

BSC024N025S G Datasheet



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DiGi Electronics Part Number	BSC024N025S G-DG
Manufacturer	Infineon Technologies
Manufacturer Product Number	BSC024N025S G
Description	MOSFET N-CH 25V 27A/100A TDSON
Detailed Description	N-Channel 25 V 27A (Ta), 100A (Tc) 2.8W (Ta), 89W (Tc) Surface Mount PG-TDSON-8-1



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Purchase and inquiry

Manufacturer Product Number:

BSC024N025S G

Series:

OptiMOS™

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

25 V

Drive Voltage (Max Rds On, Min Rds On):

4.5V, 10V

Vgs(th) (Max) @ Id:

2V @ 90µA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 150°C (Tj)

Supplier Device Package:

PG-TDSON-8-1

Manufacturer:

Infineon Technologies

Product Status:

Obsolete

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

27A (Ta), 100A (Tc)

Rds On (Max) @ Id, Vgs:

2.4mOhm @ 50A, 10V

Gate Charge (Qg) (Max) @ Vgs:

52 nC @ 5 V

Input Capacitance (Ciss) (Max) @ Vds:

6530 pF @ 15 V

Power Dissipation (Max):

2.8W (Ta), 89W (Tc)

Mounting Type:

Surface Mount

Package / Case:

8-PowerTDFN

Environmental & Export classification

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095



BSC024N025S G

OptiMOS[®] 2 Power-Transistor

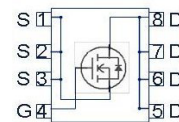
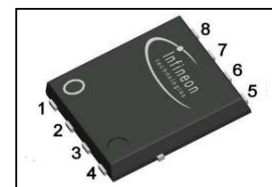
Features

- Fast switching MOSFET for SMPS
- Optimized technology for notebook DC/DC converters
- Qualified according to JEDEC¹ for target applications
- Logic level / N-channel
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Very low on-resistance $R_{DS(on)}$
- Superior thermal resistance
- Avalanche rated
- dv/dt rated
- Pb-free lead plating; RoHS compliant

Product Summary

V_{DS}	25	V
$R_{DS(on),max}$	2.4	m Ω
I_D	100	A

PG-TDSO8



Type	Package	Marking
BSC024N025S G	PG-TDSO8	24N025S

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_C=25\text{ }^\circ\text{C}$	100	A
		$T_C=100\text{ }^\circ\text{C}$	95	
		$T_A=25\text{ }^\circ\text{C}$, $R_{thJA}=45\text{ K/W}^2$	27	
Pulsed drain current	$I_{D,pulse}$	$T_C=25\text{ }^\circ\text{C}^{(3)}$	200	
Avalanche energy, single pulse	E_{AS}	$I_D=50\text{ A}$, $R_{GS}=25\text{ }\Omega$	800	mJ
Reverse diode dv/dt	dv/dt	$I_D=50\text{ A}$, $V_{DS}=24\text{ V}$, $di/dt=200\text{ A}/\mu\text{s}$, $T_{j,max}=150\text{ }^\circ\text{C}$	6	kV/ μs
Gate source voltage	V_{GS}		± 20	V
Power dissipation	P_{tot}	$T_C=25\text{ }^\circ\text{C}$	89	W
		$T_A=25\text{ }^\circ\text{C}$, $R_{thJA}=45\text{ K/W}^2$	2.8	
Operating and storage temperature	T_j , T_{stg}		-55 ... 150	$^\circ\text{C}$
IEC climatic category; DIN IEC 68-1			55/150/56	



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Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Thermal characteristics

Thermal resistance, junction - case	R_{thJC}	bottom	-	-	1.4	K/W
		top			18	
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint	-	-	62	
		6 cm ² cooling area ²⁾	-	-	45	

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

Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=1\text{ mA}$	25	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=90\text{ }\mu\text{A}$	1.2	1.6	2	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=25\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ }^\circ\text{C}$	-	0.1	1	μA
		$V_{DS}=25\text{ V}, V_{GS}=0\text{ V}, T_j=125\text{ }^\circ\text{C}$	-	10	100	
Gate-source leakage current	I_{GSS}	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$	-	10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=4.5\text{ V}, I_D=50\text{ A}$	-	3.0	3.7	m Ω
		$V_{GS}=10\text{ V}, I_D=50\text{ A}$	-	2.0	2.4	
Gate resistance	R_G		-	1.2	-	Ω
Transconductance	g_{fs}	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=50\text{ A}$	59	119	-	S

¹⁾J-STD20 and JESD22

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



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Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=15\text{ V},$ $f=1\text{ MHz}$	-	4910	6530	pF
Output capacitance	C_{oss}		-	1870	2490	
Reverse transfer capacitance	C_{rss}		-	220	330	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=15\text{ V}, V_{GS}=10\text{ V},$ $I_D=25\text{ A}, R_G=2.7\ \Omega$	-	8.9	13	ns
Rise time	t_r		-	9	13	
Turn-off delay time	$t_{d(off)}$		-	39	59	
Fall time	t_f		-	7	11	

Gate Charge Characteristics⁴⁾

Gate to source charge	Q_{gs}	$V_{DD}=15\text{ V}, I_D=25\text{ A},$ $V_{GS}=0\text{ to }5\text{ V}$	-	14	19	nC
Gate charge at threshold	$Q_{g(th)}$		-	8	10	
Gate to drain charge	Q_{gd}		-	10	15	
Switching charge	Q_{sw}		-	17	24	
Gate charge total	Q_g		-	39	52	
Gate plateau voltage	$V_{plateau}$		-	2.9	-	
Gate charge total, sync. FET	$Q_{g(sync)}$	$V_{DS}=0.1\text{ V},$ $V_{GS}=0\text{ to }5\text{ V}$	-	35	46	nC
Output charge	Q_{oss}	$V_{DD}=15\text{ V}, V_{GS}=0\text{ V}$	-	41	54	

Reverse Diode

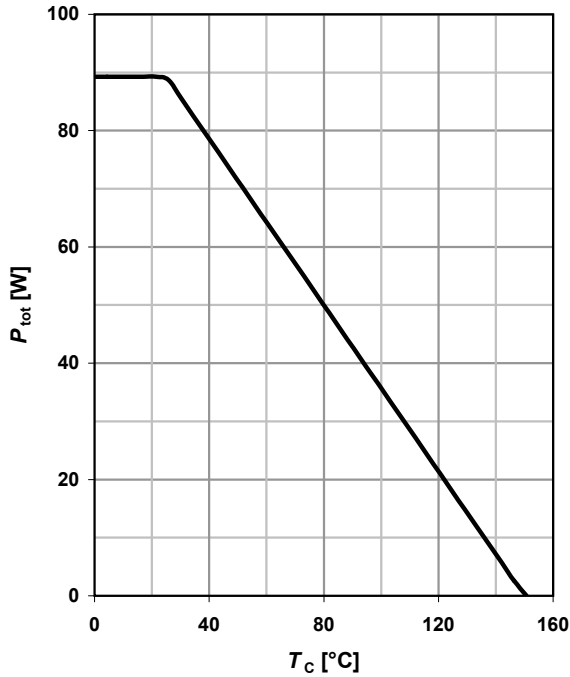
Diode continuous forward current	I_S	$T_C=25\text{ }^\circ\text{C}$	-	-	50	A
Diode pulse current	$I_{S,pulse}$		-	-	200	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=50\text{ A},$ $T_j=25\text{ }^\circ\text{C}$	-	0.83	1	V
Reverse recovery charge	Q_{rr}	$V_R=15\text{ V}, I_F=I_S,$ $di_F/dt=400\text{ A}/\mu\text{s}$	-	-	18	nC

⁴⁾ See figure 16 for gate charge parameter definition



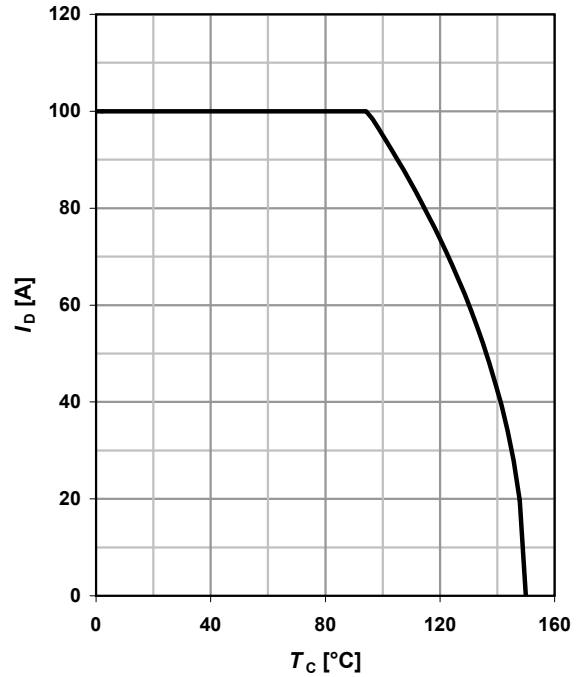
1 Power dissipation

$P_{tot}=f(T_C)$



2 Drain current

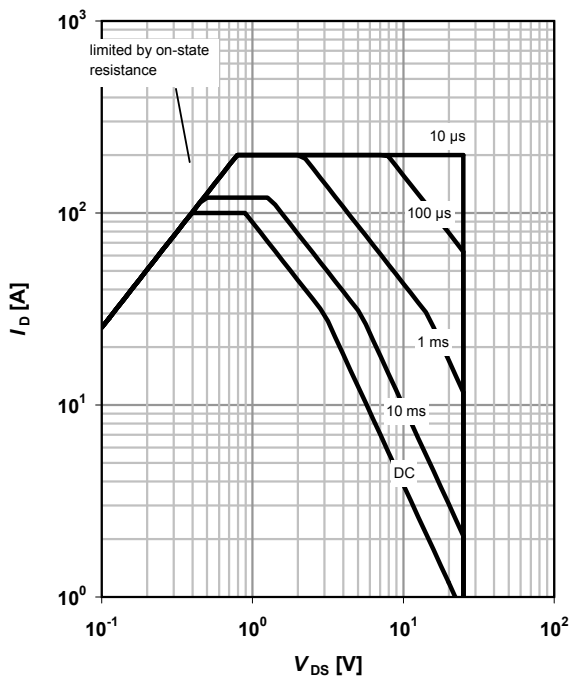
$I_D=f(T_C); V_{GS} \geq 10\text{ V}$



3 Safe operating area

$I_D=f(V_{DS}); T_C=25\text{ °C}; D=0$

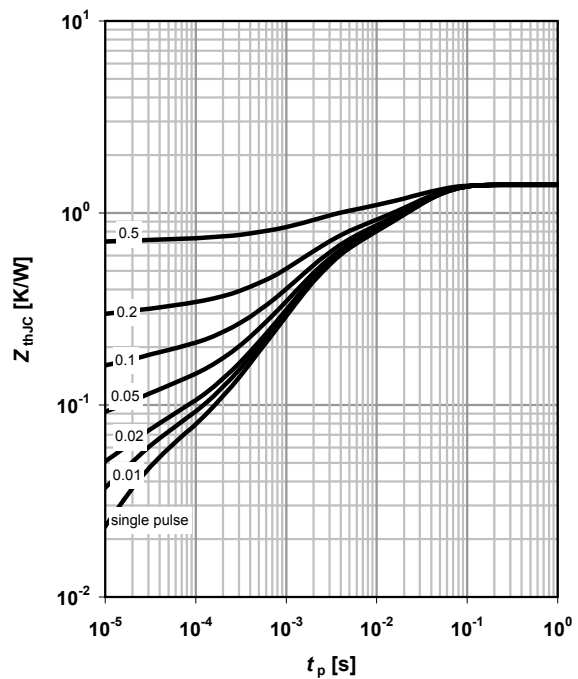
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJC}=f(t_p)$

parameter: $D=t_p/T$

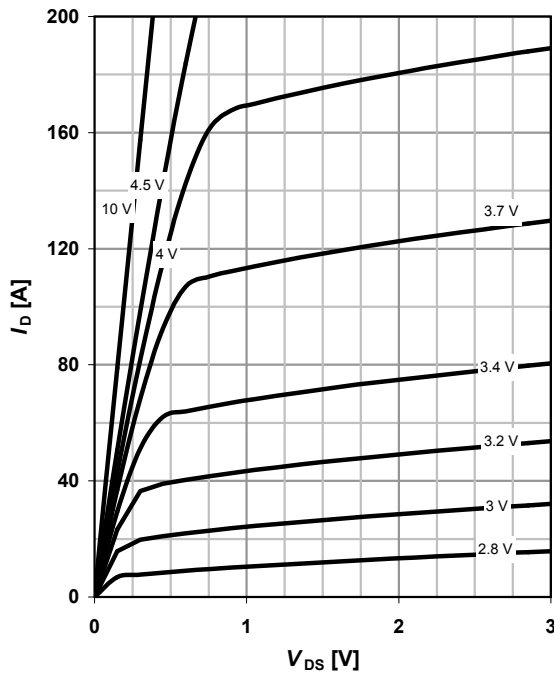




5 Typ. output characteristics

$I_D = f(V_{DS}); T_j = 25\text{ }^\circ\text{C}$

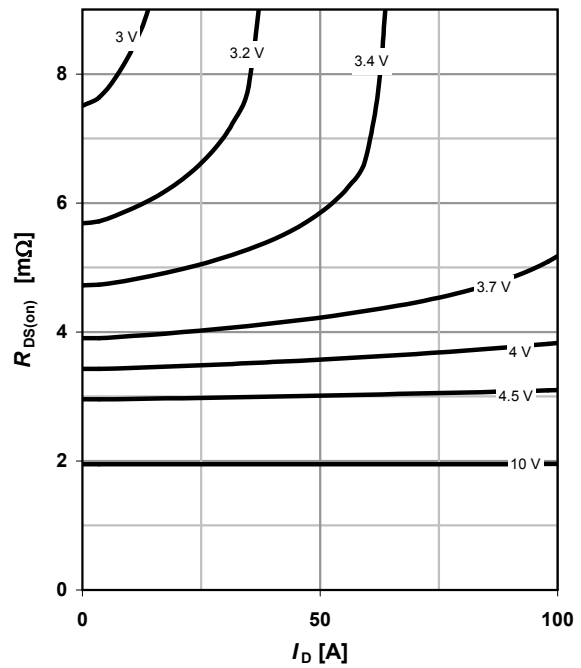
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)} = f(I_D); T_j = 25\text{ }^\circ\text{C}$

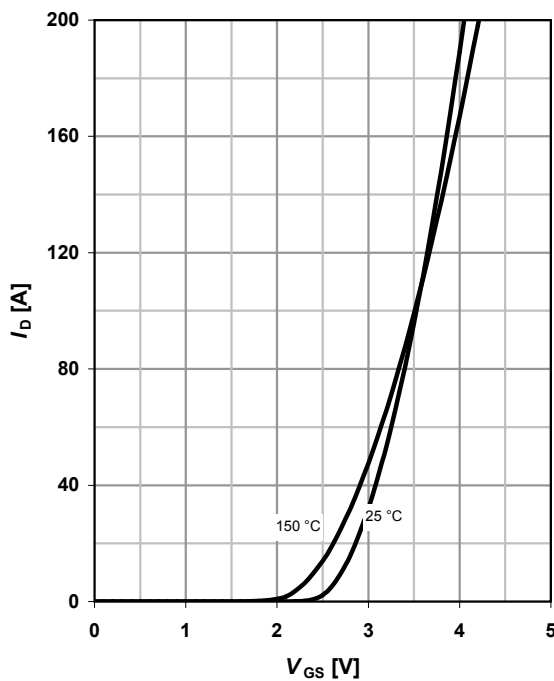
parameter: V_{GS}



7 Typ. transfer characteristics

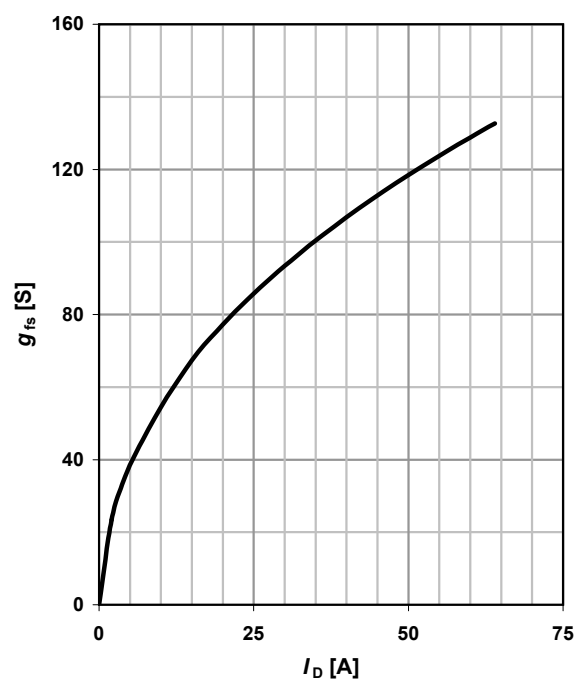
$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$

parameter: T_j



8 Typ. forward transconductance

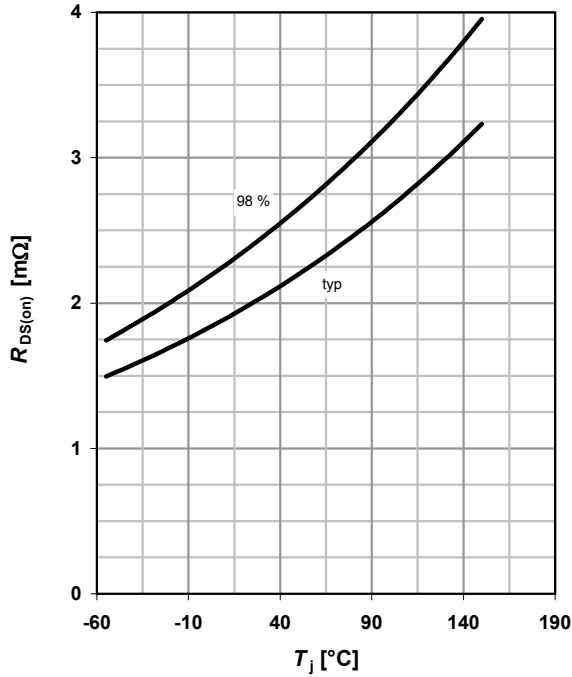
$g_{fs} = f(I_D); T_j = 25\text{ }^\circ\text{C}$





9 Drain-source on-state resistance

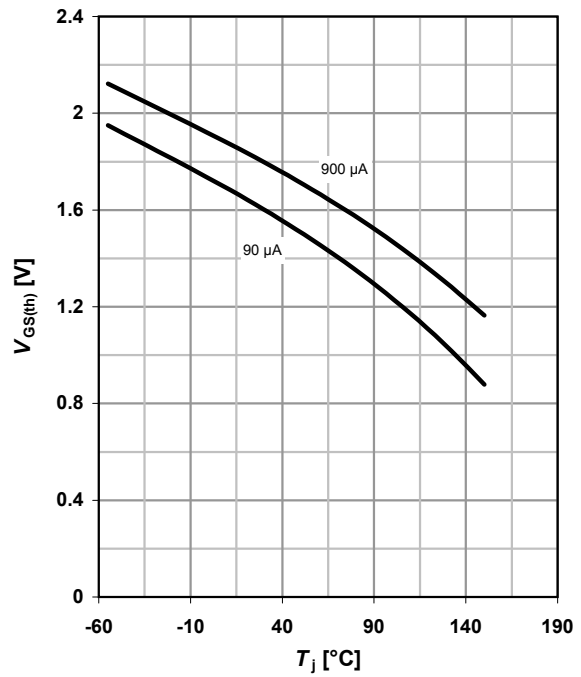
$R_{DS(on)} = f(T_j); I_D = 50 \text{ A}; V_{GS} = 10 \text{ V}$



10 Typ. gate threshold voltage

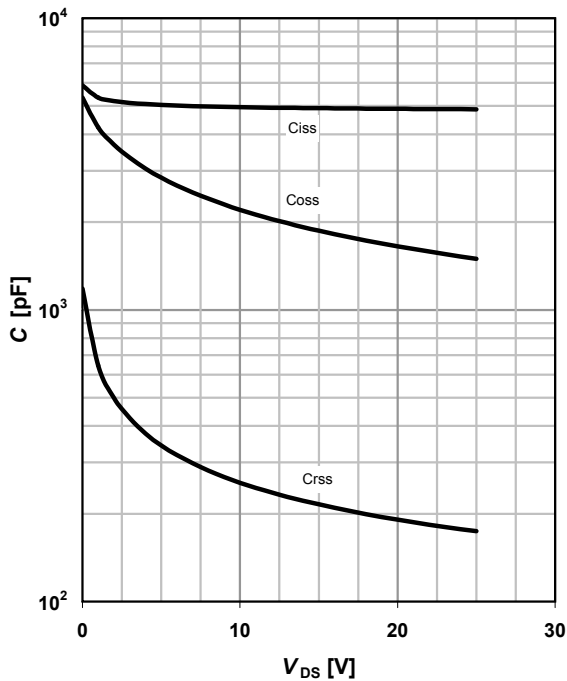
$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}$

parameter: I_D



11 Typ. capacitances

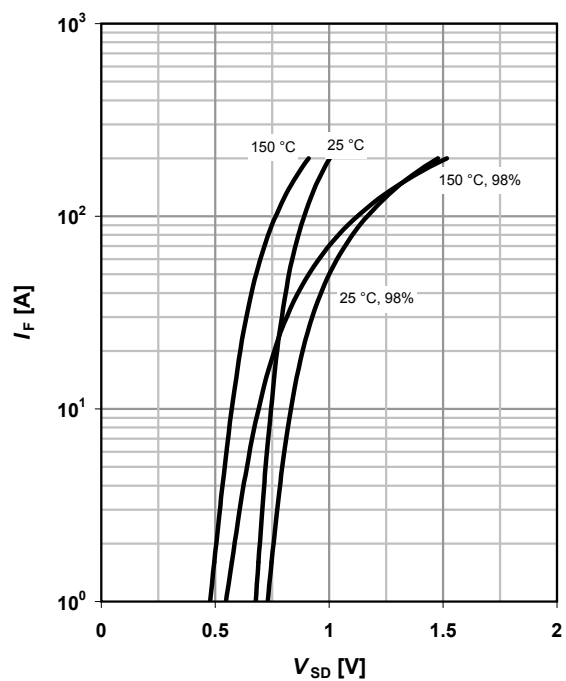
$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$



12 Forward characteristics of reverse diode

$I_F = f(V_{SD})$

parameter: T_j

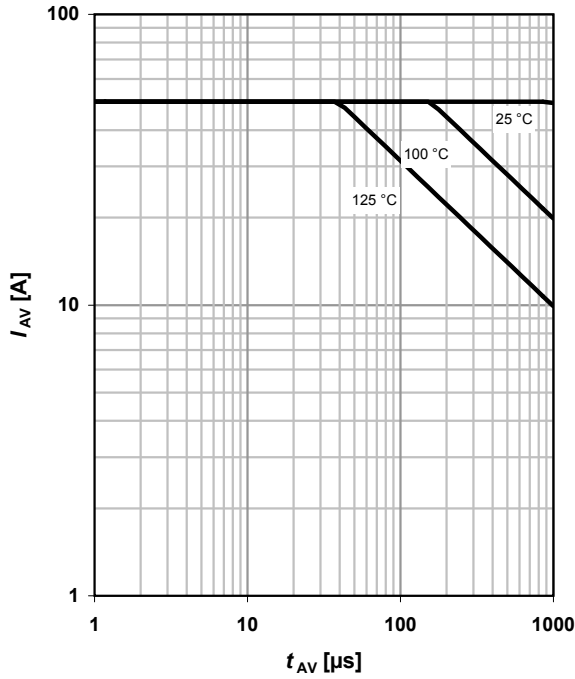




13 Avalanche characteristics

$I_{AS}=f(t_{AV}); R_{GS}=25 \Omega$

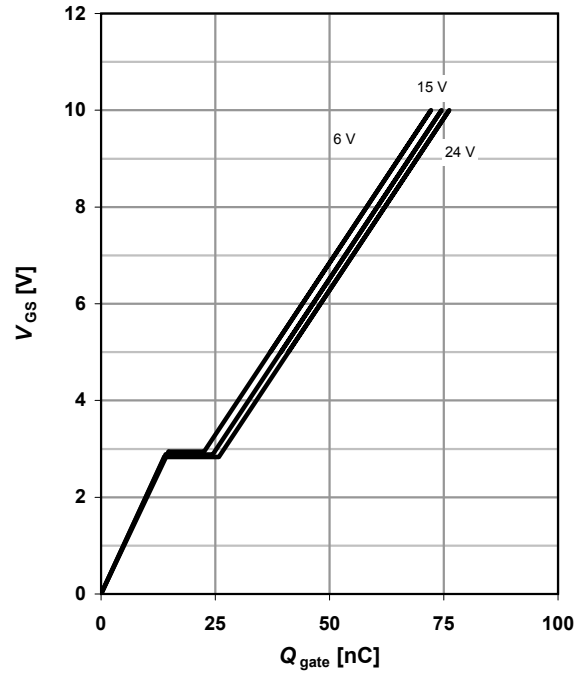
parameter: $T_{j(start)}$



14 Typ. gate charge

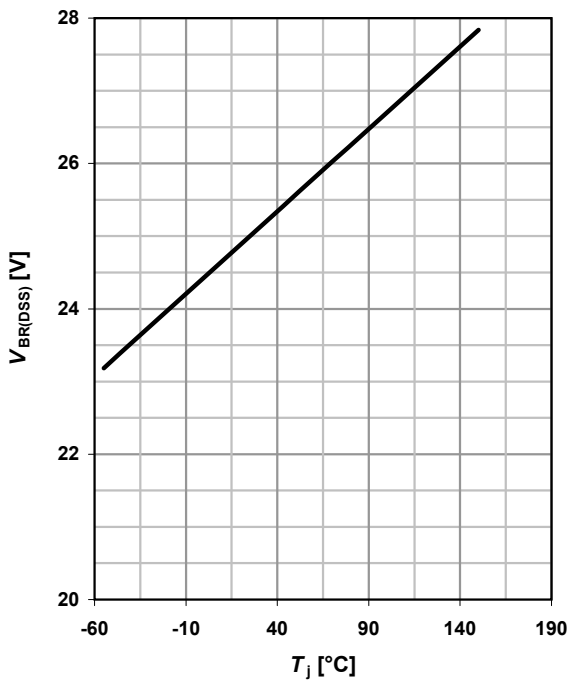
$V_{GS}=f(Q_{gate}); I_D=25 \text{ A pulsed}$

parameter: V_{DD}

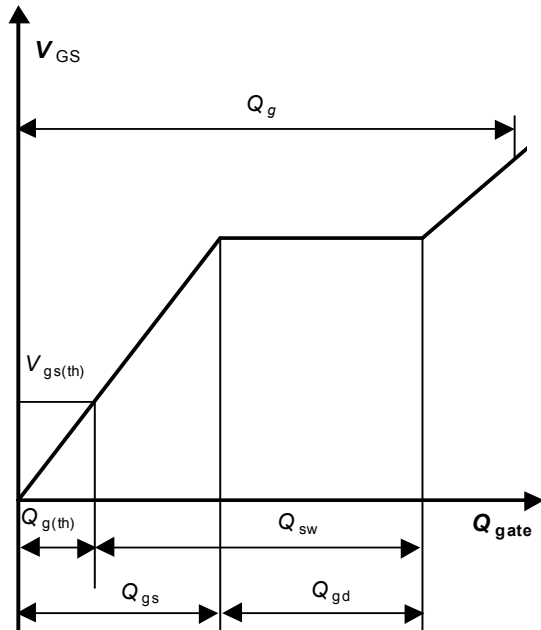


15 Drain-source breakdown voltage

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



16 Gate charge waveforms

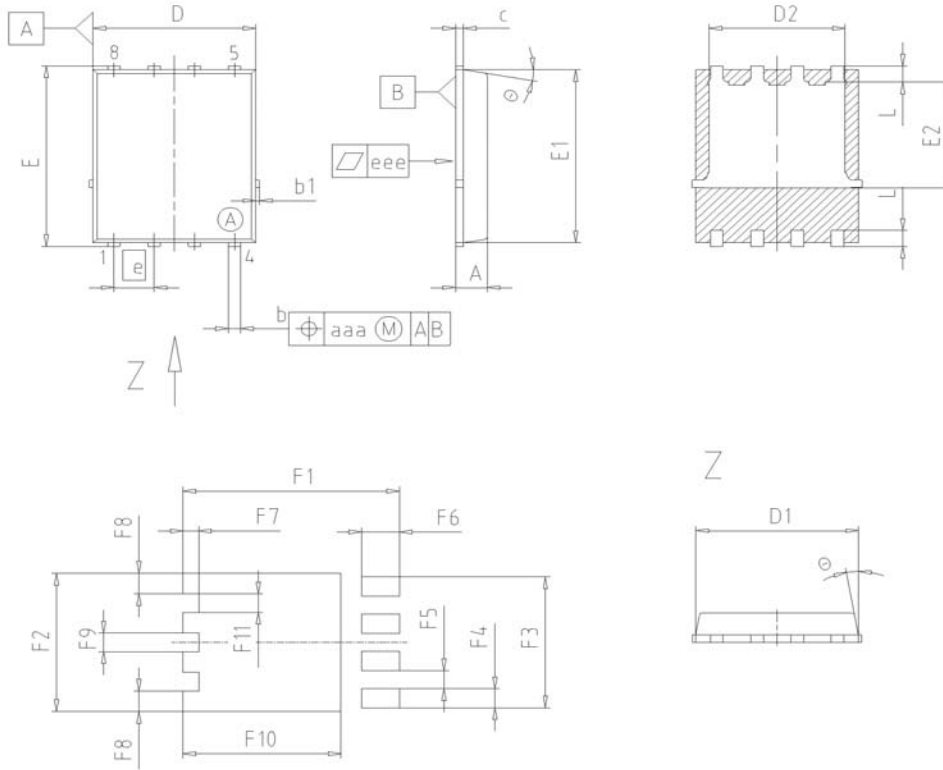




Package Outline

PG-TDSO8

P-TDSO8: Outline



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.10	0.035	0.043
b	0.34	0.54	0.013	0.021
b1	0.02	0.22	0.001	0.008
c	0.15	0.35	0.006	0.014
D=D1	4.95	5.35	0.195	0.211
D2	4.20	4.40	0.165	0.173
E	5.95	6.35	0.234	0.250
E1	5.70	6.10	0.224	0.240
E2	3.40	3.80	0.134	0.150
e	1.27		0.050	
N	8		8	
L	0.45	0.65	0.018	0.026
□	8.5°	11.5°	8.5°	11.5°
aaa	0.25		0.010	
eee	0.05		0.002	
F1	6.75	6.95	0.266	0.274
F2	4.60	4.80	0.181	0.189
F3	4.36	4.56	0.172	0.180
F4	0.55	0.75	0.022	0.030
F5	0.52	0.72	0.020	0.028
F6	1.10	1.30	0.043	0.051
F7	0.40	0.60	0.016	0.024
F8	0.60	0.80	0.024	0.031
F9	0.53	0.73	0.021	0.029
F10	4.90	5.10	0.193	0.201
F11	0.53	0.73	0.021	0.029

DOCUMENT NO.
Z8B00003332

SCALE 0 2.5 5mm

EUROPEAN PROJECTION

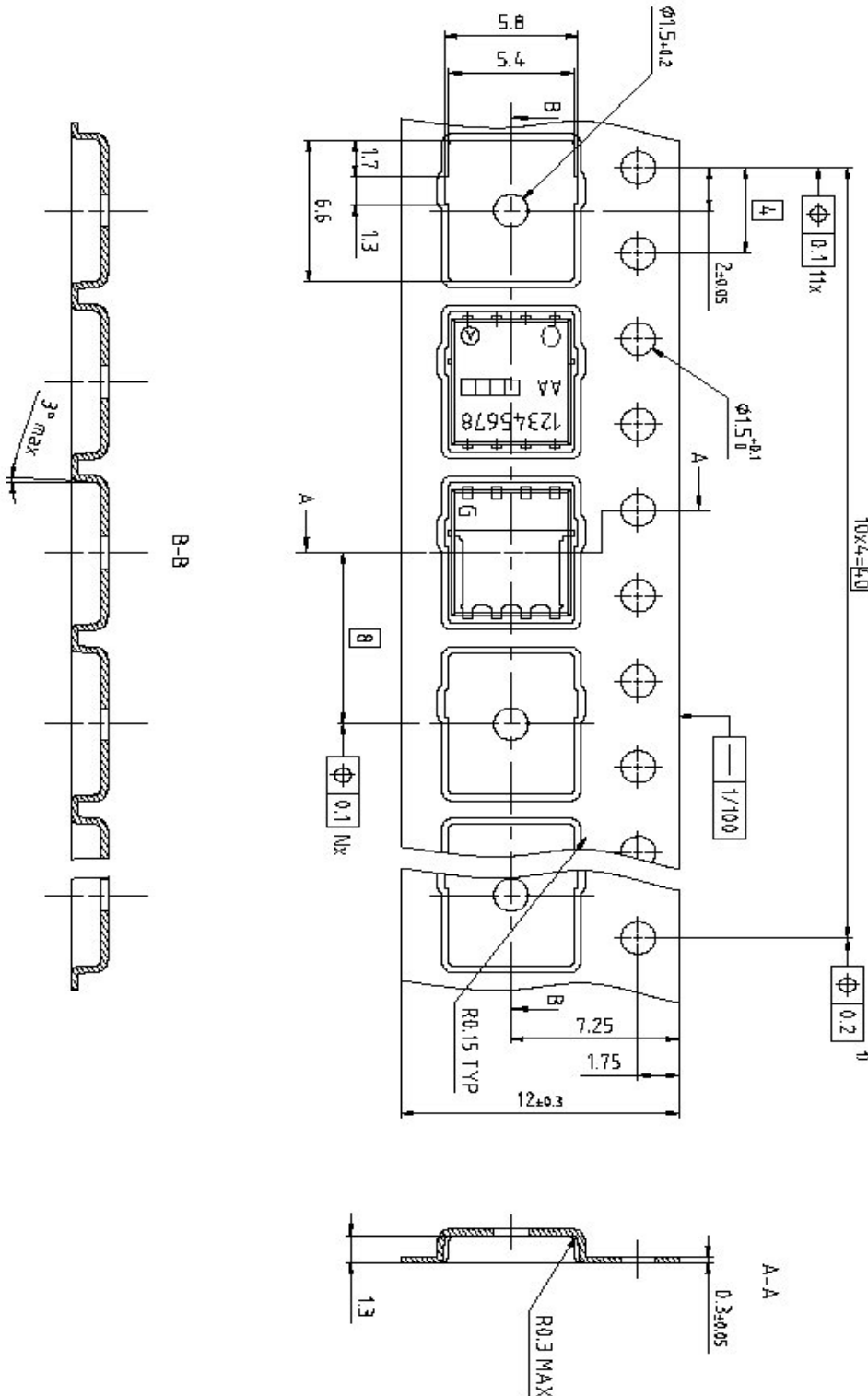
ISSUE DATE
08-03-2007

REVISION
03



Package Outline

P-TDSON-8: Tape



Dimensions in mm



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Infineon Technologies AG
81726 Munich, Germany
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