

MOSFET

OptiMOS[™]5 Power-Transistor, 80 V

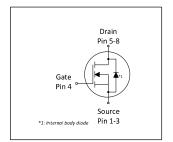
Features

- Ideal for high frequency switching and sync. rec.
 Optimized technology for DC/DC converters
 Excellent gate charge x R_{DS(on)} product (FOM)
 Very low on-resistance R_{DS(on)}
- N-channel, normal level
- 100% avalanche tested
- Pb-free plating; RoHS compliant
 Qualified according to JEDEC¹⁾ for target applications
 Halogen-free according to IEC61249-2-21
- Higher solder joint reliability with enlarged source interconnection

Table 1 **Key Performance Parameters**

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Parameter	Value	Unit					
V _{DS}	80	V					
$R_{DS(on),max}$	11.0	m $Ω$					
I _D	51	A					
Qoss	19	nC					
Q _G (0V10V)	15	nC					











Type / Ordering Code	Package	Marking	Related Links
BSZ110N08NS5	PG-TSDSON-8 FL	110N08N	-



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1 Maximum ratings at T_A =25 °C, unless otherwise specified

Table 2 **Maximum ratings**

D	C	Values				
Parameter	Symbol	Min.	Тур.	Max.	Unit	Note / Test Condition
Continuous drain current ¹⁾	ID	-	-	51 33	А	T _C =25 °C T _C =100 °C
Pulsed drain current ²⁾	I _{D,pulse}	-	-	204	Α	T _C =25 °C
Avalanche energy, single pulse ³⁾	E _{AS}	-	-	40	mJ	I_D =20 A, R_{GS} =25 Ω
Gate source voltage	V _{GS}	-20	-	20	V	-
Power dissipation	P _{tot}	-	-	50	W	T _C =25 °C
Operating and storage temperature	T _j , T _{stg}	-55	-	150	°C	IEC climatic category; DIN IEC 68-1: 55/150/56

2 Thermal characteristics

Thermal characteristics Table 3

Davameter	Cumbal	Values			l lmi4	Note / Test Condition
Parameter	Symbol	Min.	Тур.	Max.	Unit	Note / Test Condition
Thermal resistance, junction - case	R_{thJC}	-	1.5	2.5	K/W	-
Device on PCB, 6 cm ² cooling area ⁴⁾	R _{thJA}	_	_	60	K/W	-

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) See Diagram 3 for more detailed information
3) See Diagram 13 for more detailed information

 $^{^{4)}}$ Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (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**

Damamatan.	Cumala al		Values			N
Parameter	Symbol	Min.	Тур.	Max.	Unit	Note / Test Condition
Drain-source breakdown voltage	$V_{(BR)DSS}$	80	-	-	V	V _{GS} =0 V, I _D =1 mA
Gate threshold voltage	$V_{\rm GS(th)}$	2.2	3	3.8	V	$V_{\rm DS}=V_{\rm GS},\ I_{\rm D}=22\ \mu{\rm A}$
Zero gate voltage drain current	I _{DSS}	-	0.1 10	1 100	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}	-	1	100	nA	V _{GS} =20 V, V _{DS} =0 V
Drain-source on-state resistance	R _{DS(on)}	-	9.6 13.4	11.0 16.3	mΩ	V _{GS} =10 V, I _D =20 A V _{GS} =6 V, I _D =5 A
Gate resistance	R _G	-	1.4	2	Ω	-
Transconductance	g_{fs}	17	33	-	S	$ V_{DS} > 2 I_D R_{DS(on)max}, I_D = 20 \text{ A}$

 Table 5
 Dynamic characteristics

Davamatav	Symbol	Values			11:4	Note / Test Condition
Parameter	Symbol	Min.	Тур.	Max.	Unit	Note / Test Condition
Input capacitance ¹⁾	C _{iss}	-	1000	1300	pF	V _{GS} =0 V, V _{DS} =40 V, f=1 MHz
Output capacitance ¹⁾	Coss	-	180	235	pF	V _{GS} =0 V, V _{DS} =40 V, f=1 MHz
Reverse transfer capacitance ¹⁾	C _{rss}	-	11	19	pF	V _{GS} =0 V, V _{DS} =40 V, f=1 MHz
Turn-on delay time	$t_{\sf d(on)}$	-	9	-	ns	V_{DD} =40 V, V_{GS} =10 V, I_{D} =20 A, $R_{G,ext}$ =1.6 Ω
Rise time	t _r	-	3	-	ns	$V_{\rm DD}$ =40 V, $V_{\rm GS}$ =10 V, $I_{\rm D}$ =20 A, $R_{\rm G,ext}$ =1.6 Ω
Turn-off delay time	$t_{ m d(off)}$	-	15	-	ns	V_{DD} =40 V, V_{GS} =10 V, I_{D} =20 A, $R_{G,ext}$ =1.6 Ω
Fall time	t _f	-	3	-	ns	V_{DD} =40 V, V_{GS} =10 V, I_{D} =20 A, $R_{G,ext}$ =1.6 Ω

Gate charge characteristics²⁾ Table 6

Parameter	Cymah al		Values			Note / Test Condition
	Symbol	Min.	Тур.	Max.	Unit	Note / Test Condition
Gate to source charge	$Q_{ m gs}$	-	4.9	-	nC	$V_{\rm DD}$ =40 V, $I_{\rm D}$ =20 A, $V_{\rm GS}$ =0 to 10 V
Gate to drain charge ¹⁾	$Q_{ m gd}$	-	3.3	5	nC	$V_{\rm DD}$ =40 V, $I_{\rm D}$ =20 A, $V_{\rm GS}$ =0 to 10 V
Switching charge	Q _{sw}	-	5.4	-	nC	$V_{\rm DD}$ =40 V, $I_{\rm D}$ =20 A, $V_{\rm GS}$ =0 to 10 V
Gate charge total ¹⁾	Qg	-	15	18.5	nC	$V_{\rm DD}$ =40 V, $I_{\rm D}$ =20 A, $V_{\rm GS}$ =0 to 10 V
Gate plateau voltage	V _{plateau}	-	4.9	-	V	$V_{\rm DD}$ =40 V, $I_{\rm D}$ =20 A, $V_{\rm GS}$ =0 to 10 V
Gate charge total, sync. FET	$Q_{g(sync)}$	-	13	-	nC	V _{DS} =0.1 V, V _{GS} =0 to 10 V
Output charge ¹⁾	Qoss	-	19	26	nC	V _{DD} =40 V, V _{GS} =0 V
	•	•	•	•	•	•

Defined by design. Not subject to production test Description See "gate charge waveforms" for parameter definition



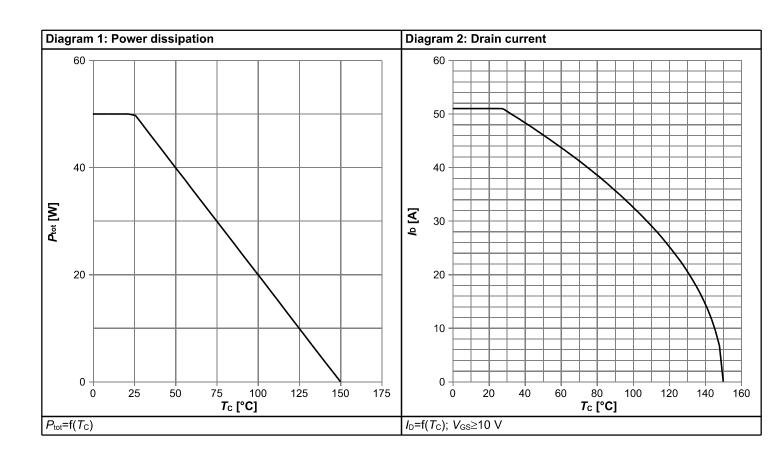
Table 7 Reverse diode

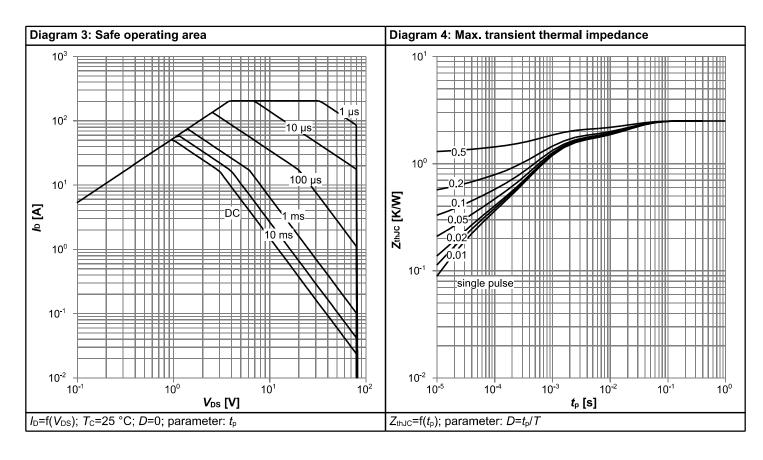
Parameter	Cumbal	Values			11:4	Nata / Tast Candition
	Symbol	Min.	Тур.	Max.	Unit	Note / Test Condition
Diode continous forward current	Is	-	-	41	Α	T _C =25 °C
Diode pulse current	I _{S,pulse}	-	-	204	Α	T _C =25 °C
Diode forward voltage	$V_{ ext{SD}}$	-	0.88	1.2	V	V _{GS} =0 V, I _F =20 A, T _j =25 °C
Reverse recovery time ¹⁾	t _{rr}	-	36	72	ns	V _R =40 V, I _F =20 A, d <i>i</i> _F /d <i>t</i> =100 A/μs
Reverse recovery charge ¹⁾	Q _{rr}	-	36	72	nC	V _R =40 V, I _F =20 A, d <i>i</i> _F /d <i>t</i> =100 A/μs

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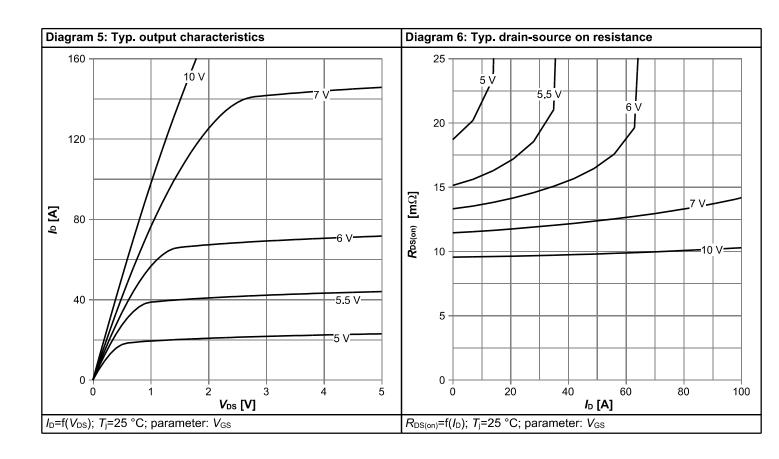


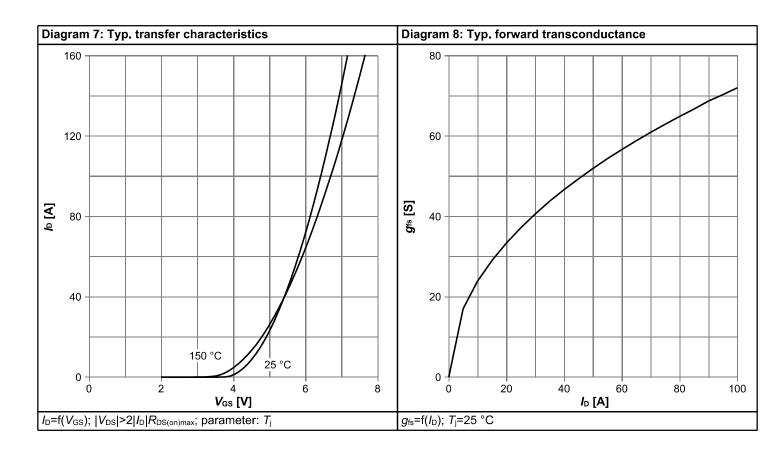
4 Electrical characteristics diagrams



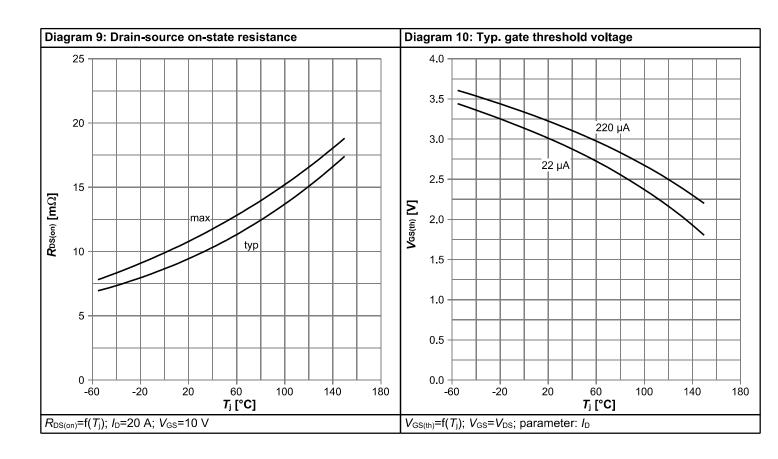


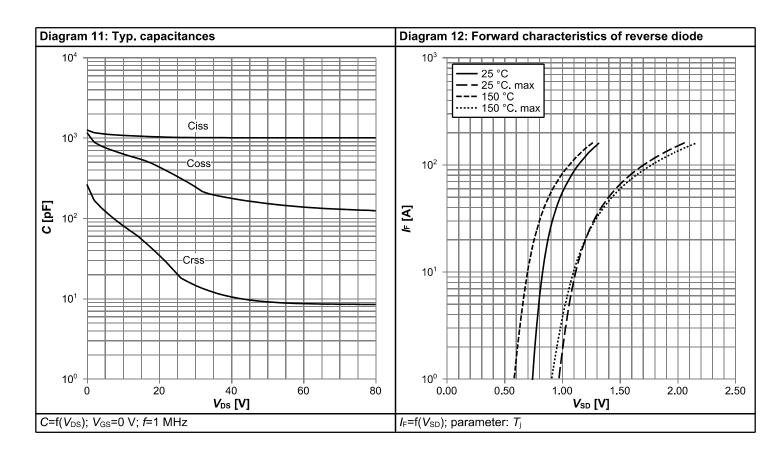




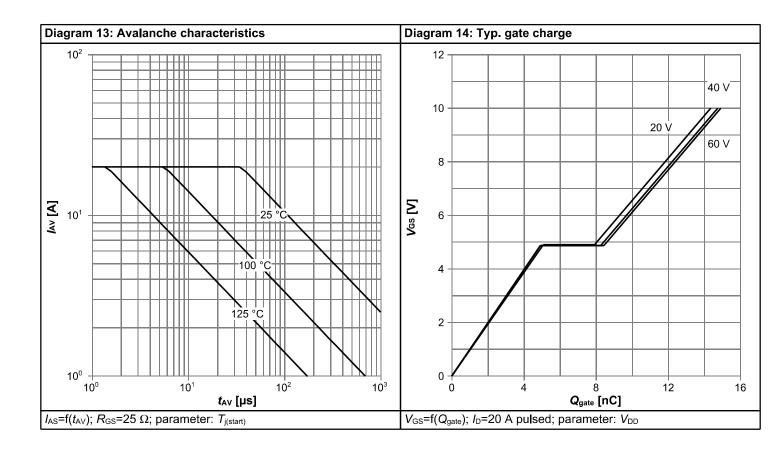


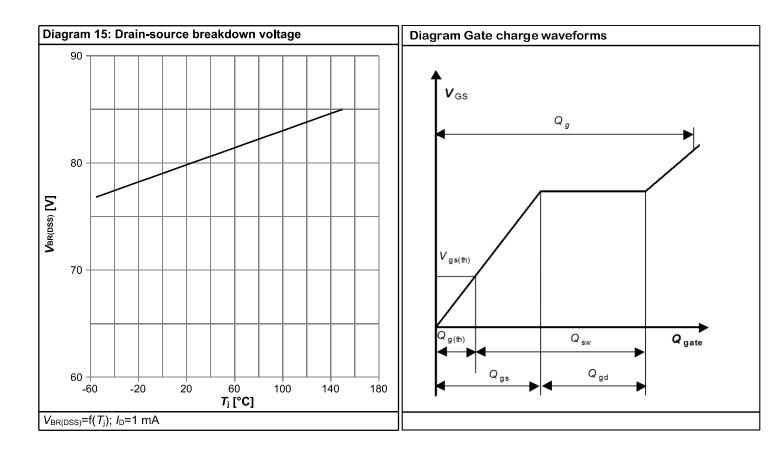






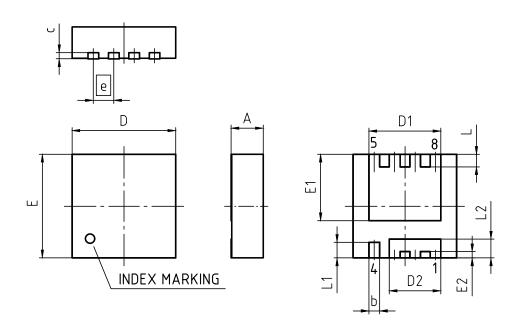








5 Package Outlines



PACKAGE - GROUP NUMBER:	PG-TSDS	PG-TSDSON-8-U03				
REVISION: 03	DATE:	20.10.2020				
DIMENSIONS	MILLIM	ETERS				
DIMENSIONS	MIN.	MAX.				
Α	0.90	1.10				
b	0.24	0.44				
С	(0.	20)				
D	3.20	3.40				
D1	2.19	2.39				
D2	1.54	1.74				
E	3.20	3.40				
E1	2.01	2.21				
E2	0.10	0.30				
е	0.65					
L	0.30	0.50				
L1	0.40	0.60				
L2	0.50	0.70				
aaa	0.0)6				

Figure 1 Outline PG-TSDSON-8 FL, dimensions in mm



Revision History

BSZ110N08NS5

Revision: 2021-02-09, Rev. 2.3

Previous Revision

Revision	Date	Subjects (major changes since last revision)
2.1	2014-05-05	Release of Final Version
2.2	2020-11-09	Update package drawing and footnotes
2.3	2021-02-09	Update Max Id current rating

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