

MOSFET

PG-TO247-3

650V CoolMOS™ CM8 Power Transistor

The CoolMOS™ 8th generation platform is a revolutionary technology for high voltage power MOSFETs, designed according to the superjunction (SJ) principle and pioneered by Infineon Technologies. The 650V CoolMOS™ CM8 series is the successor to the 650V CoolMOS™ 7 Family and is enhancing Infineon's WBG offering. It combines the benefits of a fast switching SJ MOSFET with excellent ease of use, e.g low ringing tendency, implemented fast body diode (CFD) for all products with outstanding robustness against hard commutation and excellent ESD capability. Furthermore, extremely low switching and conduction losses of CM8, make switching applications even more efficient.

Features

- Best in class 650V SJ MOSFET performance
- Suitable for hard and soft switching topologies thanks to an outstanding commutation ruggedness
- Integrated fast body diode and ESD protection
- .XT interconnection technology for best in class thermal performance

Benefits

- Ease of use and fast design-in through low ringing tendency and usage across PFC and PWM stages
- Simplified thermal management due to our advanced die attach technique
- Increased power density solutions enabled by using products with smaller footprint and higher manufacturing quality due state of the art ESD protection
- Suitable for a wide variety of applications and power ranges

Potential applications

- Power supplies and converters
- PFC stages & LLC resonant converters
- High efficiency switching applications
- e.g. Datacenter, AI Server, Telecom Power Supply

Product validation

Fully qualified according to JEDEC for Industrial Applications

Please note: For MOSFET paralleling the use of ferrite beads on the gate or separate totem poles is generally recommended.

Table 1 Key performance parameters

Parameter	Value	Unit
$V_{DS} @ T_{j,max}$	700	V
$R_{DS(on),max}$	18	mΩ
$Q_{g,typ}$	173	nC
$I_{D,pulse}$	505	A
$E_{oss} @ 400V$	19.6	μJ
Body diode di_F/dt	1300	A/μs
ESD class (HBM)	2	

Part number	Package	Marking	Related links
IPW65R018CM8	PG-TO247-3	65R018C8	see Appendix A

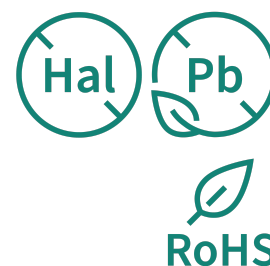
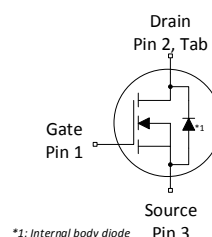
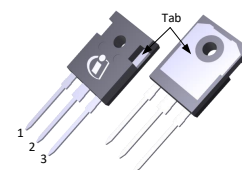




Table of contents

Description 1

Maximum ratings 3

Thermal characteristics 4

Electrical characteristics 5

Electrical characteristics diagrams 7

Test circuits 11

Package outlines 12

Appendix A 13

Revision history 14

Trademarks 15

Disclaimer 15

1 Maximum ratings

at $T_j = 25^\circ\text{C}$, unless otherwise specified

Table 2 Maximum ratings

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Continuous drain current ¹⁾	I_D	-	-	116	A	$T_C = 25^\circ\text{C}$
				73		$T_C = 100^\circ\text{C}$
Pulsed drain current ²⁾	$I_{D,pulse}$	-	-	505	A	$T_C = 25^\circ\text{C}$
Avalanche energy, single pulse	E_{AS}	-	-	297	mJ	$I_D = 6.7\text{A}$; $V_{DD} = 50\text{V}$; see table 10
Avalanche energy, repetitive	E_{AR}			1.48		
Avalanche current, single pulse	I_{AS}	-	-	6.7	A	-
MOSFET dv/dt ruggedness	dv/dt	-	-	120	V/ns	$V_{DS} = 0 \dots 400\text{V}$
Gate source voltage (static)	V_{GS}	-20	-	20	V	static;
Gate source voltage (dynamic)	V_{GS}	-30	-	30	V	AC ($f > 1\text{ Hz}$)
Power dissipation	P_{tot}	-	-	521	W	$T_C = 25^\circ\text{C}$
Storage temperature	T_{stg}	-55	-	150	$^\circ\text{C}$	-
Operating junction temperature	T_j					
Extended operating junction temperature	T_j	150	-	175	$^\circ\text{C}$	$\leq 50\text{ h}$ in the application lifetime
Mounting torque	-	-	-	60	Ncm	M3 and M3.5 screws
Continuous diode forward current	I_S	-	-	116	A	$T_C = 25^\circ\text{C}$
Diode pulse current ²⁾	$I_{S,pulse}$			505		
Reverse diode dv/dt ³⁾	dv/dt	-	-	70	V/ns	$V_{DS} = 0 \dots 400\text{V}$, $I_{SD} \leq 116\text{A}$, $T_j = 25^\circ\text{C}$ see table 8
Maximum diode commutation speed	di _F /dt			1300	A/ μs	
Insulation withstand voltage	V_{ISO}	-	-	n.a.	V	V_{rms} , $T_C = 25^\circ\text{C}$, $t = 1\text{min}$

¹⁾ Limited by $T_{j,max}$

²⁾ Pulse width t_p limited by $T_{j,max}$

³⁾ Identical low side and high side switch with identical R_G

2 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	0.24	K/W	-
Thermal resistance, junction - ambient	R_{thJA}	-	-	62	K/W	leaded
Thermal resistance, junction - ambient for SMD version	R_{thJA}	-	-	-	K/W	-
Soldering temperature, wavesoldering only allowed at leads	T_{sold}	-	-	260	°C	1.6mm (0.063 in.) from case for 10s

3 Electrical characteristics

at $T_j=25^\circ\text{C}$, unless otherwise specified

Table 4 Static characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Drain-source breakdown voltage	$V_{(BR)DSS}$	650	-	-	V	$V_{GS}=0V$, $I_D=1mA$
Gate threshold voltage	$V_{(GS)th}$	3.7	4.2	4.7	V	$V_{DS}=V_{GS}$, $I_D=1.48mA$
Zero gate voltage drain current	I_{DSS}	-	-	2	μA	$V_{DS}=650V$, $V_{GS}=0V$, $T_j=25^\circ\text{C}$
			244	-		$V_{DS}=650V$, $V_{GS}=0V$, $T_j=150^\circ\text{C}$
Gate-source leakage current	I_{GSS}	-	-	0.1	μA	$V_{GS}=20V$, $V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	0.015	0.018	Ω	$V_{GS}=10V$, $I_D=55.6A$, $T_j=25^\circ\text{C}$
			0.033	-		$V_{GS}=10V$, $I_D=55.6A$, $T_j=150^\circ\text{C}$
Gate resistance	R_G	-	1	-	Ω	$f=1MHz$

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Input capacitance	C_{iss}	-	8290	-	pF	$V_{GS}=0V$, $V_{DS}=400V$, $f=250kHz$
Output capacitance	C_{oss}		91			
Effective output capacitance, energy related ⁴⁾	$C_{o(er)}$	-	245	-	pF	$V_{GS}=0V$, $V_{DS}=0...400V$
Effective output capacitance, time related ⁵⁾	$C_{o(tr)}$	-	2702	-	pF	$I_D=\text{constant}$, $V_{GS}=0V$, $V_{DS}=0...400V$
Turn-on delay time	$t_{d(on)}$	-	44.5	-	ns	$V_{DD}=400V$, $V_{GS}=13V$, $I_D=29.7A$, $R_G=1.8\Omega$; see table 9
Rise time	t_r		16.1			
Turn-off delay time	$t_{d(off)}$		159.2			
Fall time	t_f		5.1			

⁴⁾ $C_{o(er)}$ is a fixed capacitance that gives the same stored energy as C_{oss} while V_{DS} is rising from 0 to 400V

⁵⁾ $C_{o(tr)}$ is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 400V

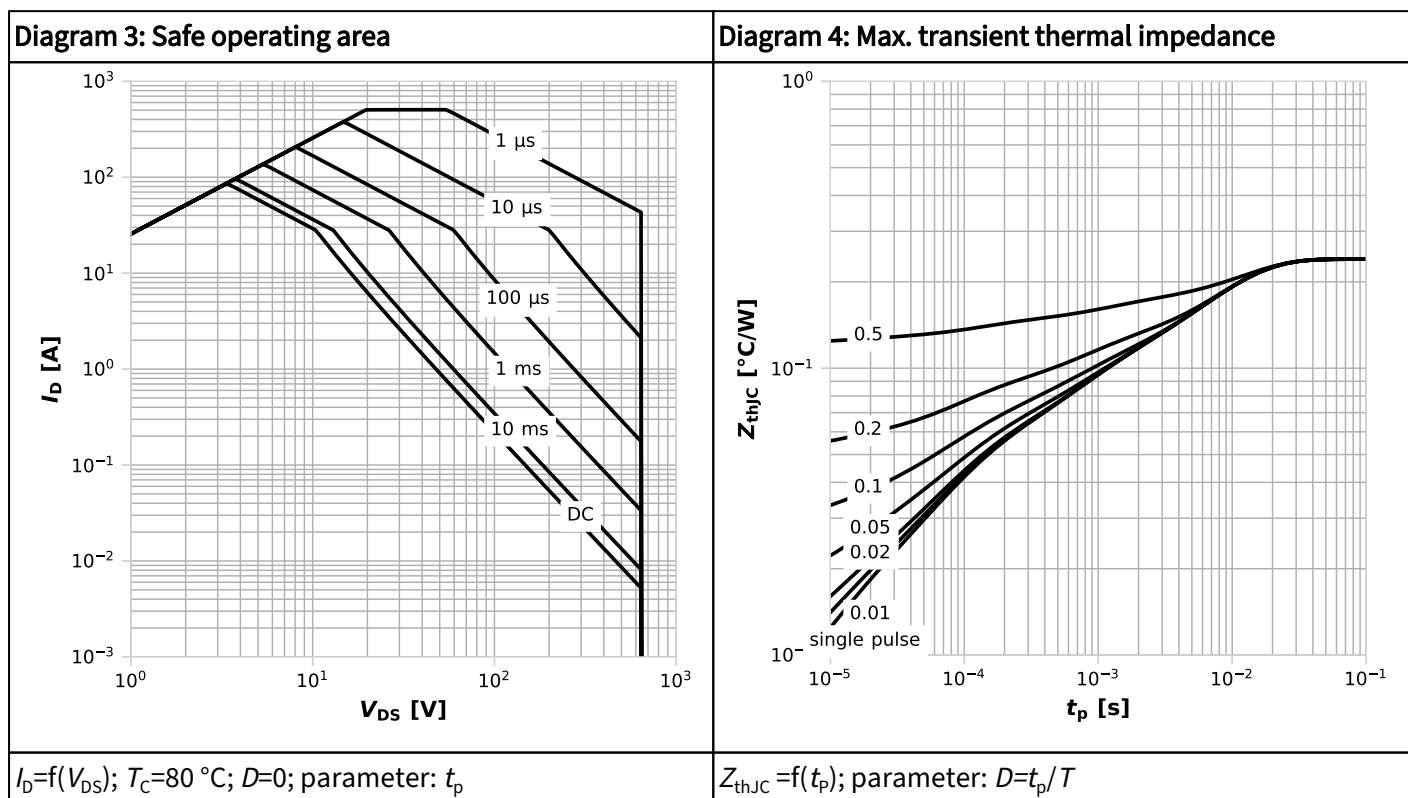
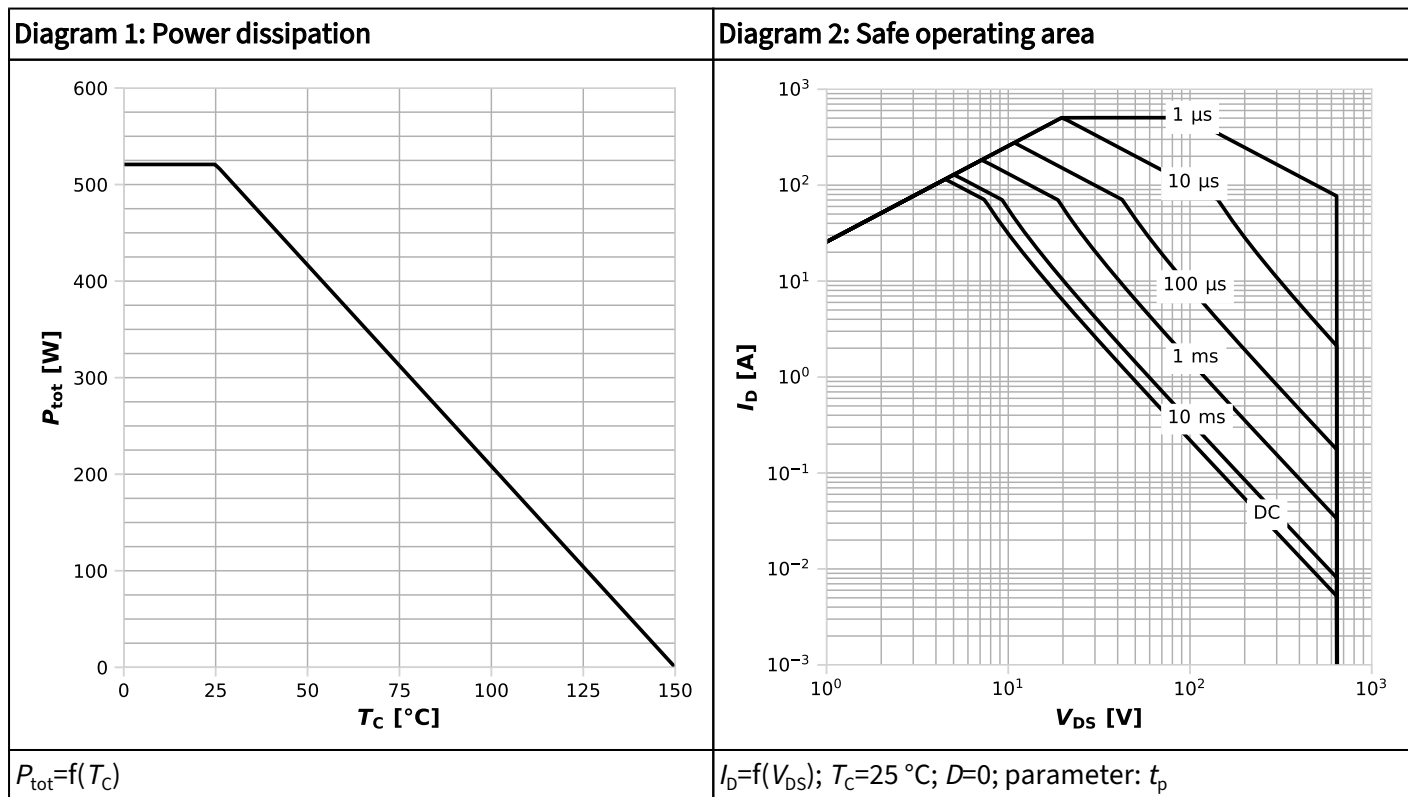
Table 6 Gate charge characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Gate to source charge	Q_{gs}	-	48	-	nC	$V_{DD}=400V$, $I_D=29.7A$, $V_{GS}=0$ to $10V$
Gate to drain charge	Q_{gd}		54		nC	
Gate charge total	Q_g		173		nC	
Gate plateau voltage	$V_{plateau}$		5.8		V	

Table 7 Reverse diode characteristics

Parameter	Symbol	Values			Unit	Note / Test condition
		Min.	Typ.	Max.		
Diode forward voltage	V_{SD}	-	0.9	-	V	$V_{GS}=0V$, $I_F=29.7A$, $T_j=25^\circ C$
Reverse recovery time	t_{rr}	-	180	225	ns	$V_R=400V$, $I_F=29.7A$, $di_F/dt=100A/\mu s$; see table 8
Reverse recovery charge	Q_{rr}		1.54	2.31	μC	
Peak reverse recovery current	I_{rrm}		16.4	-	A	

4 Electrical characteristics diagrams



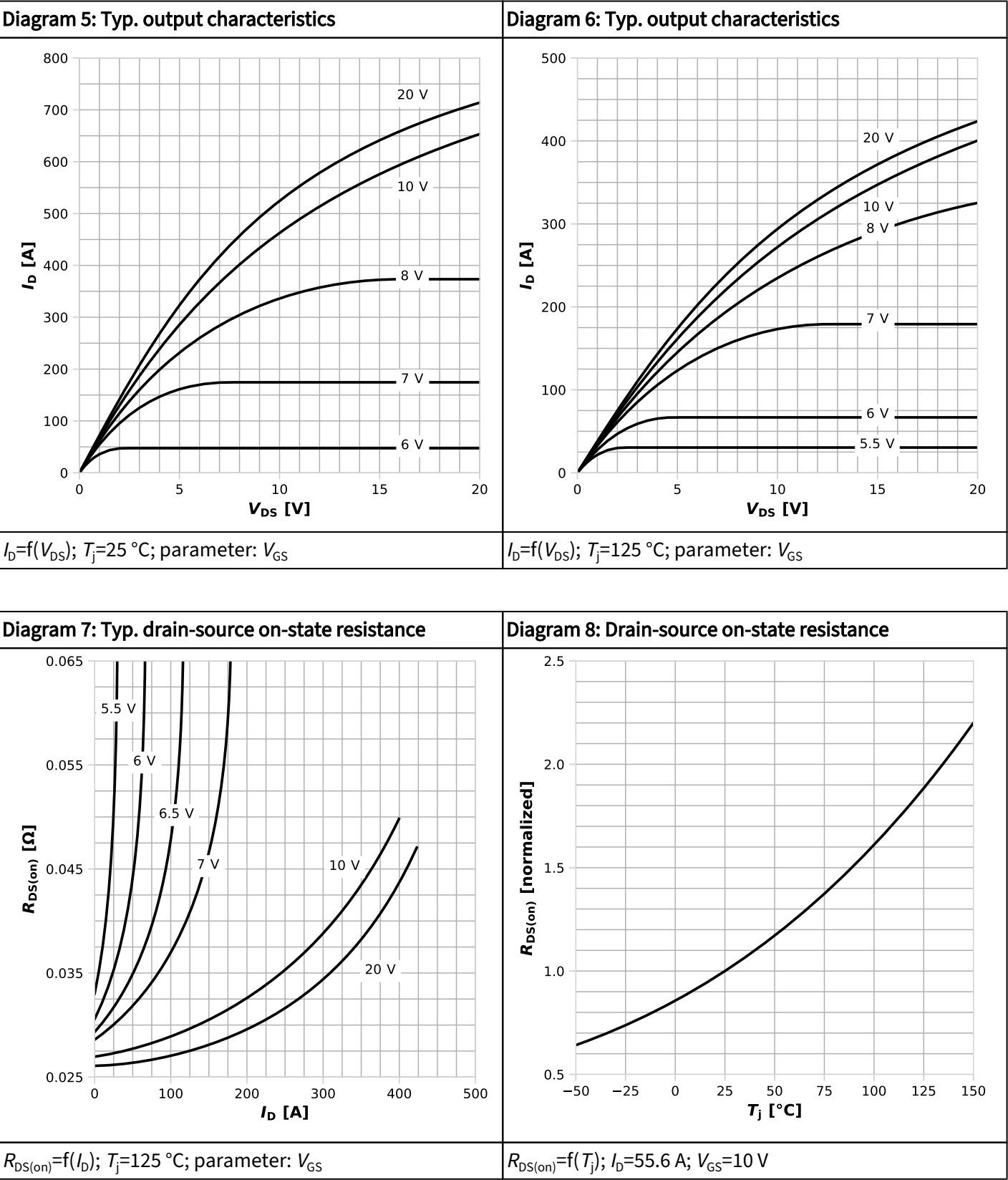
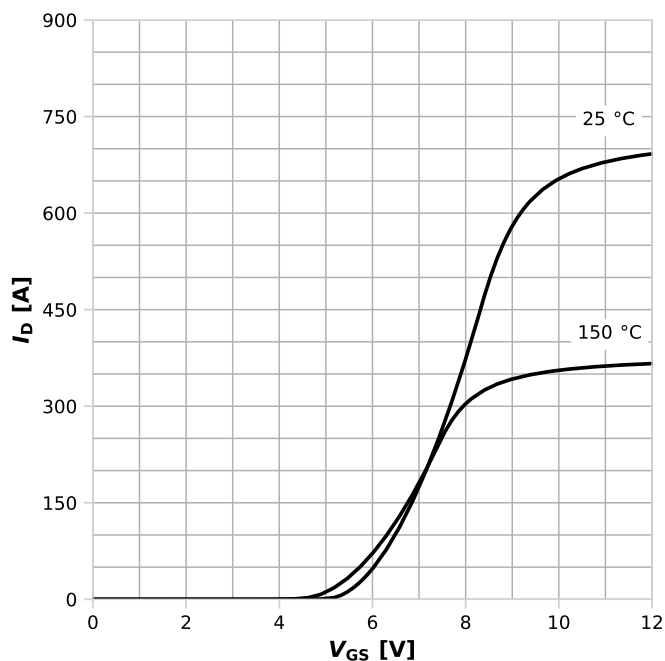
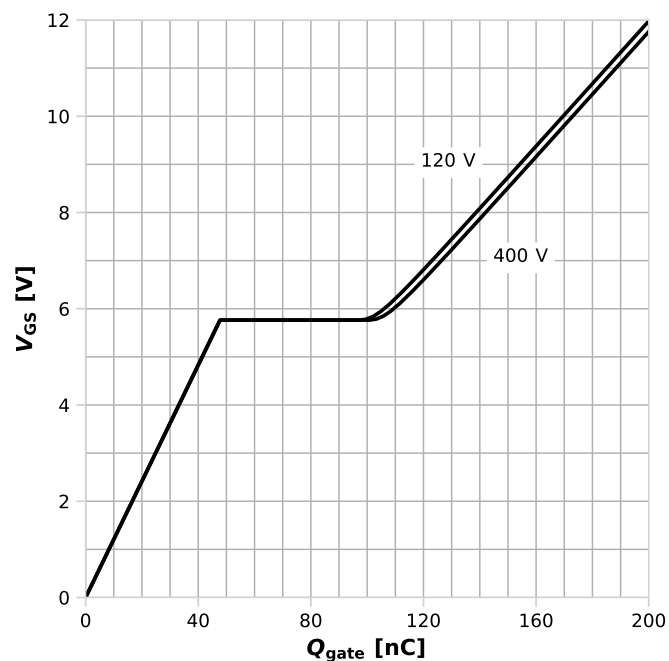


Diagram 9: Typ. transfer characteristics



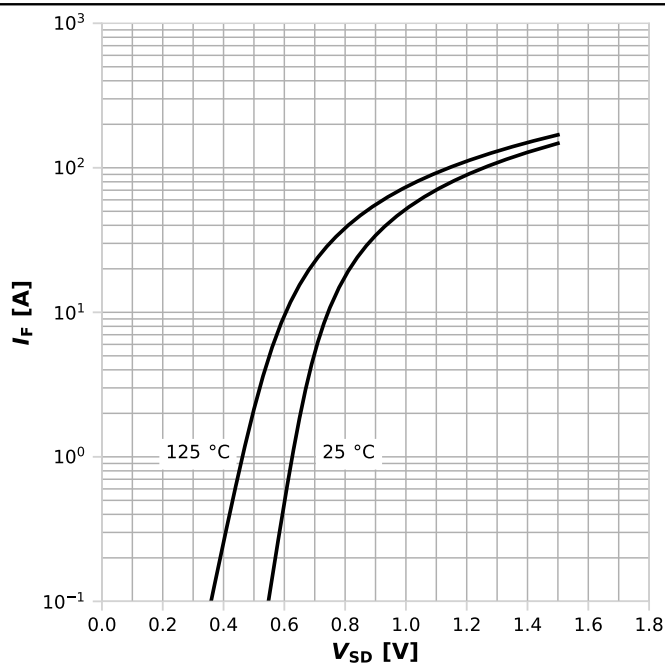
$I_D = f(V_{GS})$; $V_{DS} = 20V$; parameter: T_j

Diagram 10: Typ. gate charge



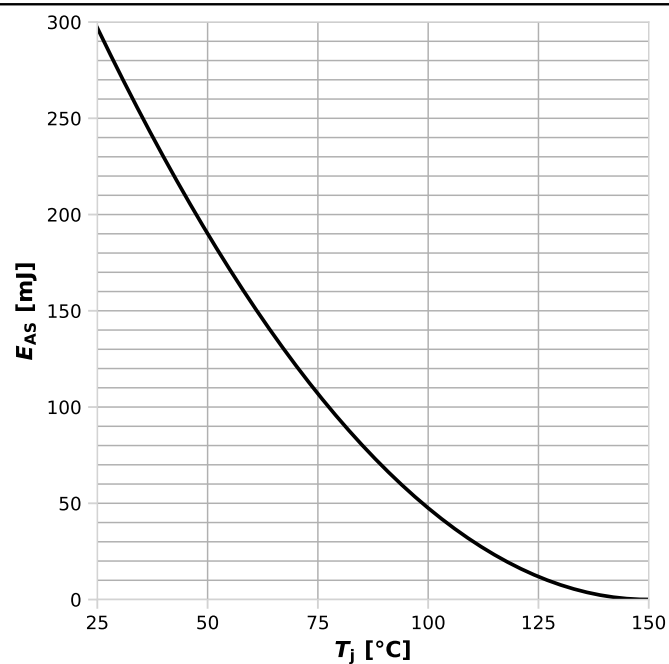
$V_{GS} = f(Q_{gate})$; $I_D = 29.7$ A pulsed; parameter: V_{DD}

Diagram 11: Forward characteristics of reverse diode



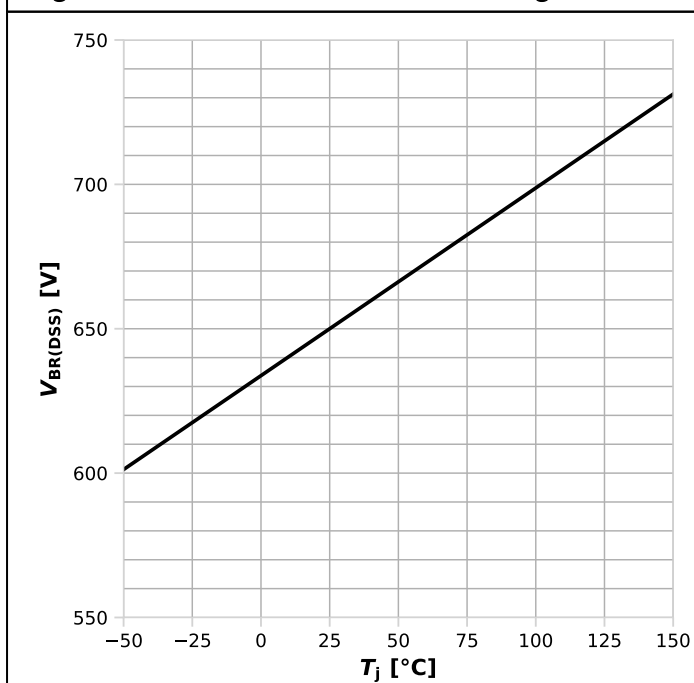
$I_F = f(V_{SD})$; parameter: T_j

Diagram 12: Avalanche energy



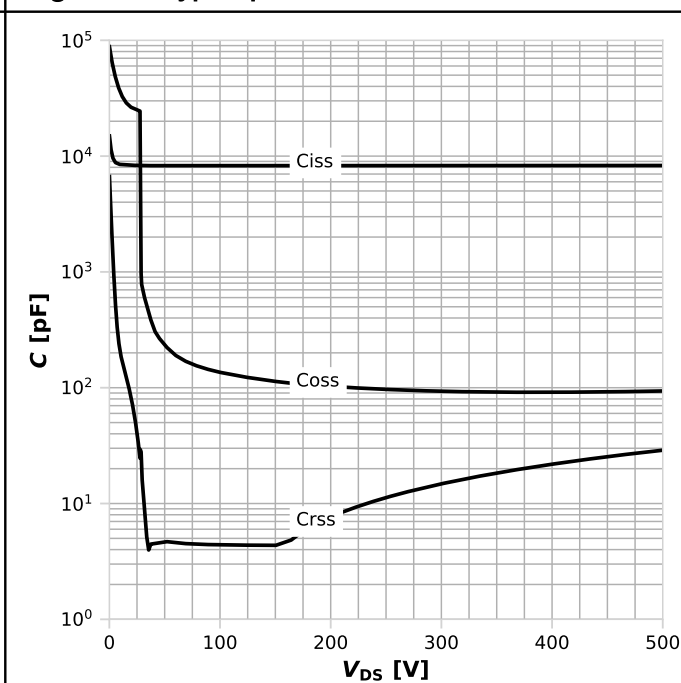
$E_{AS} = f(T_j)$; $I_D = 6.7$ A; $V_{DD} = 50$ V

Diagram 13: Drain-source breakdown voltage



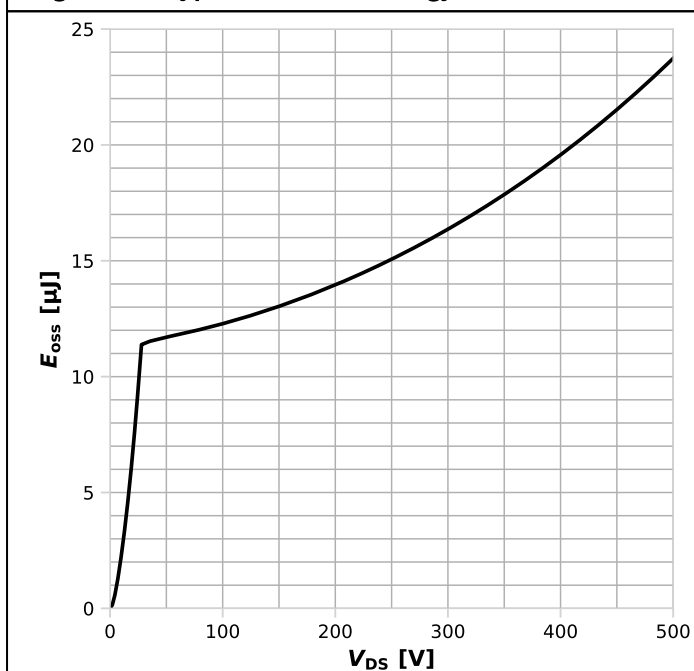
$$V_{BR(DSS)} = f(T_j); I_D = 10 \text{ mA}$$

Diagram 14: Typ. capacitances



$$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 250 \text{ kHz}$$

Diagram 15: Typ. Coss stored energy



$$E_{oss} = f(V_{DS})$$

5 Test circuits

Table 8 Diode characteristics

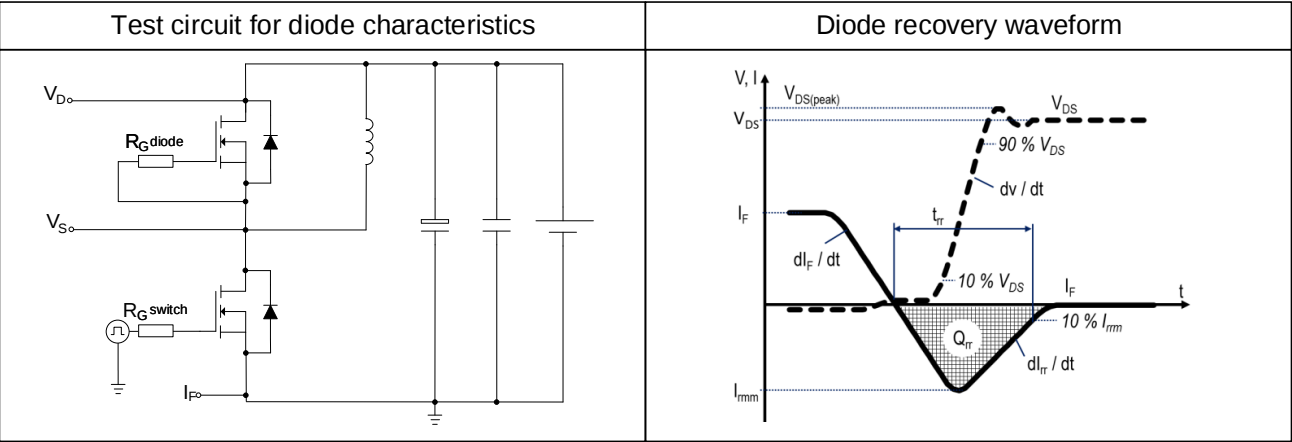


Table 9 Switching times

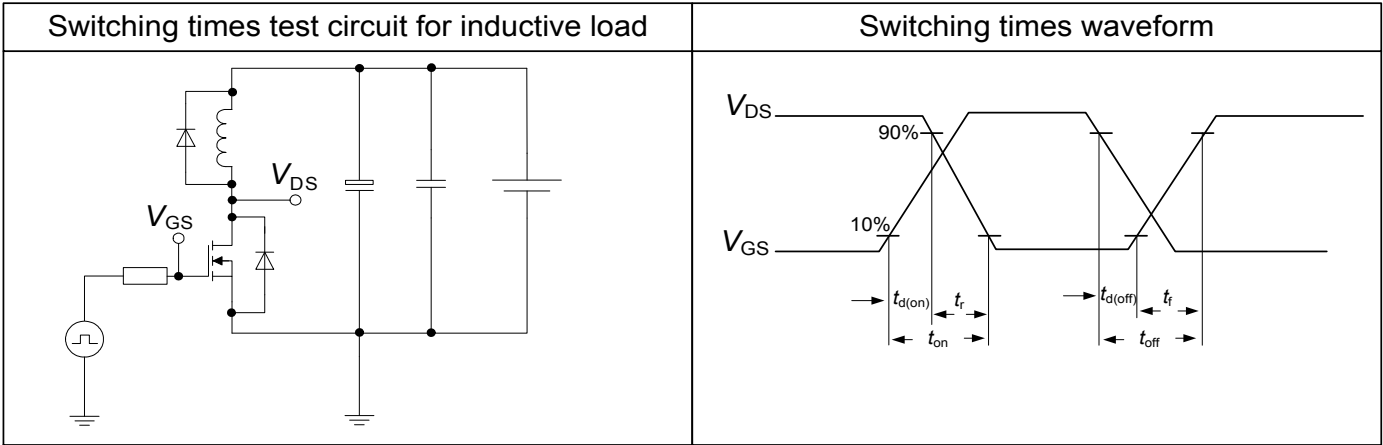
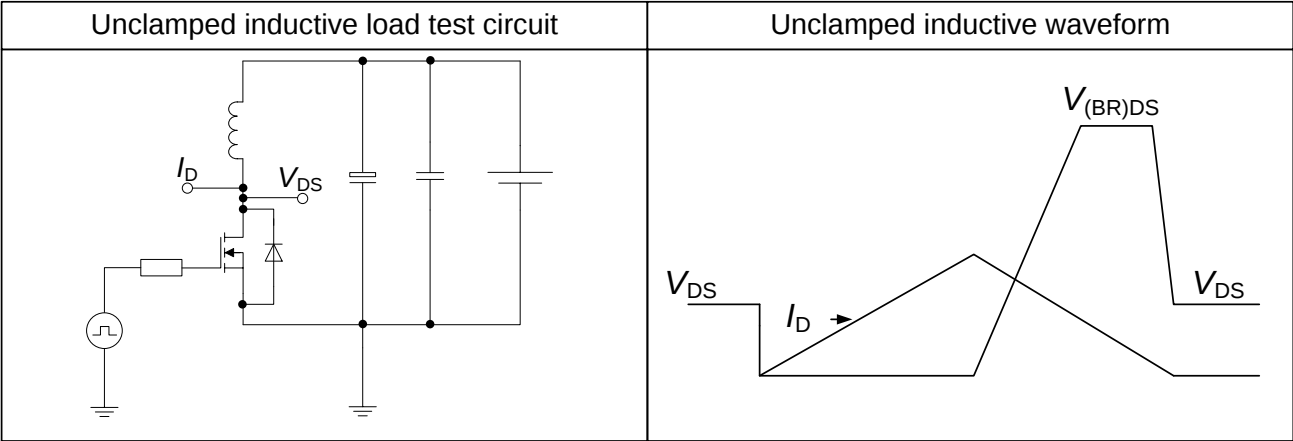


Table 10 Unclamped inductive load



6 Package outlines

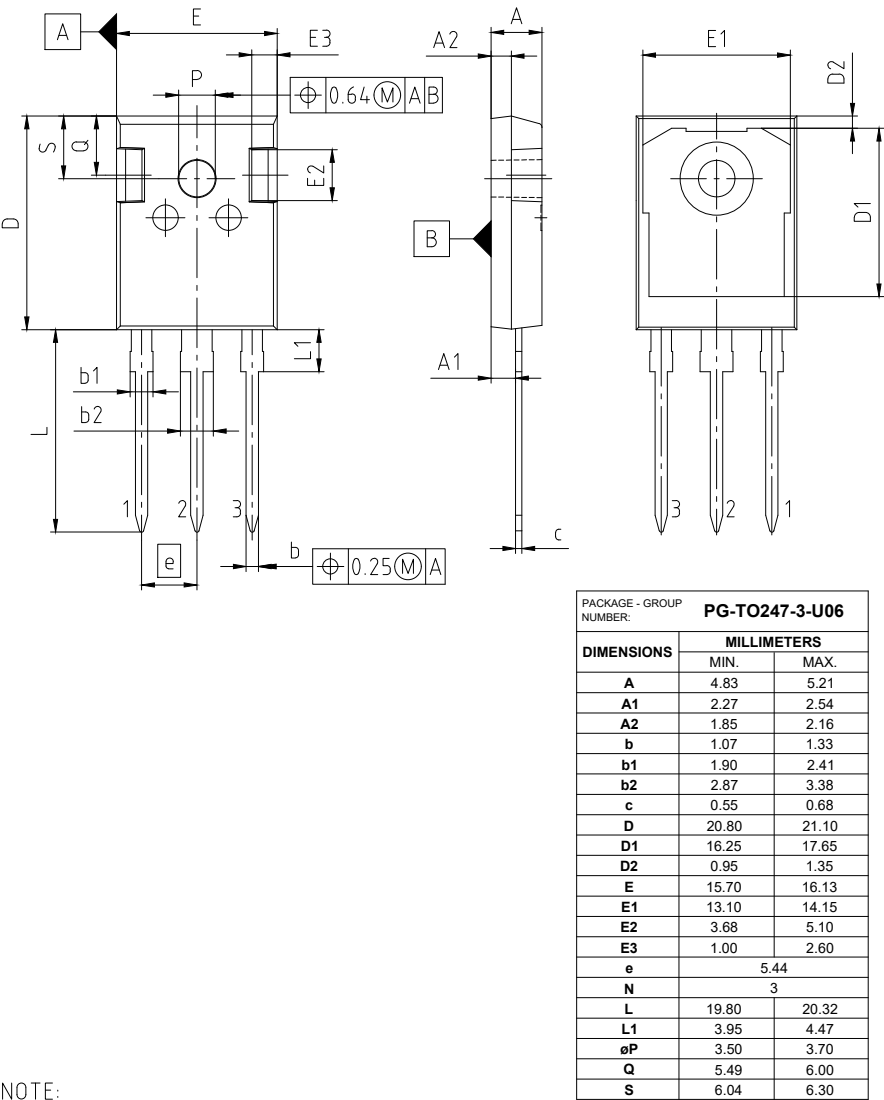


Figure 1 Outline PG-T0247-3, dimensions in mm

7 Appendix A

Table 11 **Related links**

- [IFX CoolMOS CM8 Webpage](#)
- [IFX CoolMOS CM8 application note](#)
- [IFX CoolMOS CM8 simulation model](#)
- [IFX Design tools](#)

Revision history

IPW65R018CM8

Revision 2025-03-07, Rev. 2.1

Previous revisions

Revision	Date	Subjects (major changes since last revision)
2.0	2024-12-19	Release of final version
2.1	2025-03-07	Update of maximum transient thermal impedance and SOA

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).

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [MOSFETs](#) category:

Click to view products by [Infineon](#) manufacturer:

Other Similar products are found below :

[MCH3443-TL-E](#) [MCH6422-TL-E](#) [PMV32UP215](#) [NTNS3A92PZT5G](#) [2SK2464-TL-E](#) [2SK3818-DL-E](#) [2SJ277-DL-E](#) [2SK2267\(Q\)](#)
[AON6932A](#) [TS19452CS RL](#) [EFC2J004NUZTDG](#) [743-9](#) [US6M2GTR](#) [IRF40H233XTMA1](#) [STU5N65M6](#) [DMN13M9UCA6-7](#)
[STU7N60DM2](#) [2N7002W-G](#) [NTMFS006N08MC](#) [NTTFS5C680NLTAG](#) [IPB45P03P4L11ATMA2](#) [NVTFS6H880NLWFTAG](#)
[NTMC083NP10M5L](#) [NTTFS022N15MC](#) [NVMFS5C420NLWFT1G](#) [BXP4N65F](#) [BXP2N20L](#) [BXP2N65D](#) [NTD5C632NLT4G](#)
[NTMYS2D1N04CLTWG](#) [NVD360N65S3T4G](#) [NVMTS1D1N04CTXG](#) [CJAC130SN06L](#) [HSBA6054](#) [HSBB6054](#) [HSBB0210](#) [HSBB0056](#)
[HSBA6901](#) [BSC004NE2LS5](#) [BSZ075N08NS5](#) [LBSS138DW1T1G](#) [AP0903G](#) [SSM10N954L,EFF\(S](#) [2SK3878\(STA1,E,S\)](#)
[TPN6R303NC,LQ\(S](#) [AP3N5R0MT](#) [AP6NA3R2MT](#) [AP3C023AMT](#) [AP6242](#) [HSBB3909](#)