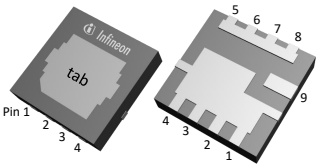
MOSFET

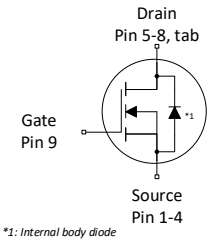
PG-WHTFN-9 (3x3)

OptiMOS™ 7 Power-Transistor, 25 V



Features

- N-channel, logic level
- Optimized for hard-switching topologies
- Optimized for best FOM_{oss}
- Excellent Miller ratio for dv/dt ruggedness
- Very low on-resistance $R_{DS(on)}$
- Superior thermal resistance, dual side cooling feature
- 100% avalanche tested
- Pb-free lead plating; RoHS compliant
- Halogen-free according to IEC61249-2-21



Product validation

Qualified for industrial applications according to the relevant tests of JEDEC JESD47, JESD22 and J-STD-020.

Table 1 Key performance parameters

Parameter	Value	Unit
V_{DS}	25	V
$R_{DS(on),max}$	0.5	mΩ
I_D	422	A
Q_{oss}	38	nC
Q_G (0V...10V)	57	nC

Hal Pb RoHS

Part number	Package	Marking	Related links
IQEH50NE2LM7UCGSC	PG-WHTFN-9	B	-

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 14
Disclaimer 14

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 [1]	I_D	-	-	422	A	V_{GS}=10 V, T_C=25 °C
				298		V_{GS}=10 V, T_C=100 °C
				236		V_{GS}=4.5 V, T_C=100 °C
				54		V_{GS}=10 V, T_A=25 °C, R_{thJA}=60 °C/W [2]
Pulsed drain current [3]	$I_{D,pulse}$	-	-	1688	A	T_C=25 °C
Avalanche energy, single pulse [4]	E_{AS}	-	-	340	mJ	I_D=20 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-16	-	16	V	-
Power dissipation	P_{tot}	-	-	150	W	T_C=25 °C
				2.5		T_A=25 °C, R_{thJA}=60 °C/W [2]
Operating and storage temperature	T_j, T_{stg}	-55	-	175	°C	-

[1] Rating refers to the product only with datasheet specified absolute maximum values, maintaining case temperature as specified. For other case temperatures please refer to Diagram 2. De-rating will be required based on the actual environmental conditions.

[2] 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.

[3] See Diagram 3 for more detailed information

[4] See Diagram 13 for more detailed information

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	°C/W	-
Thermal resistance, junction - case, top	R_{thJC}		0.7	-		
Thermal resistance, junction - ambient, 6 cm² cooling area [5]	R_{thJA}		-	60		

[5] 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.

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	$V_{(BR)DSS}$	25	-	-	V	V_{GS}=0 V, I_D=1 mA
Gate threshold voltage	$V_{GS(th)}$	1.4	1.7	2.0	V	V_{DS}=V_{GS}, I_D=432 µA
Zero gate voltage drain current	I_{DSS}	-	0.1	1	µA	V_{DS}=22 V, V_{GS}=0 V, T_j=25 °C
			10	100		V_{DS}=22 V, V_{GS}=0 V, T_j=125 °C
Gate-source leakage current	I_{GSS}	-	10	100	nA	V_{GS}=16 V, V_{DS}=0 V
Drain-source on-state resistance	$R_{DS(on)}$	-	0.45	0.5	mΩ	V_{GS}=10 V, I_D=20 A
			0.66	0.8		V_{GS}=4.5 V, I_D=20 A
Gate resistance	R_G	-	0.75	-	Ω	-
Transconductance	g_{fs}	55	110	-	S	$\|V_{DS}\|\geq 2\|I_D\|R_{DS(on)max}$, I_D=20 A

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	4700	6100	pF	V_{GS}=0 V, V_{DS}=12 V, f=1 MHz
Output capacitance	C_{oss}		1800	-		
Reverse transfer capacitance	C_{rss}		81	-		
Turn-on delay time	$t_{d(on)}$	-	7.0	-	ns	V_{DD}=12 V, V_{GS}=10 V, I_D=20 A, $R_{G,ext}$=3 Ω
Rise time	t_r		2.0			
Turn-off delay time	$t_{d(off)}$		29			
Fall time	t_f		4.4			

Table 6 Gate charge characteristics [6)]

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	13.3	-	nC	V_{DD}=12 V, I_D=20 A, V_{GS}=0 to 4.5 V
Gate charge at threshold	$Q_{g(th)}$		8.1		nC	
Gate to drain charge	Q_{gd}		4.2		nC	
Switching charge	Q_{sw}		9.4		nC	
Gate charge total	Q_g		27		nC	
Gate plateau voltage	$V_{plateau}$		2.8		V	
Gate charge total	Q_g	-	57	-	nC	V_{DD}=12 V, I_D=20 A, V_{GS}=0 to 10 V
Output charge	Q_{oss}	-	38	-	nC	V_{DS}=12 V, V_{GS}=0 V

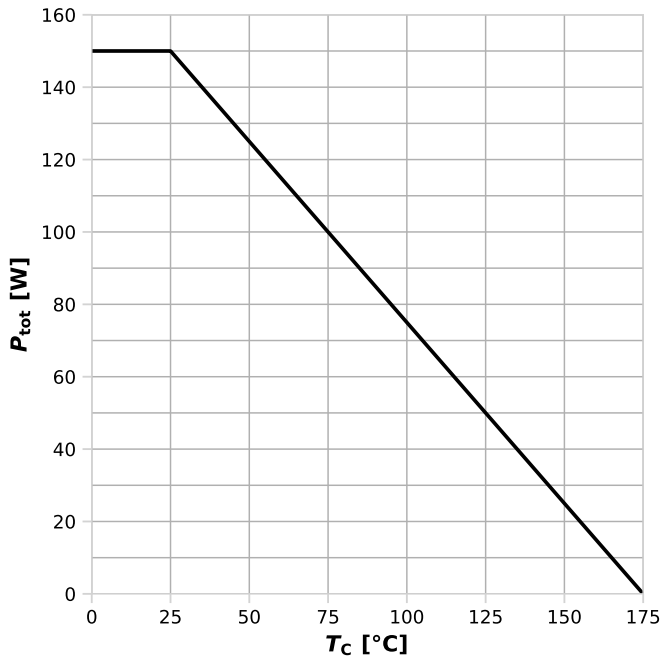
[6)] See "Gate charge waveforms" for parameter definition

Table 7 Reverse diode

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	138	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$			1688		
Diode forward voltage	V_{SD}	-	0.76	1.0	V	V_{GS}=0 V, I_F=20 A, T_j=25 °C
Reverse recovery time	t_{rr}	-	25	-	ns	V_R=12 V, I_F=20 A, di_F/dt=400 A/µs
Reverse recovery charge	Q_{rr}		88		nC	

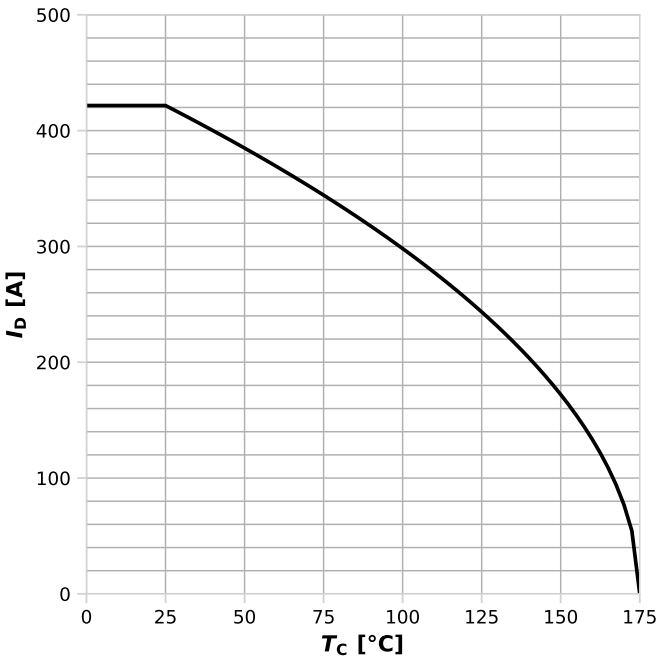
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



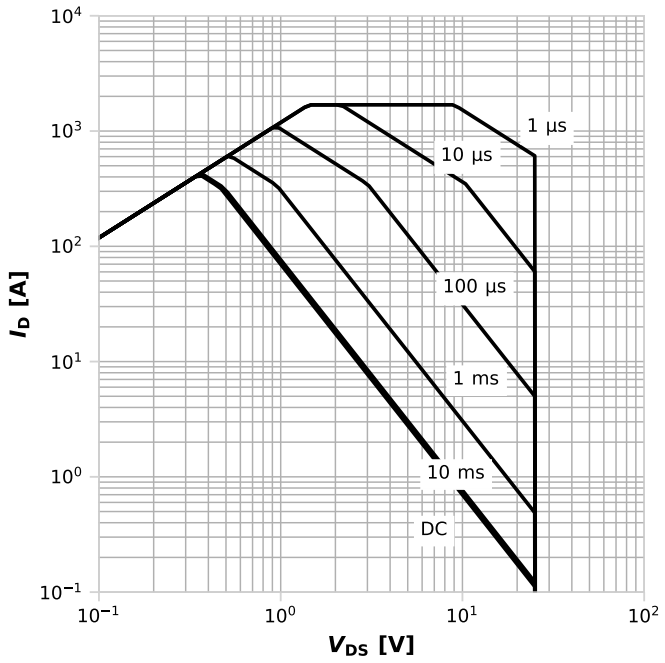
P_{tot}=f(T_C)

Diagram 2: Drain current



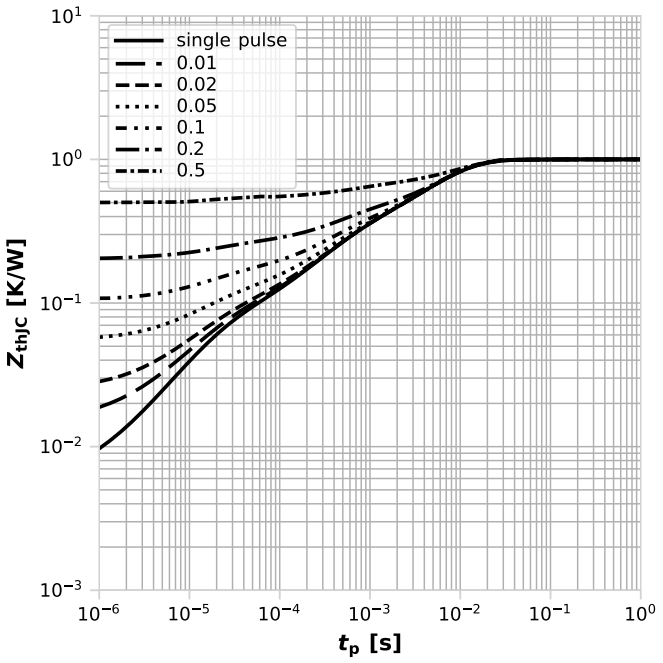
I_D=f(T_C); V_{GS}≥10 V

Diagram 3: Safe operating area



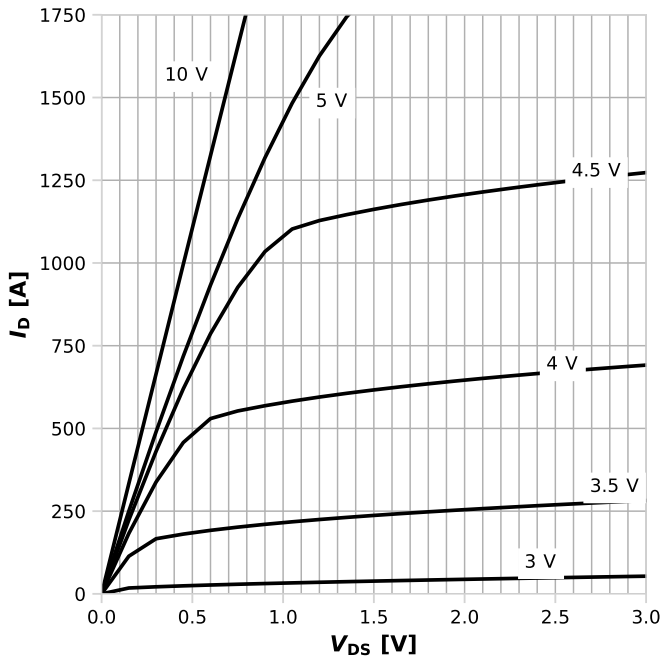
I_D=f(V_{DS}); T_C=25 °C; D=0; parameter: t_p

Diagram 4: Max. transient thermal impedance



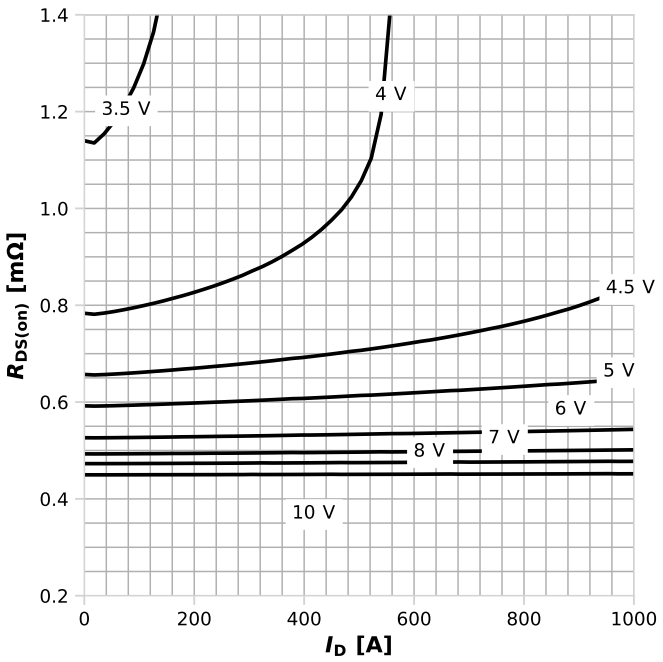
Z_{thJC}=f(t_p); parameter: D=t_p/T

Diagram 5: Typ. output characteristics



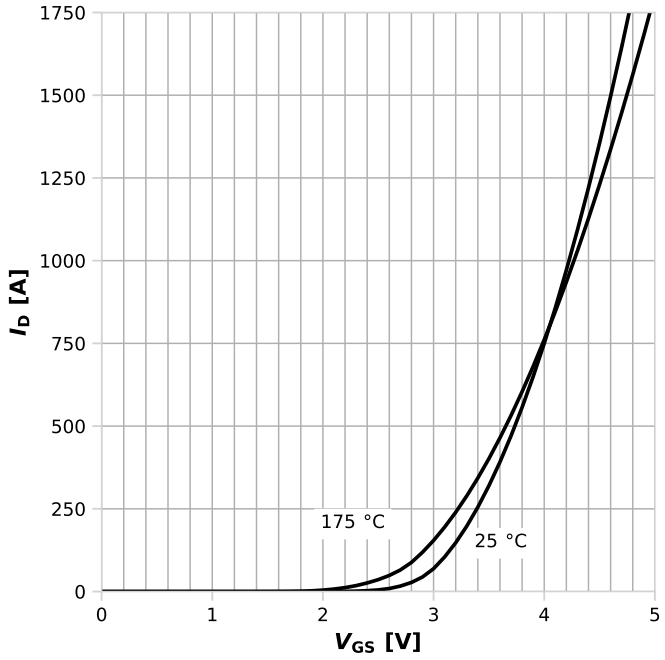
I_D=f(V_{DS}), T_j=25 °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



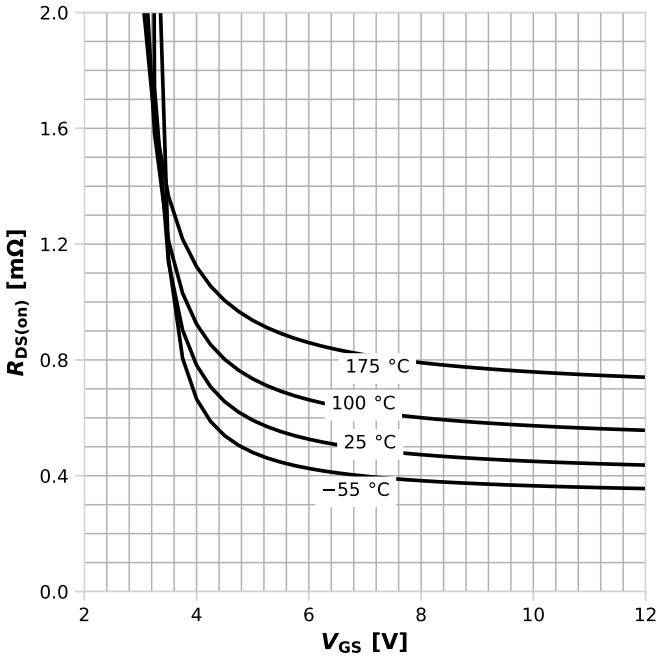
$R_{DS(on)}$=f(I_D), T_j=25 °C; parameter: V_{GS}

Diagram 7: Typ. transfer characteristics



I_D=f(V_{GS}), $|V_{DS}|>2|I_D|R_{DS(on)max}$; parameter: T_j

Diagram 8: Typ. drain-source on resistance



$R_{DS(on)}$=f(V_{GS}), I_D=20 A; parameter: T_j

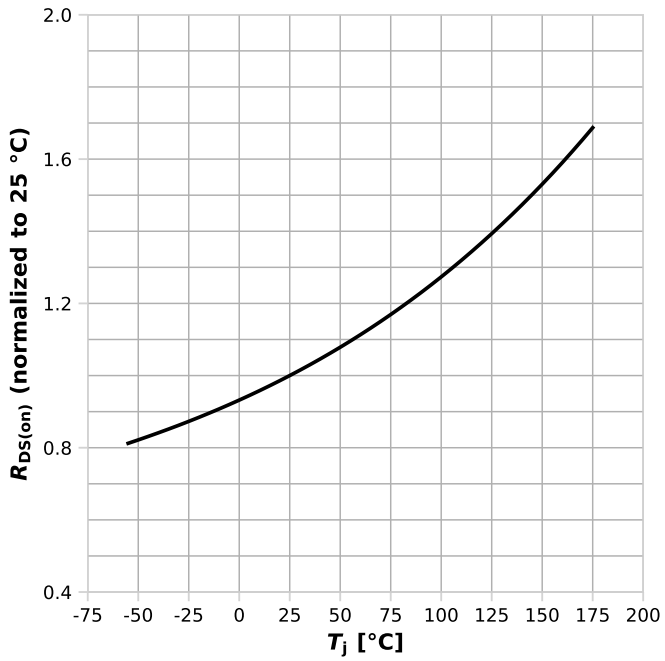
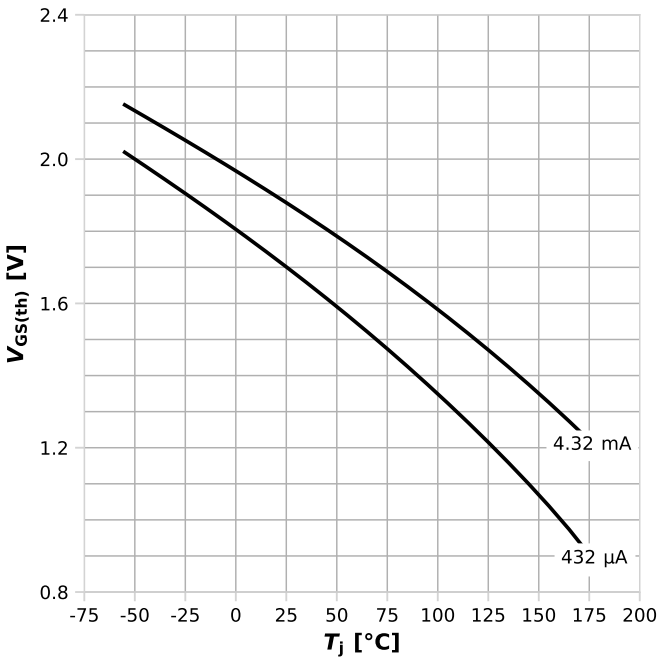
Diagram 9: Normalized drain-source on resistance	Diagram 10: Typ. gate threshold voltage
	
$R_{DS(on)}$=f(T_j), I_D=20 A, V_{GS}=10 V	$V_{GS(th)}$=f(T_j), V_{GS}=V_{DS}; parameter: I_D

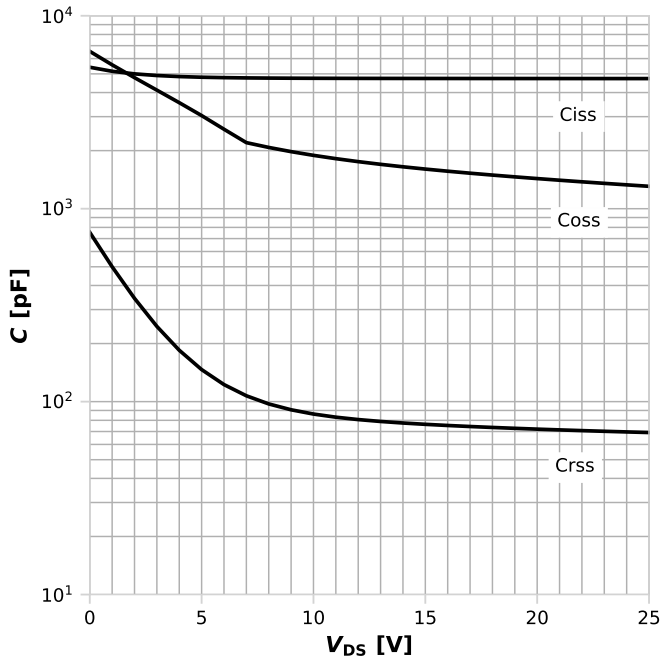
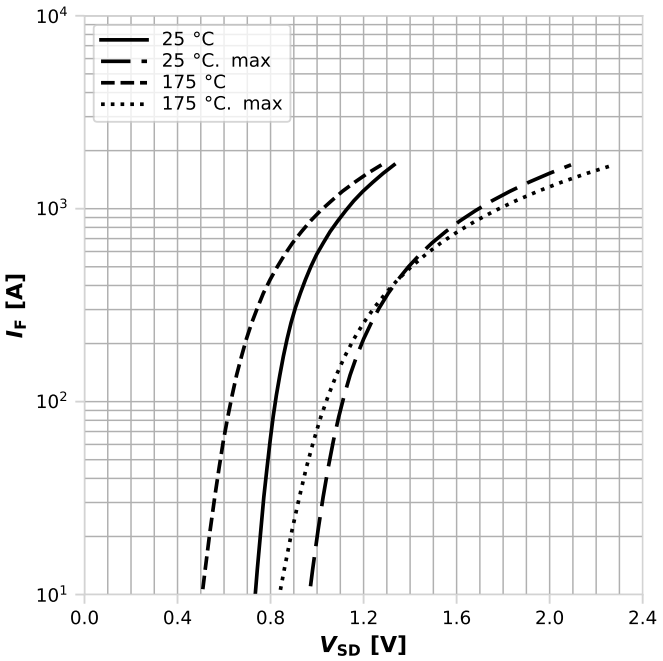
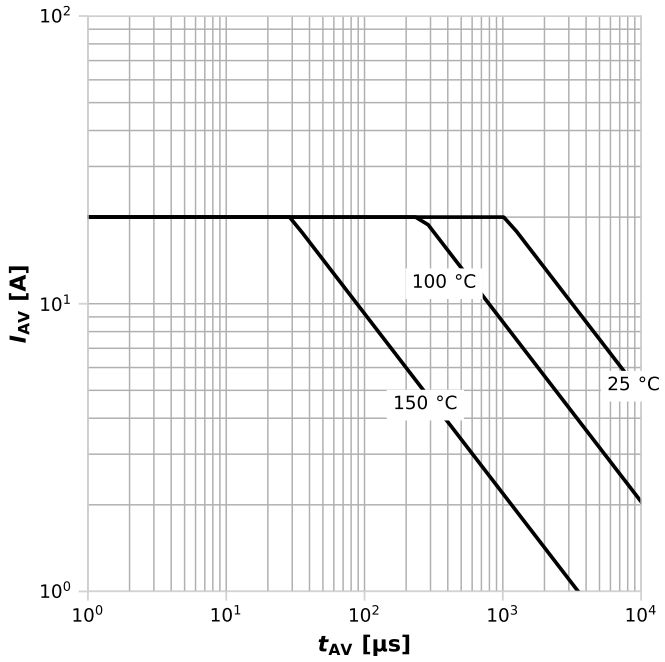
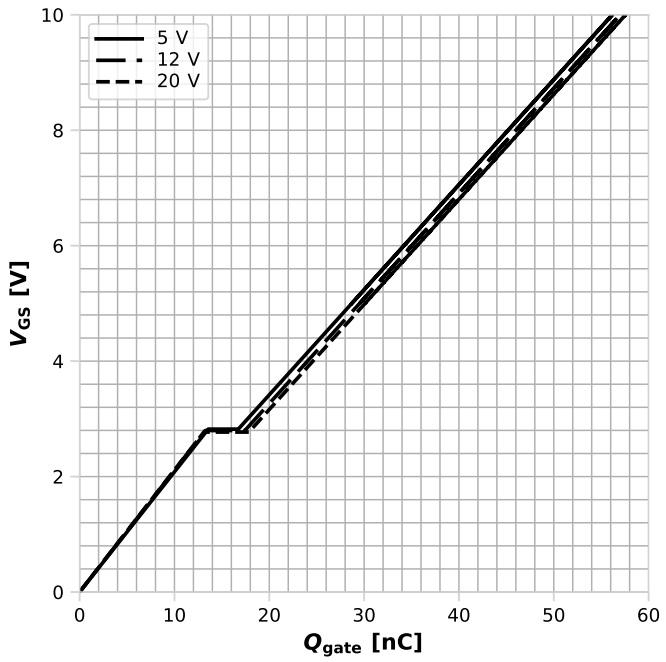
Diagram 11: Typ. capacitances	Diagram 12: Forward characteristics of reverse diode
	
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz	I_F=f(V_{SD}); parameter: T_j

Diagram 13: Avalanche characteristics



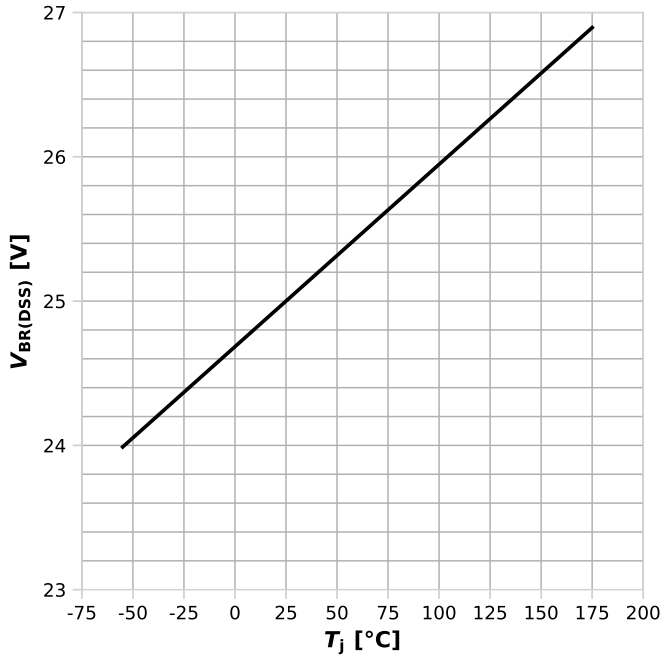
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; parameter: $T_{j,start}$

Diagram 14: Typ. gate charge



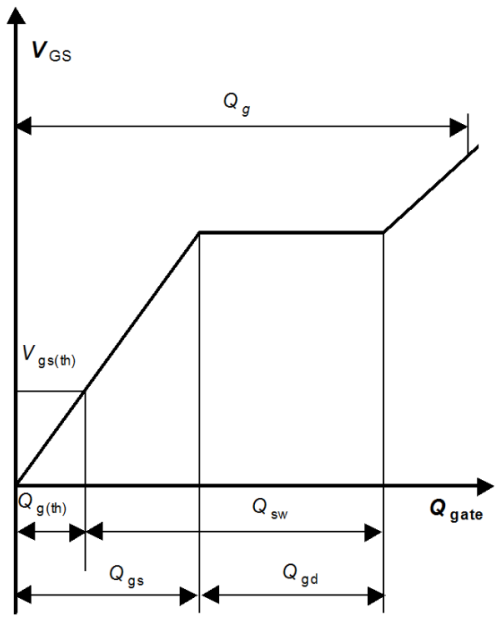
V_{GS}=f(Q_{gate}), I_D=20 A pulsed, T_j=25 °C; parameter: V_{DD}

Diagram 15: Min. drain-source breakdown voltage



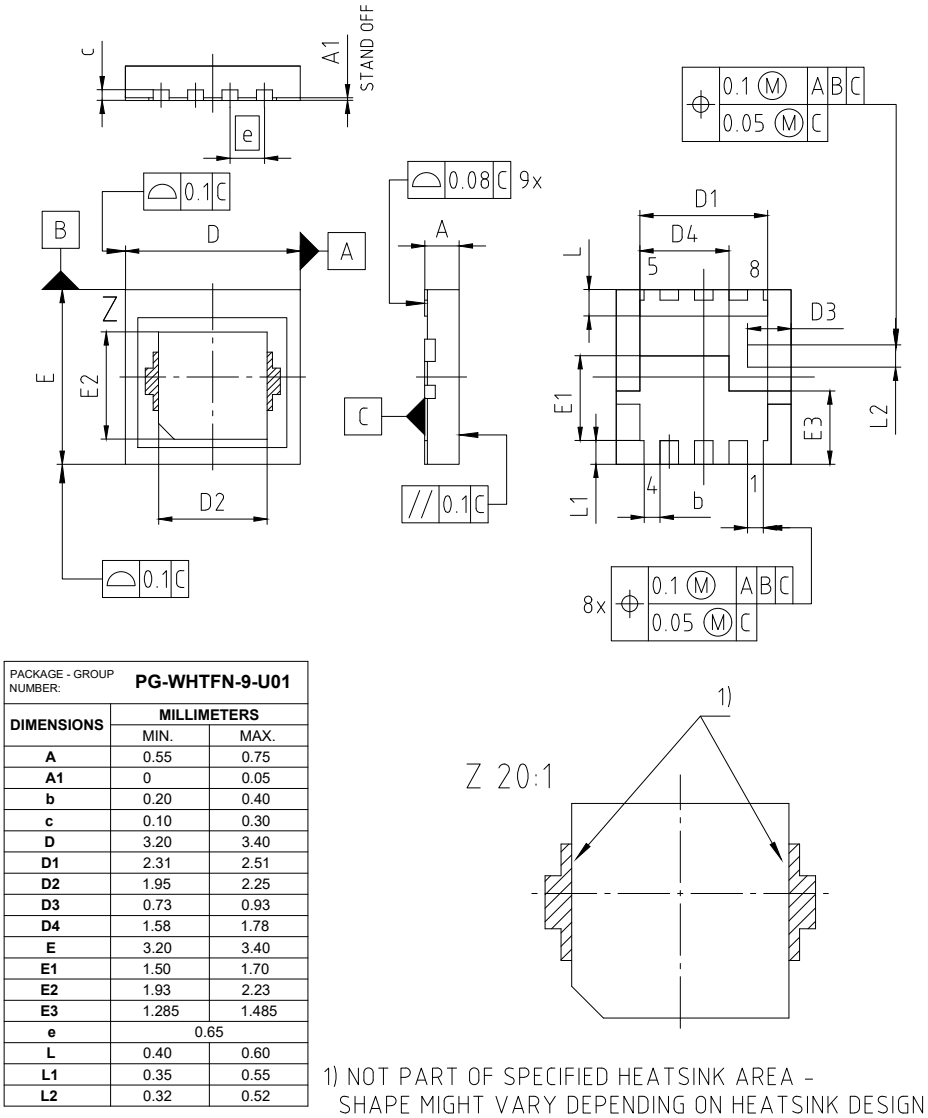
$V_{BR(DSS)}$=f(T_j); I_D=1 mA

Gate charge waveforms



-

5 Package outlines



PACKAGE - GROUP NUMBER:	PG-WHTFN-9-U01	
DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	0.55	0.75
A1	0	0.05
b	0.20	0.40
c	0.10	0.30
D	3.20	3.40
D1	2.31	2.51
D2	1.95	2.25
D3	0.73	0.93
D4	1.58	1.78
E	3.20	3.40
E1	1.50	1.70
E2	1.93	2.23
E3	1.285	1.485
e	0.65	
L	0.40	0.60
L1	0.35	0.55
L2	0.32	0.52

Figure 1 Outline PG-WHTFN-9, dimensions in mm

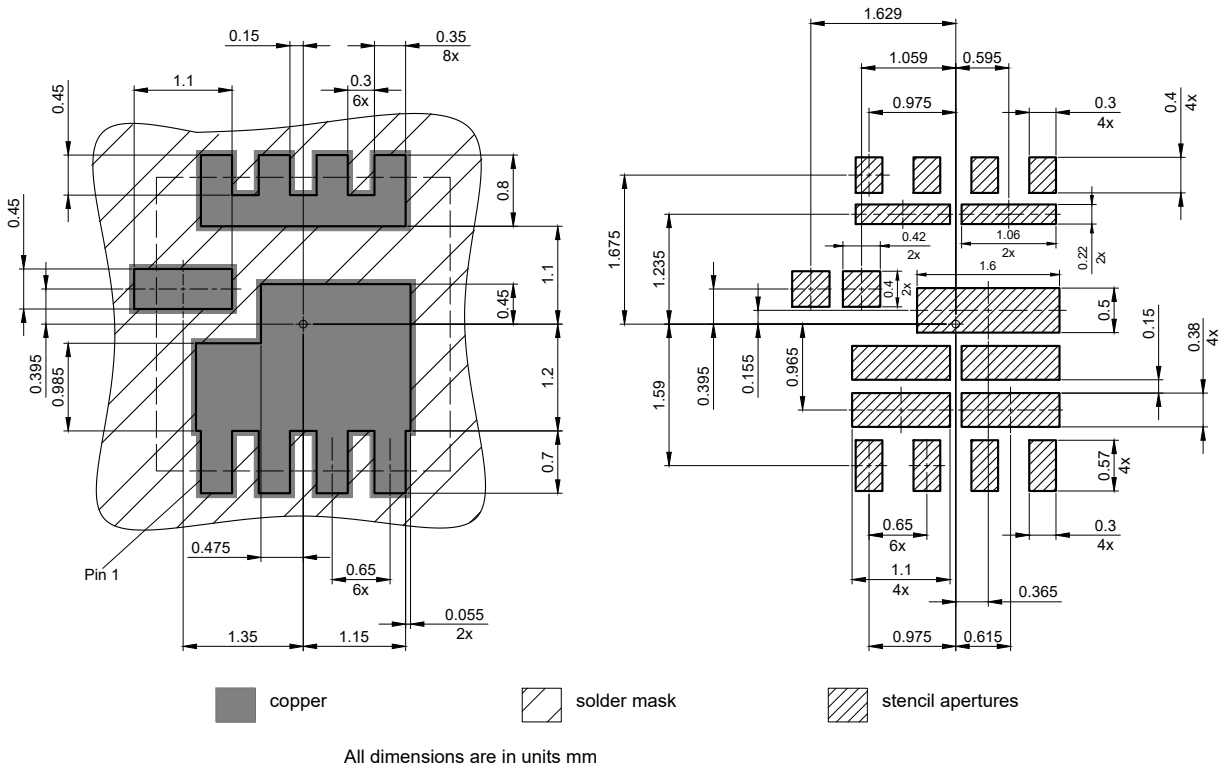


Figure 2 Footprint drawing PG-WHTFN-9, dimensions in mm

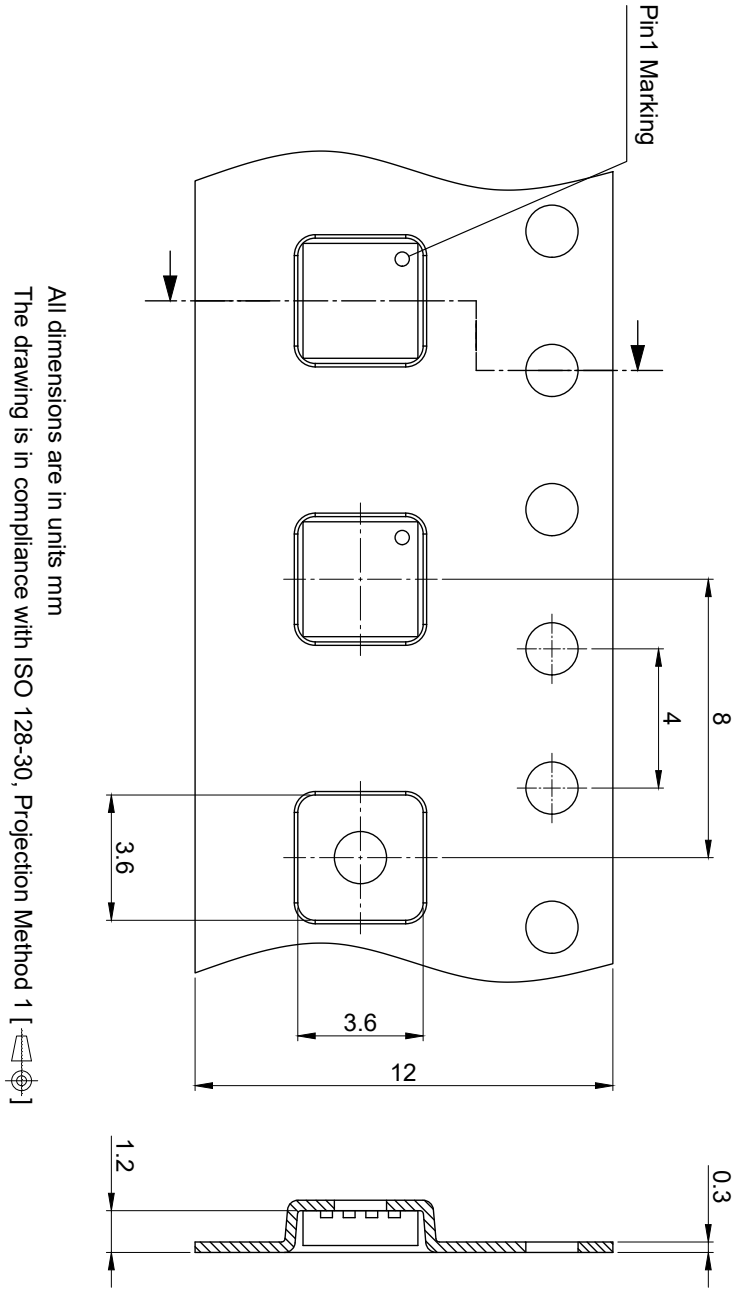


Figure 3 Packaging variant PG-WHTFN-9, dimensions in mm

Revision history

IQEH50NE2LM7UCGSC

Revision 2025-08-05, Rev. 1.0

Previous revisions

Revision	Date	Subjects (major changes since last revision)
1.0	2025-08-05	Release of final datasheet

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
© 2025 Infineon Technologies AG
All Rights Reserved.

Important notice
The products which may also include samples and may be comprised of hardware or software or both ("Product") are sold or provided and delivered by Infineon Technologies AG and its affiliates ("Infineon") subject to the terms and conditions of the frame supply contract or other written agreement(s) executed by a customer and Infineon or, in the absence of the foregoing, the applicable Sales Conditions of Infineon. General terms and conditions of a customer or deviations from applicable Sales Conditions of Infineon shall only be binding for Infineon if and to the extent Infineon has given its express written consent.

For the avoidance of doubt, Infineon disclaims all warranties of non-infringement of third-party rights and implied warranties such as warranties of fitness for a specific use/purpose or merchantability.

Infineon shall not be responsible for any information with respect to samples, the application or customer's specific use of any Product or for any examples or typical values given in this document.

The data contained in this document is exclusively intended for technically qualified and skilled customer representatives. It is the responsibility of the customer to evaluate the suitability of the Product for the intended application and the customer's specific use and to verify all relevant technical data contained in this document in the intended application and the customer's specific use. The customer is responsible for properly designing, programming, and testing the functionality and safety of the intended application, as well as complying with any legal requirements related to its use.

Unless otherwise explicitly approved by Infineon, Products may not be used in any application where a failure of the Product or any consequences of the use thereof can reasonably be expected to result in personal injury. However, the foregoing shall not prevent the customer from using any Product in such fields of use that Infineon has explicitly designed and sold it for, provided that the overall responsibility for the application lies with the customer.

If the Product includes security features:
Because no computing device can be absolutely secure, and despite security measures implemented in the Product, Infineon does not guarantee that the Product will be free from intrusion, data theft or loss, or other breaches ("Security Breaches"), and Infineon shall have no liability arising out of any Security Breaches.

If this document includes or references software:
The software is owned by Infineon under the intellectual property laws and treaties of the United States, Germany, and other countries worldwide. All rights reserved. Therefore, you may use the software only as provided in the software license agreement accompanying the software. If no software license agreement applies, Infineon hereby grants you a personal, non-exclusive, non-transferable license (without the right to sublicense) under its intellectual property rights in the software (a) for software provided in source code form, to modify and reproduce the software solely for use with Infineon hardware products, only internally within your organization, and (b) to distribute the software in binary code form externally to end users, solely for use on Infineon hardware products. Any other use, reproduction, modification, translation, or compilation of the software is prohibited.

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

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.