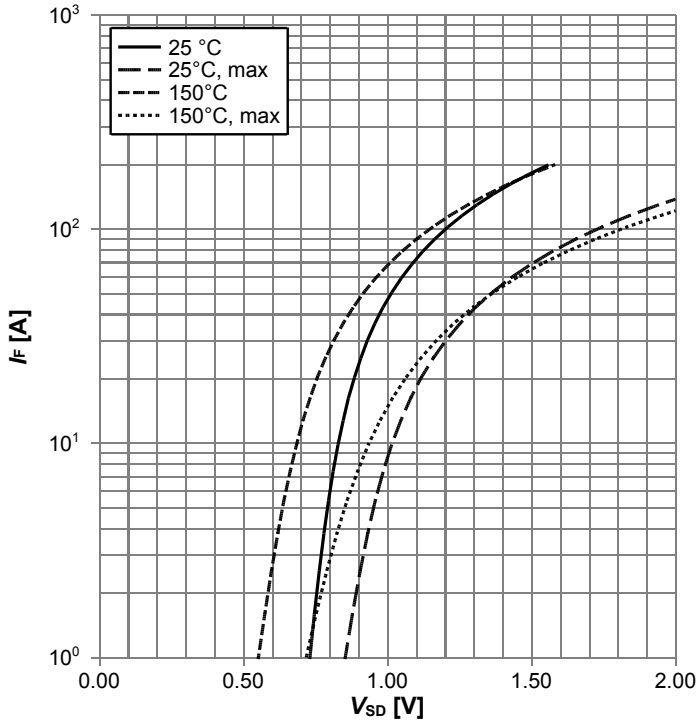
$V_{GS(th}$=f(T_j), V_{GS}=V_{DS}; parameter: I_D

Diagram 11: Typ. capacitances



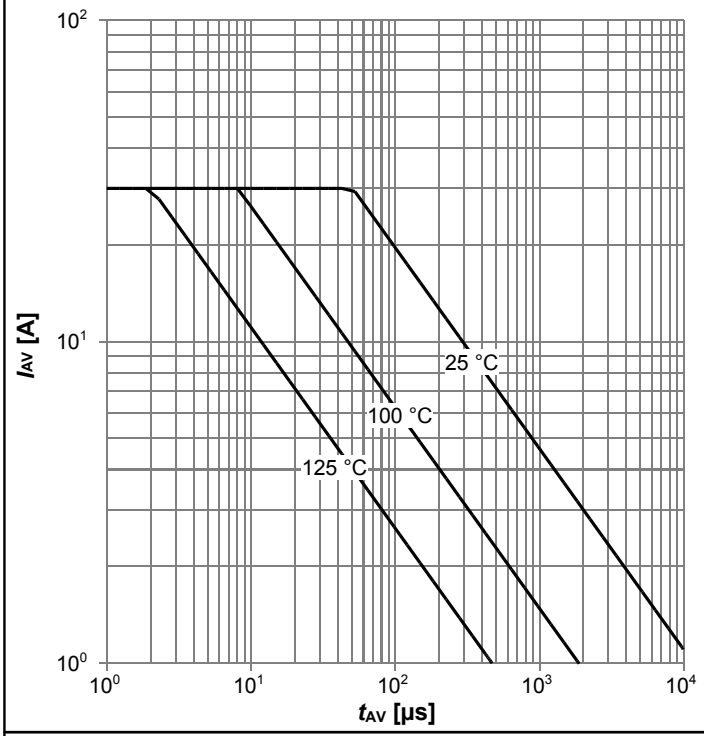
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz

Diagram 12: Forward characteristics of reverse diode



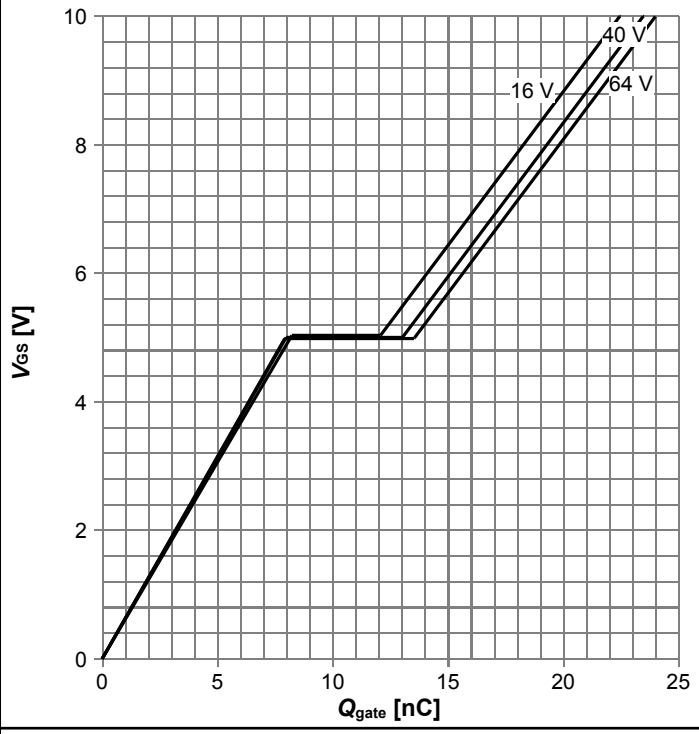
I_F=f(V_{SD}); parameter: T_j

Diagram 13: Avalanche characteristics



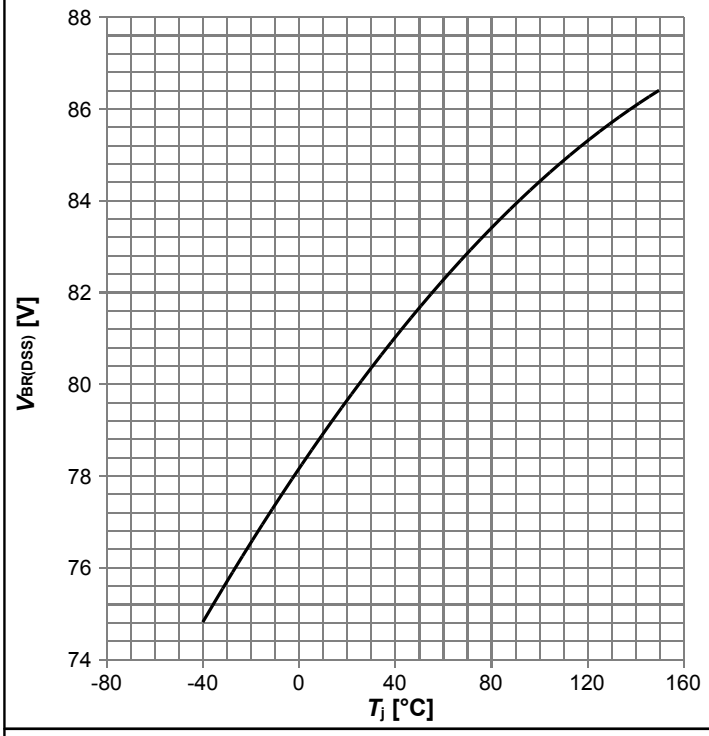
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; parameter: $T_{j,start}$

Diagram 14: Typ. gate charge



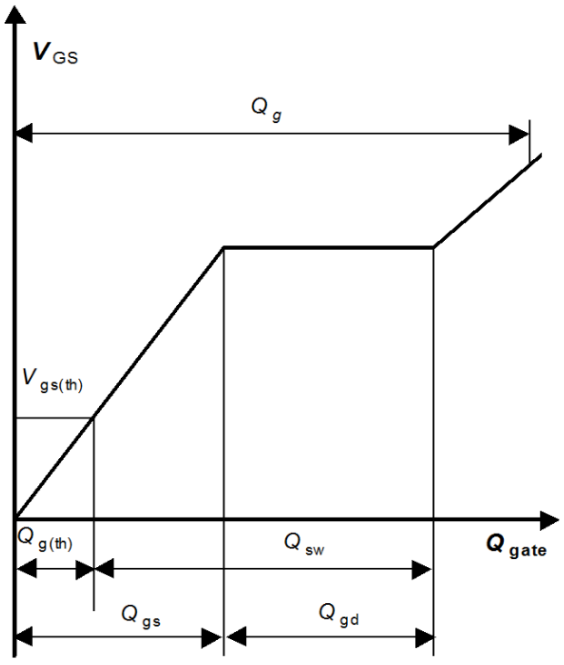
V_{GS}=f(Q_{gate}), I_D=30 A pulsed, T_j=25 °C; parameter: V_{DD}

Diagram 15: Drain-source breakdown voltage



$V_{BR(DSS)}$=f(T_j); I_D=1 mA

Diagram Gate charge waveforms



5 Package Outlines

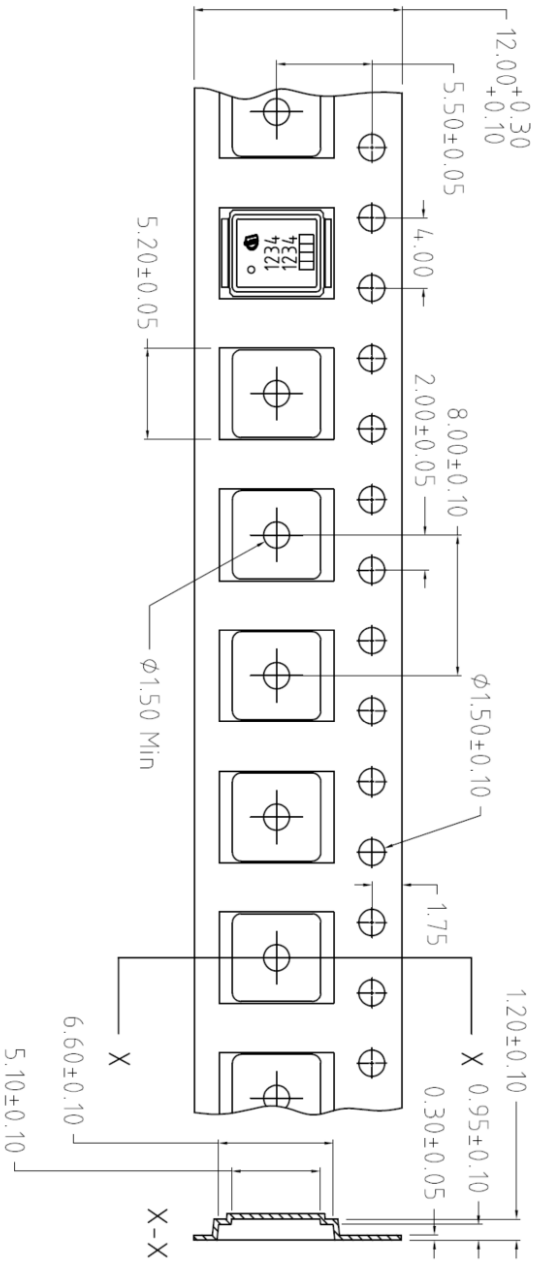


Figure 1 Outline Tape (CanPAK M)

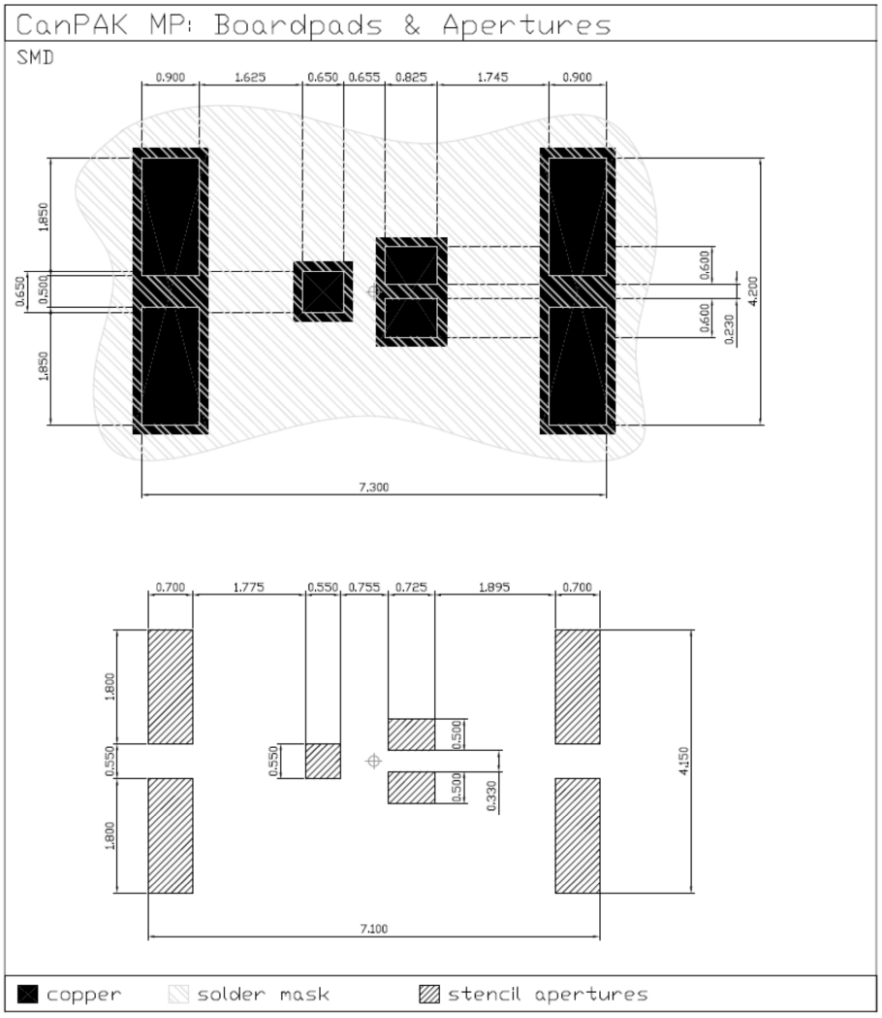
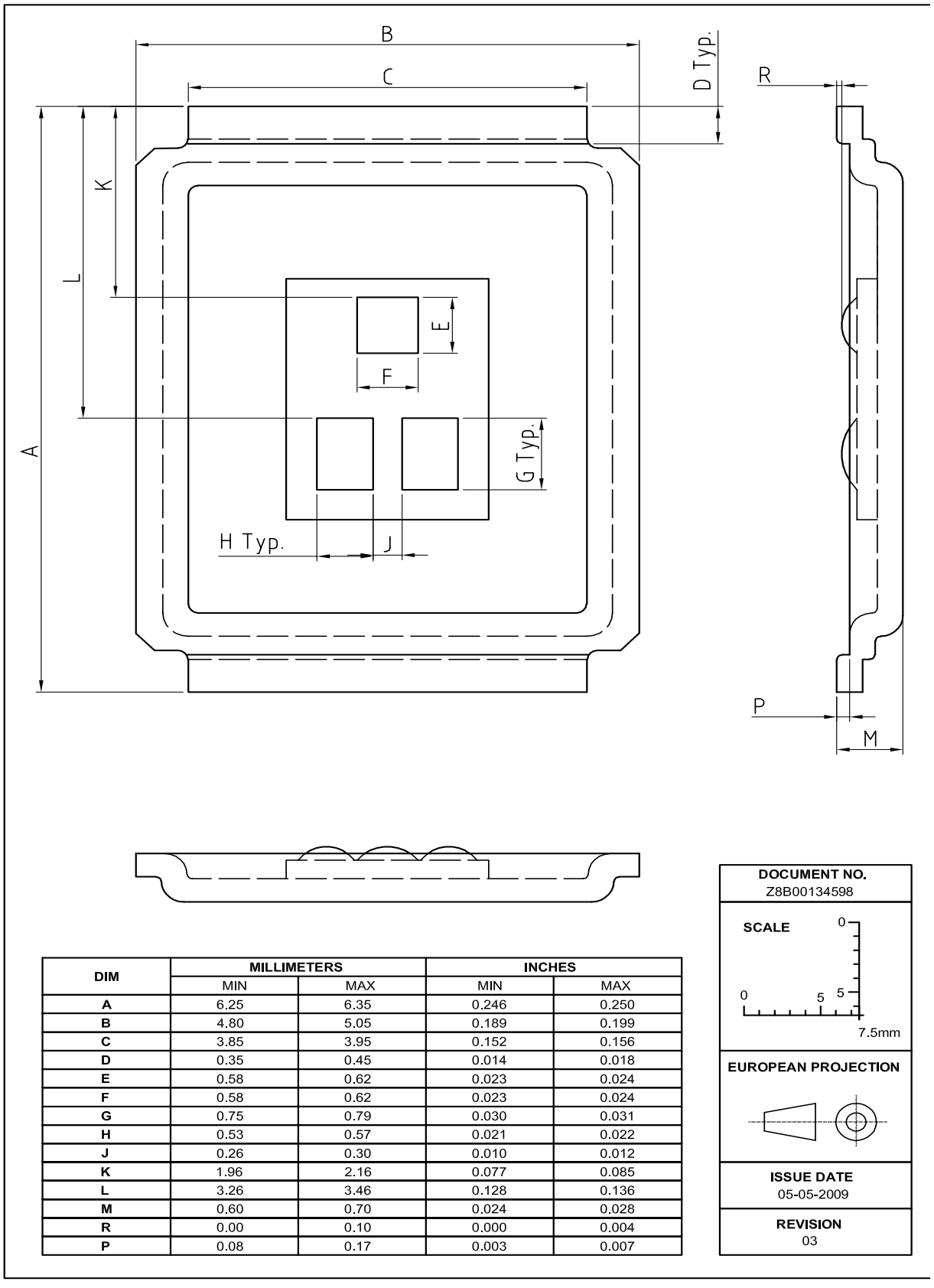


Figure 2 Outline Boardpads (CanPAK M)



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.25	6.35	0.246	0.250
B	4.80	5.05	0.189	0.199
C	3.85	3.95	0.152	0.156
D	0.35	0.45	0.014	0.018
E	0.58	0.62	0.023	0.024
F	0.58	0.62	0.023	0.024
G	0.75	0.79	0.030	0.031
H	0.53	0.57	0.021	0.022
J	0.26	0.30	0.010	0.012
K	1.96	2.16	0.077	0.085
L	3.26	3.46	0.128	0.136
M	0.60	0.70	0.024	0.028
R	0.00	0.10	0.000	0.004
P	0.08	0.17	0.003	0.007

DOCUMENT NO.
Z8B00134598

SCALE
0 5 5
7.5mm

EUROPEAN PROJECTION

ISSUE DATE
05-05-2009

REVISION
03

Figure 3 Outline MG-WDSON-2, dimensions in mm/inches

Revision History

BSB104N08NP3 G

Revision: 2018-11-15, Rev. 2.2

Previous Revision		
Revision	Date	Subjects (major changes since last revision)
2.2	2018-11-15	Update model

Trademarks
All referenced product or service names and trademarks are the property of their respective owners.

We Listen to Your Comments
Any information within this document that you feel is wrong, unclear or missing at all? Your feedback will help us to continuously improve the quality of this document. Please send your proposal (including a reference to this document) to:
erratum@infineon.com

Published by
Infineon Technologies AG
81726 München, Germany
© 2018 Infineon Technologies AG
All Rights Reserved.

Legal Disclaimer
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics (“Beschaffenheitsgarantie”) .

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.
In addition, any information given in this document is subject to customer’s compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.
The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

Information
For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office (**www.infineon.com**).

Warnings
Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.
The Infineon Technologies component described in this Data Sheet may be used in life-support devices or systems and/or automotive, aviation and aerospace applications or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support, automotive, aviation and aerospace device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

Unikeyic Electronics

Global Electronic Components Distributor

Click to view pricing, inventory, delivery, and lifecycle information:

Infineon Technologies:

IPD60R280P7S TD340N22KOFXPSA1 TLE6250G V33 CY15V108QN-20LPXC CY8C29466-24SXIT IPD60R360P7S IPW60R070CFD7 IRF7820TRPBF BSS126IXTSA1 IRF7853TRPBF TLS4120D0EPVXUMA1 IRF3710PBF EVALPMG1B1DRPTOBO1 FF800R12KE7EHPSA1 IMWH170R450M1XKSA1 IPT60R016CM8XTMA1 IPW60R018CFD7XKSA1 IR3895MTRPBF BSC077N12NS3 G IPB042N10N3 G IRFP2907PBF TLE5046IC-AK-LR IDH12SG60C BTS 5210 G IR2302STRPBF IRF5210PBF IRFS4227TRLPBF TDA21590 IPF012N06NF2SATMA1 IPF010N04NF2SATMA1