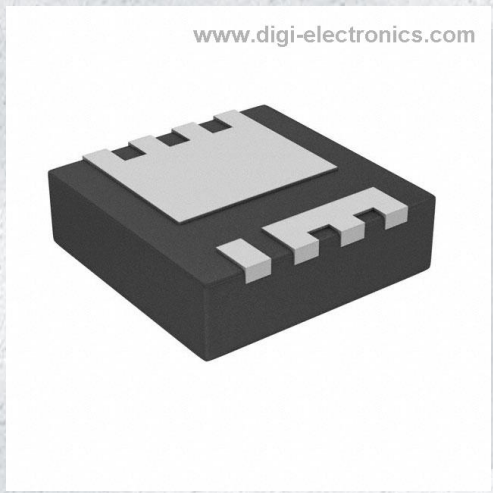
BSZ018NE2LSIATMA1 Datasheet



DiGi Electronics Part Number	BSZ018NE2LSIATMA1-DG
Manufacturer	Infineon Technologies
Manufacturer Product Number	BSZ018NE2LSIATMA1
Description	MOSFET N-CH 25V 22A/40A TSDSON
Detailed Description	N-Channel 25 V 22A (Ta), 40A (Tc) 2.1W (Ta), 69W (Tc) Surface Mount PG-TSDSON-8-FL

https://www.DiGi-Electronics.com

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
BSZ018NE2LSIATMA1	Infineon Technologies
Series:	Product Status:
OptiMOS™	Active
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
25 V	22A (Ta), 40A (Tc)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
4.5V, 10V	1.8mOhm @ 20A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
2V @ 250µA	36 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±20V	2500 pF @ 12 V
FET Feature:	Power Dissipation (Max):
-	2.1W (Ta), 69W (Tc)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
PG-TSDSON-8-FL	8-PowerTDFN
Base Product Number:	
BSZ018	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0095	

BSZ018NE2LSI

MOSFET

OptiMOS™ Power-MOSFET, 25 V

TSDSON-8 FL (S3O8)

Features

- Optimized for high performance Buck converter
- Monolithic integrated Schottky like diode
- Very low on-resistance $R_{DS(on)}$ @ V_{GS}=4.5 V
- 100% avalanche tested
- N-channel
- Qualified according to JEDEC[1] for target applications
- Pb-free lead plating; RoHS compliant
- Halogen-free according to IEC61249-2-21

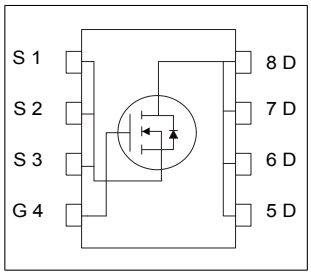


Table 1 Key Performance Parameters

Parameter	Value	Unit
V_{DS}	25	V
$R_{DS(on),max}$	1.8	mΩ
I_D	153	A
Q_{OSS}	23	nC
Q_G(0V..10V)	36	nC

Type / Ordering Code	Package	Marking	Related Links
BSZ018NE2LSI	PG-TSDSON-8 FL	018NE2I	-

[1] J-STD20 and JESD22

OptiMOS™ Power-MOSFET, 25 V

BSZ018NE2LSI

Table of Contents

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	- - - - -	- - - - -	153 97 130 82 22	A	V_{GS}=10 V, T_C=25 °C V_{GS}=10 V, T_C=100 °C V_{GS}=4.5 V, T_C=25 °C V_{GS}=4.5 V, T_C=100 °C V_{GS}=4.5 V, T_A=25 °C, R_{thJA}=60 K/W[2]
Pulsed drain current[3]	$I_{D,pulse}$	-	-	612	A	T_C=25 °C
Avalanche current, single pulse[4]	I_{AS}	-	-	20	A	T_C=25 °C
Avalanche energy, single pulse	E_{AS}	-	-	80	mJ	I_D=20 A, R_{GS}=25 Ω
Gate source voltage	V_{GS}	-20	-	20	V	-
Power dissipation	P_{tot}	- -	- -	69 2.1	W	T_C=25 °C T_A=25 °C, R_{thJA}=60 K/W[2]
Operating and storage temperature	T_j, T_{stg}	-55	-	150	°C	IEC climatic category; DIN IEC 68-1: 55/150/56

2 Thermal characteristics

Table 3 Thermal characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Thermal resistance, junction - case	R_{thJC}	-	-	1.8	K/W	-
Device on PCB, 6 cm^2 cooling area[2]	R_{thJA}	-	-	60	K/W	-

[1] Rating refers to the product only with datasheet specified absolute maximum values, maintaining case temperature at 25°C. For higher case temperature 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 cm2 (one layer, 70 µm thick) copper area for drain connection. PCB is vertical in still air.
[3] >See figure 3 for more detailed information
[4] See figure 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	$V_{(BR)DSS}$	25	-	-	V	V_{GS}=0 V, I_D=10 mA
Breakdown voltage temperature coefficient	$dV_{(BR)DSS}/dT_j$	-	15	-	mV/K	I_D=10 mA, referenced to 25 °C
Gate threshold voltage	$V_{GS(th)}$	1.2	-	2.0	V	V_{DS}=V_{GS}, I_D=250 µA
Zero gate voltage drain current	I_{DSS}	- -	- 2	0.5 -	mA	V_{DS}=20 V, V_{GS}=0 V, T_j=25 °C V_{DS}=20 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	$R_{DS(on)}$	- -	2.0 1.5	2.5 1.8	mΩ	V_{GS}=4.5 V, I_D=20 A V_{GS}=10 V, I_D=20 A
Gate resistance	R_G	0.4	0.8	1.6	Ω	-
Transconductance	g_{fs}	50	100	-	S	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=20 A

Table 5 Dynamic characteristics

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Input capacitance[1)]	C_{iss}	-	2500	3400	pF	V_{GS}=0 V, V_{DS}=12 V, f=1 MHz
Output capacitance[1)]	C_{oss}	-	1100	1500	pF	V_{GS}=0 V, V_{DS}=12 V, f=1 MHz
Reverse transfer capacitance	C_{rss}	-	110	-	pF	V_{GS}=0 V, V_{DS}=12 V, f=1 MHz
Turn-on delay time	$t_{d(on)}$	-	5.2	-	ns	V_{DD}=12 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Rise time	t_r	-	4.8	-	ns	V_{DD}=12 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Turn-off delay time	$t_{d(off)}$	-	25	-	ns	V_{DD}=12 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω
Fall time	t_f	-	3.6	-	ns	V_{DD}=12 V, V_{GS}=10 V, I_D=30 A, $R_{G,ext}$=1.6 Ω

[1)] Defined by design. Not subject to production test

Table 6 Gate charge characteristics[1)]

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Gate to source charge[2)]	Q_{gs}	-	6.3	8.4	nC	V_{DD}=12 V, I_D=30 A, V_{GS}=0 to 4.5 V
Gate charge at threshold	$Q_{g(th)}$	-	4.1	-	nC	V_{DD}=12 V, I_D=30 A, V_{GS}=0 to 4.5 V
Gate to drain charge[2)]	Q_{gd}	-	4.3	6.5	nC	V_{DD}=12 V, I_D=30 A, V_{GS}=0 to 4.5 V
Switching charge	Q_{sw}	-	6.6	-	nC	V_{DD}=12 V, I_D=30 A, V_{GS}=0 to 4.5 V
Gate charge total[2)]	Q_g	-	17	23	nC	V_{DD}=12 V, I_D=30 A, V_{GS}=0 to 4.5 V
Gate plateau voltage	$V_{plateau}$	-	2.5	-	V	V_{DD}=12 V, I_D=30 A, V_{GS}=0 to 4.5 V
Gate charge total[2)]	Q_g	-	36	48	nC	V_{DD}=12 V, I_D=30 A, V_{GS}=0 to 10 V
Gate charge total, sync. FET	$Q_{g(sync)}$	-	15	-	nC	V_{DS}=0.1 V, V_{GS}=0 to 4.5 V
Output charge[2)]	Q_{oss}	-	23	31	nC	V_{DD}=12 V, V_{GS}=0 V

Table 7 Reverse diode

Parameter	Symbol	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
Diode continuous forward current	I_S	-	-	69	A	T_C=25 °C
Diode pulse current	$I_{S,pulse}$	-	-	612	A	T_C=25 °C
Diode forward voltage	V_{SD}	-	0.55	0.7	V	V_{GS}=0 V, I_F=7 A, T_j=25 °C
Reverse recovery charge	Q_{rr}	-	5	-	nC	V_R=15 V, I_F=7 A, di_F/dt=400 A/µs

[1)] See ″Gate charge waveforms″ for parameter definition
[2)] Defined by design. Not subject to production test

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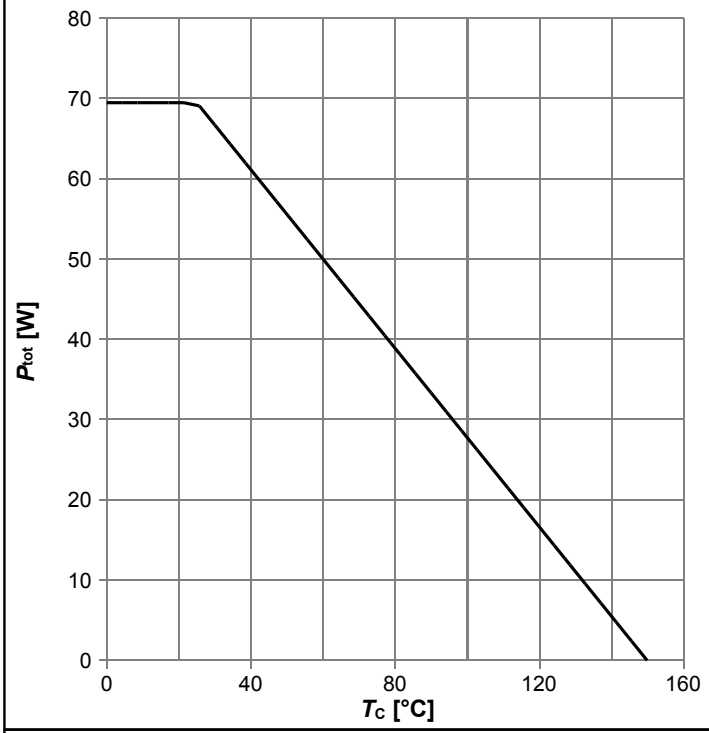
BSZ018NE2LSI

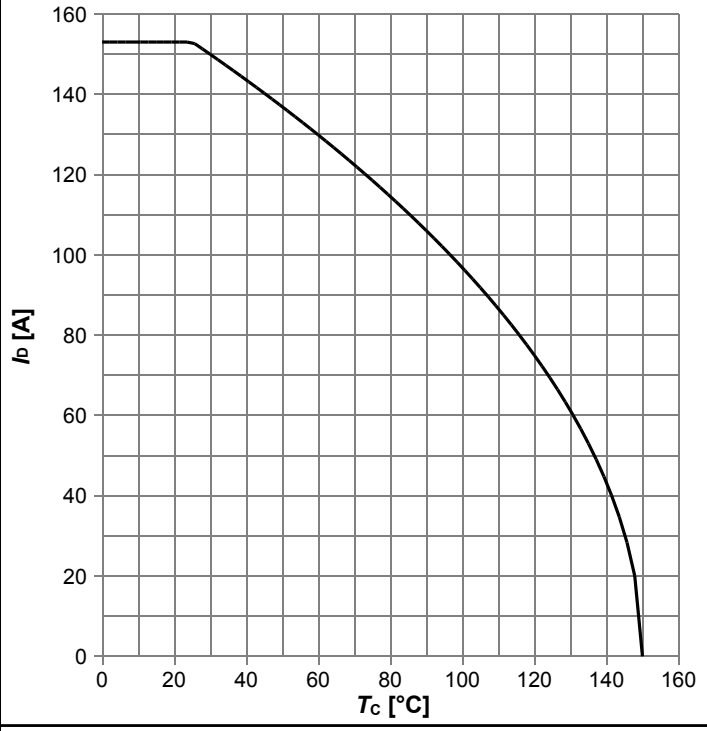
4 Electrical characteristics diagrams

Diagram 1: Power dissipation



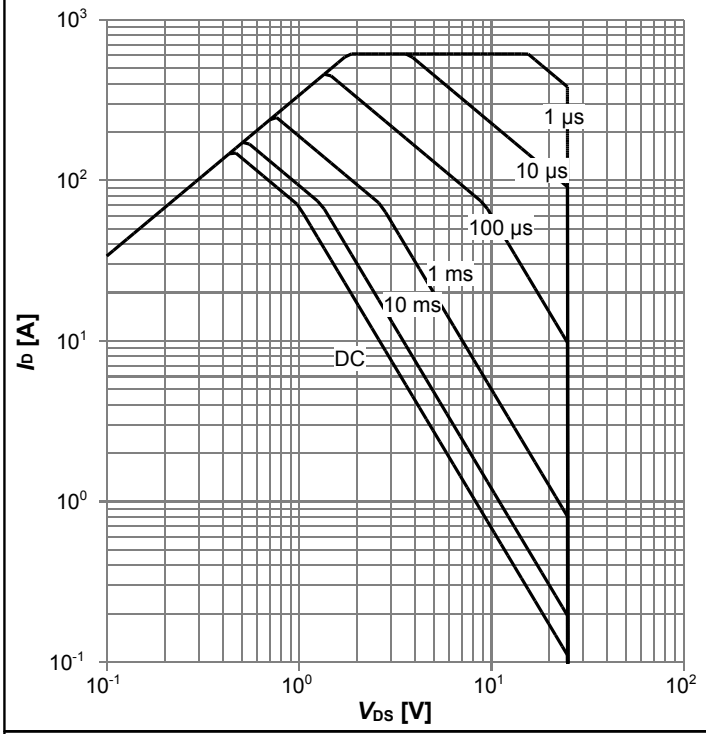
$P_{tot}=f(T_C)$

Diagram 2: Drain current



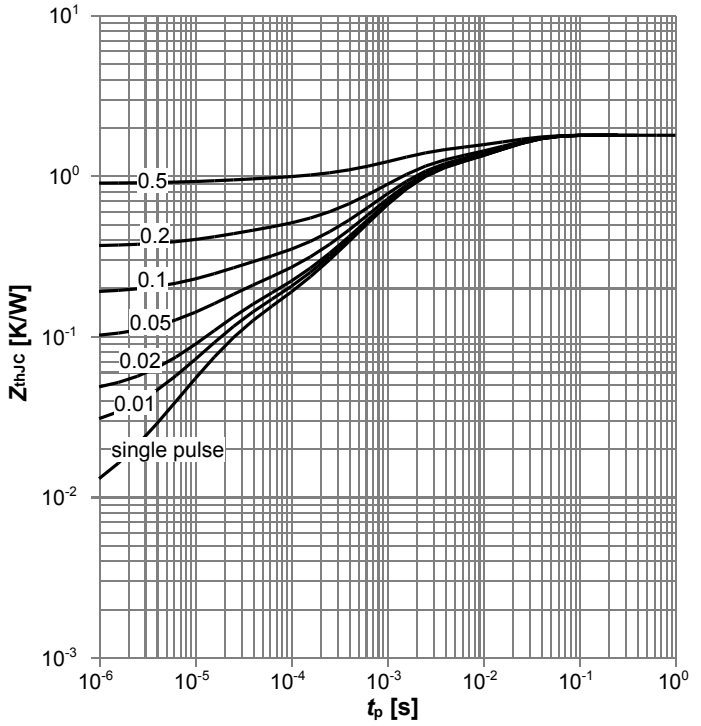
$I_D=f(T_C)$; $V_{GS}\geq 10$ V

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: $D=t_p/T$

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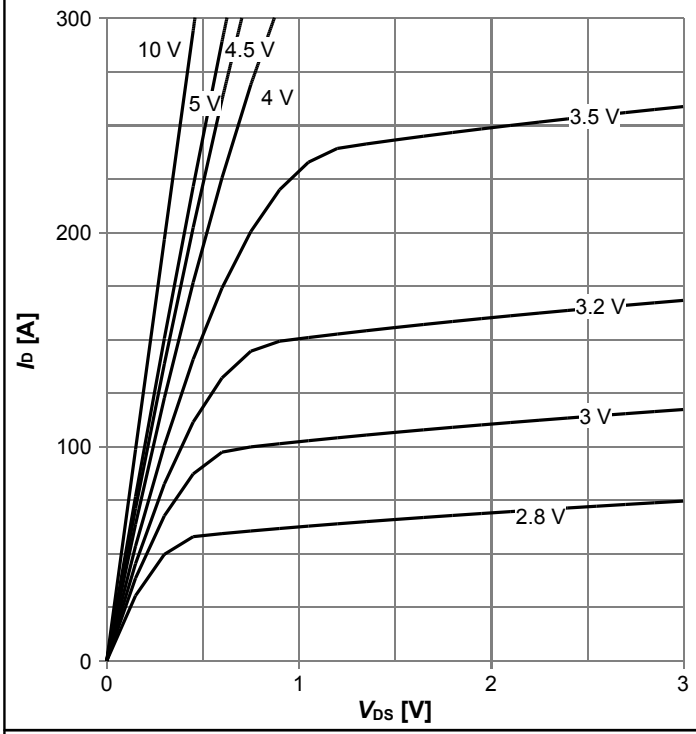
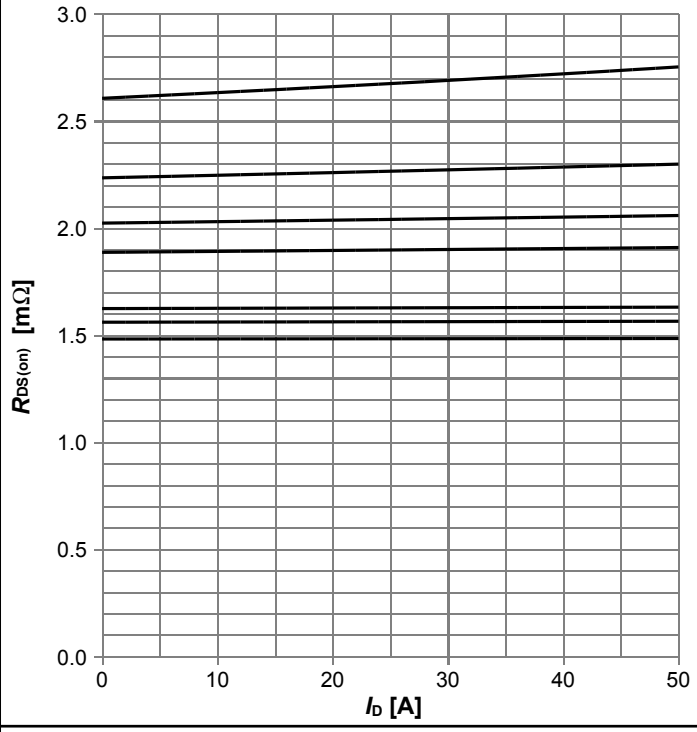
BSZ018NE2LSI

Diagram 5: Typ. output characteristics



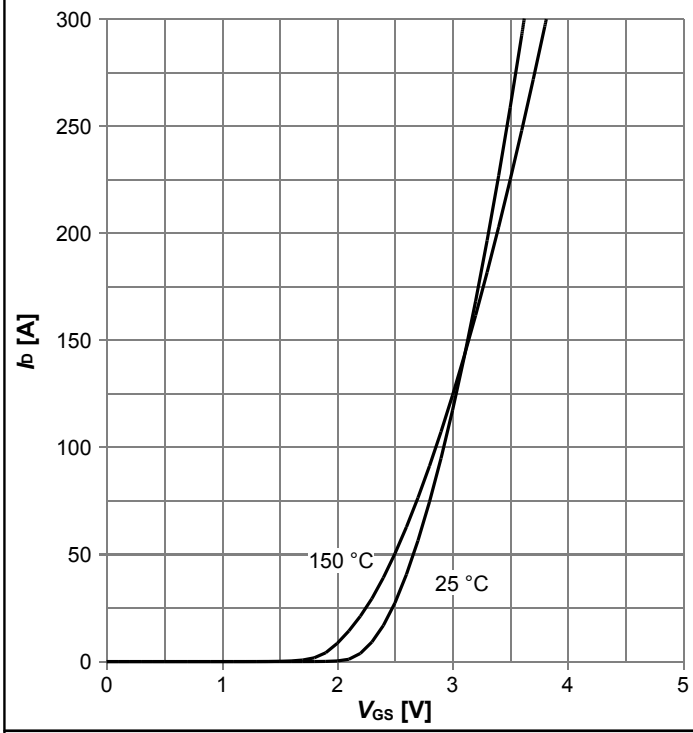
$I_D=f(V_{DS})$; $T_j=25$ °C; parameter: V_{GS}

Diagram 6: Typ. drain-source on resistance



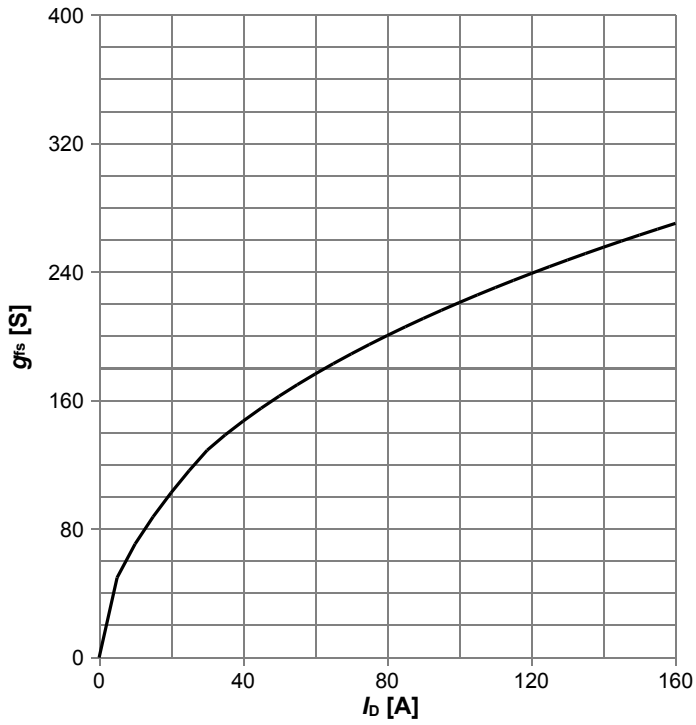
$R_{DS(on)}=f(I_D)$; $T_j=25$ °C; parameter: V_{GS}

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. forward transconductance



$g_{fs}=f(I_D)$; $T_j=25$ °C

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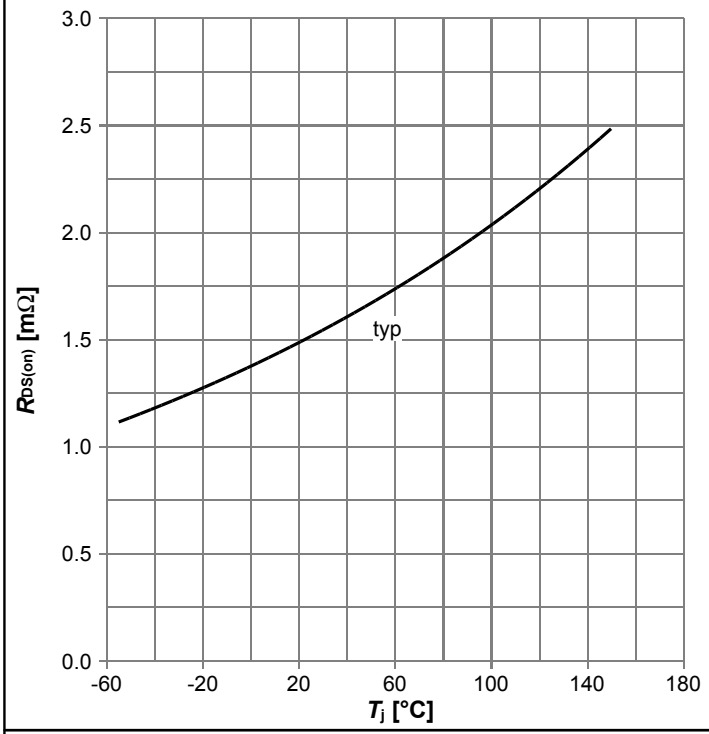
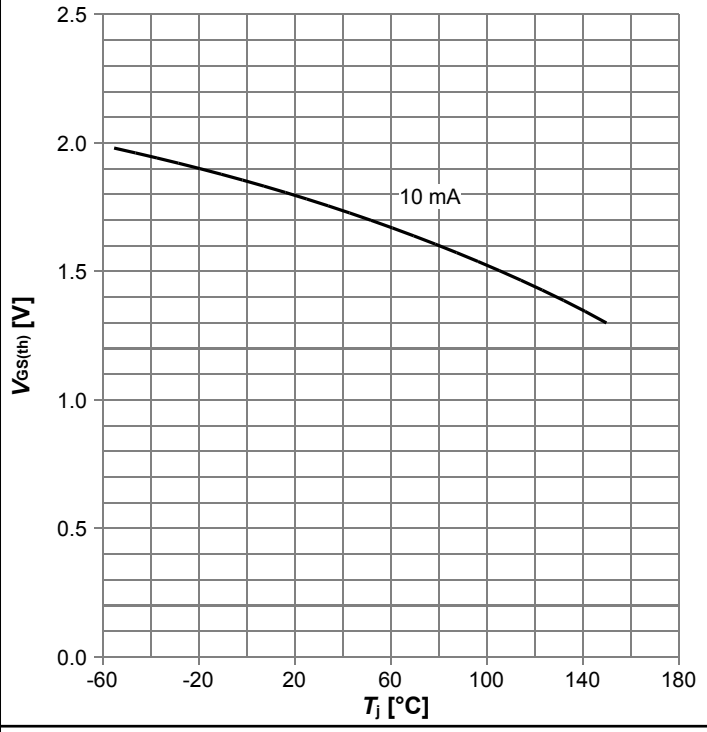
Diagram 9: Drain-source on-state resistance



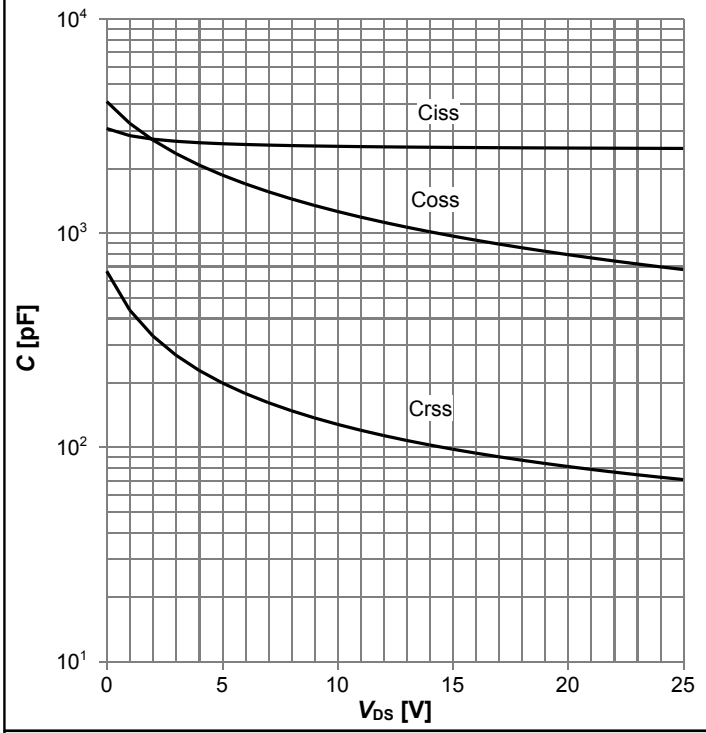
$R_{DS(on)}$=f(T_j); I_D=20 A; V_{GS}=10 V

Diagram 10: Typ. gate threshold voltage



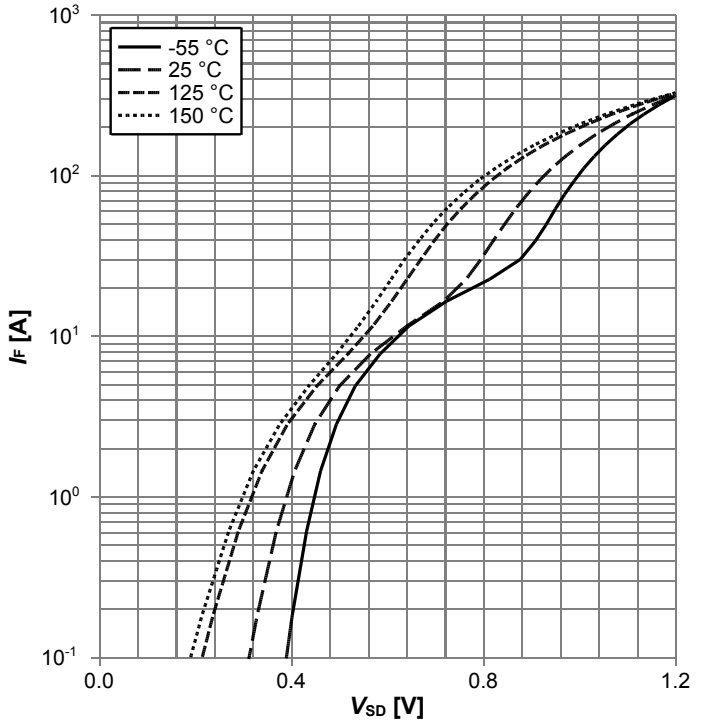
$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}; I_D=10 mA

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

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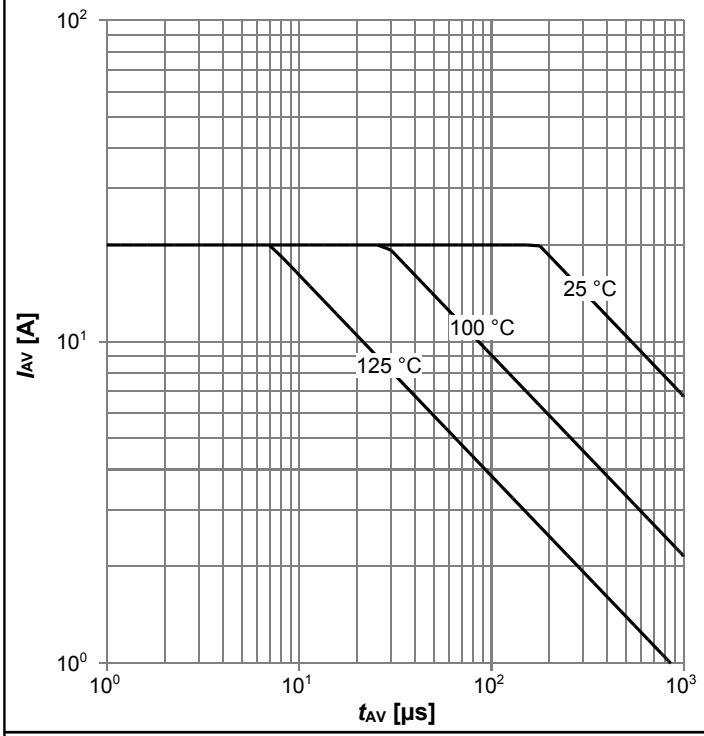
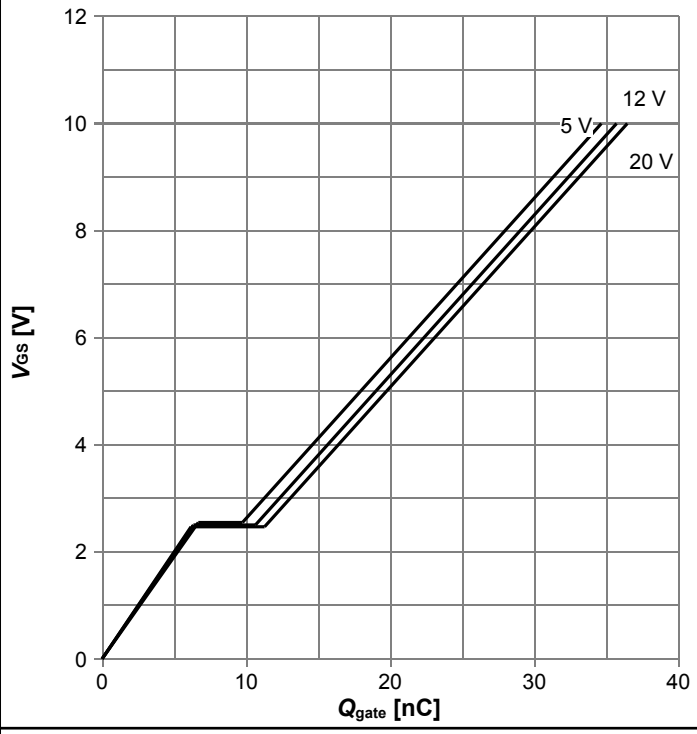
BSZ018NE2LSI

Diagram 13: Avalanche characteristics



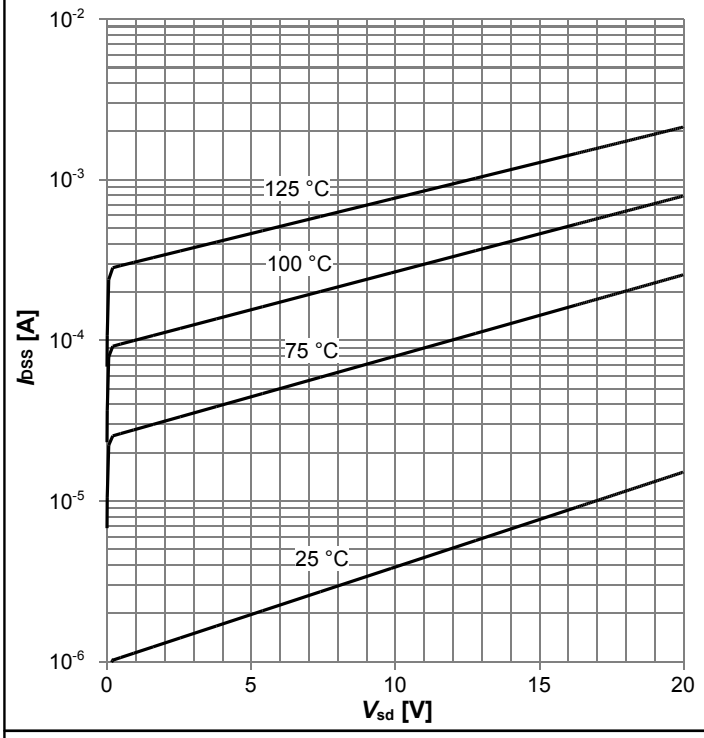
I_{AS}=f(t_{AV}); R_{GS}=25 Ω; parameter: $T_{j(start)}$

Diagram 14: Typ. gate charge



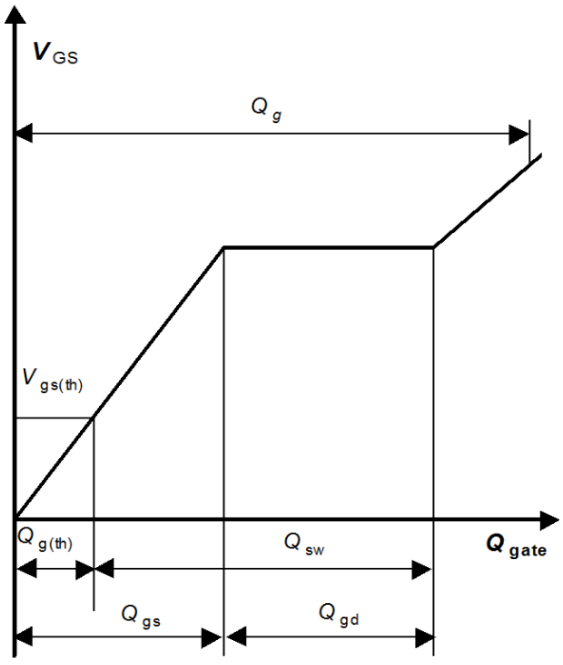
V_{GS}=f(Q_{gate}); I_D=30 A pulsed; parameter: V_{DD}

Diagram 15: Typ. drain-source leakage current

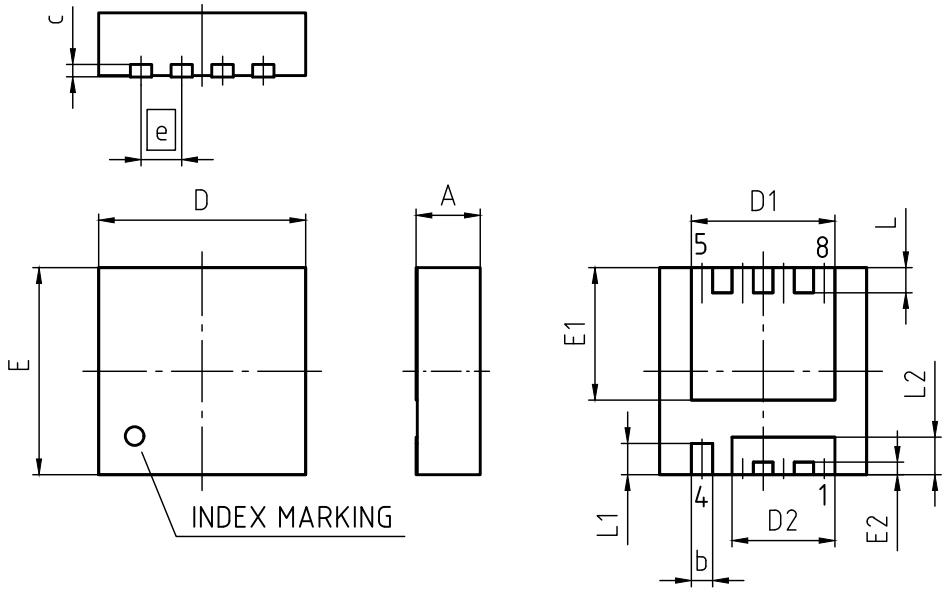


I_{DSS}=f(V_{DS}); V_{GS}=0 V; parameter: T_j

Diagram Gate charge waveforms



5 Package Outlines



PACKAGE - GROUP NUMBER:	PG-TSDSON-8-U03	
REVISION: 03	DATE: 20.10.2020	
DIMENSIONS	**MILLIMETERS**	
	MIN.	MAX.
A	0.90	1.10
b	0.24	0.44
c	(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
e	0.65	
L	0.30	0.50
L1	0.40	0.60
L2	0.50	0.70
aaa	0.06	

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

OptiMOS™ Power-MOSFET, 25 V
BSZ018NE2LSI

Revision History

BSZ018NE2LSI

Revision: 2020-12-21, Rev. 2.3

Previous Revision		
Revision	Date	Subjects (major changes since last revision)
2.2	2020-08-11	Update current rating and footnotes
2.3	2020-12-21	Update package drawing

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