

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	BSC030N03LSG
▶ Overseas	Part Number	BSC030N03LSG
▶ Equivalent	Part Number	BSC030N03LSG

EV is the abbreviation of name EVVO

D N08D N

30V N-Channel Enhancement Mode MOSFET

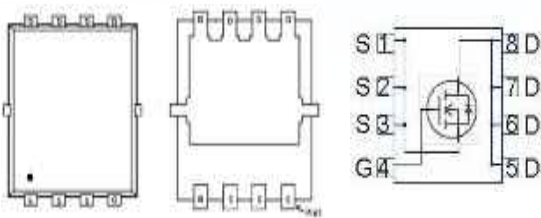
Features

- Fast switching MOSFET for SMPS
- Optimized technology for DC/DC converters
- Qualified according to JEDEC¹⁾ for target applications
- N-channel
- Logic level
- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Very low on-resistance $R_{DS(on)}$
- Superior thermal resistance
- 100% Avalanche tested
- Pb-free plating; RoHS compliant;
- Halogen-free according to IEC61249-2-21

Product Summary

$V_{DS} = 30V \quad I_D = 150 A$
 $R_{DS(on)} < 2.3 m\Omega @ V_{GS}=4.5 V$
 $R_{DS(on)} < 1.6 m\Omega @ V_{GS}=10 V$

PDFN5*6-8L Pin Configuration



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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$V_{GS}=10 V, T_C=25\text{ }^{\circ}\text{C}$	150	A
		$V_{GS}=10 V, T_C=100\text{ }^{\circ}\text{C}$	120	
Pulsed drain current ³⁾	$I_{D,pulse}$	$T_C=25\text{ }^{\circ}\text{C}$	400	
Avalanche current, single pulse ⁴⁾	I_{AS}	$T_C=25\text{ }^{\circ}\text{C}$	50	
Avalanche energy, single pulse	E_{AS}	$I_D=50 A, R_{GS}=25\text{ }\Omega$	295	mJ
Gate source voltage	V_{GS}		± 20	V

¹⁾ J-STD20 and JESD22

30V N-Channel Enhancement Mode MOSFET

Maximum ratings, at $T = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
Power dissipation	P_{tot}	$T_{\text{C}}=25\text{ }^{\circ}\text{C}$	139			W
		$T_{\text{A}}=25\text{ }^{\circ}\text{C}$, $R_{\text{thJA}}=50\text{ K/W}^2)$	2.5			
Operating and storage temperature	$T_{\text{j}}, T_{\text{stg}}$		-55 ... 150			$^{\circ}\text{C}$
IEC climatic category; DIN IEC 68-1			55/150/56			
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - case	R_{thJC}	bottom	-	-	0.9	K/W
		top			20	
Device on PCB	R_{thJA}	6 cm^2 cooling area ²⁾	-	-	50	
Electrical characteristics, at $T_{\text{j}}=25\text{ }^{\circ}\text{C}$, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}}=0\text{ V}$, $I_{\text{D}}=1\text{ mA}$	30	-	-	V
Gate threshold voltage	$V_{\text{GS(th)}}$	$V_{\text{DS}}=V_{\text{GS}}$, $I_{\text{D}}=85\text{ }\mu\text{A}$	1.2	-	2	
Zero gate voltage drain current	I_{DSS}	$V_{\text{DS}}=40\text{ V}$, $V_{\text{GS}}=0\text{ V}$, $T_{\text{j}}=25\text{ }^{\circ}\text{C}$	-	0.1	1	μA
		$V_{\text{DS}}=40\text{ V}$, $V_{\text{GS}}=0\text{ V}$, $T_{\text{j}}=125\text{ }^{\circ}\text{C}$	-	10	100	
Gate-source leakage current	I_{GSS}	$V_{\text{GS}}=20\text{ V}$, $V_{\text{DS}}=0\text{ V}$	-	10	100	nA
Drain-source on-state resistance	$R_{\text{DS(on)}}$	$V_{\text{GS}}=4.5\text{ V}$, $I_{\text{D}}=50\text{ A}$	-	1.8	2.3	m Ω
		$V_{\text{GS}}=10\text{ V}$, $I_{\text{D}}=50\text{ A}$	-	1.3	1.6	
Gate resistance	R_{G}		-	1.5	-	Ω
Transconductance	g_{fs}	$ V_{\text{DS}} >2 I_{\text{D}} R_{\text{DS(on)max}}$, $I_{\text{D}}=50\text{ A}$	95	190	-	S

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

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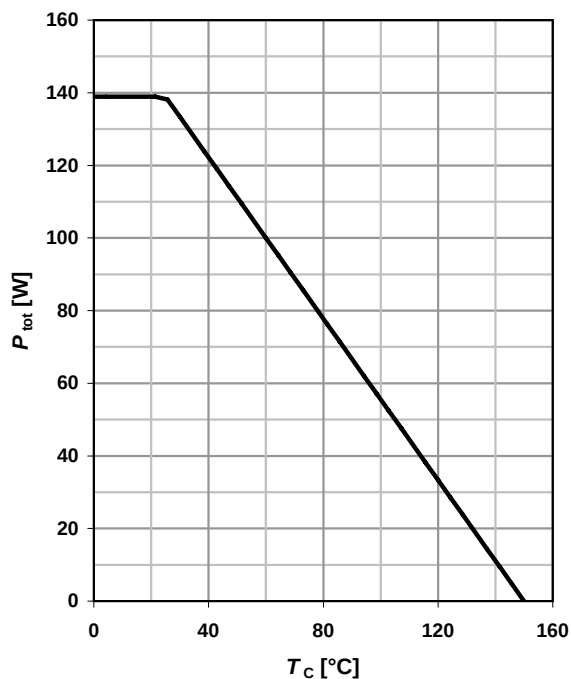
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=20\text{ V},$ $f=1\text{ MHz}$	-	8900	12000	pF
Output capacitance	C_{oss}		-	1800	2400	
Reverse transfer capacitance	C_{rss}		-	100	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=20\text{ V}, V_{GS}=10\text{ V},$ $I_D=30\text{ A}, R_G=1.6\text{ }\Omega$	-	14	-	ns
Rise time	t_r		-	7.6	-	
Turn-off delay time	$t_{d(off)}$		-	56	-	
Fall time	t_f		-	9.4	-	
Gate Charge Characteristics ⁵⁾						
Gate to source charge	Q_{gs}	$V_{DD}=20\text{ V}, I_D=30\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	25	-	nC
Gate charge at threshold	$Q_{g(th)}$		-	14	-	
Gate to drain charge	Q_{gd}		-	11	-	
Switching charge	Q_{sw}		-	23	-	
Gate charge total	Q_g		-	113	150	
Gate plateau voltage	$V_{plateau}$		-	2.9	-	V
Gate charge total	Q_g	$V_{DD}=20\text{ V}, I_D=30\text{ A},$ $V_{GS}=0\text{ to }4.5\text{ V}$	-	54	-	nC
Gate charge total, sync. FET	$Q_{g(sync)}$	$V_{DS}=0.1\text{ V},$ $V_{GS}=0\text{ to }10\text{ V}$	-	106	-	
Output charge	Q_{oss}	$V_{DD}=20\text{ V}, V_{GS}=0\text{ V}$	-	69	-	
Reverse Diode						
Diode continuous forward current	I_S	$T_C=25\text{ }^{\circ}\text{C}$	-	-	100	A
Diode pulse current	$I_{S,pulse}$		-	-	400	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=50\text{ A},$ $T_J=25\text{ }^{\circ}\text{C}$	-	0.8	1.2	V
Reverse recovery charge	Q_{rr}	$V_R=20\text{ V}, I_F=I_S,$ $di_F/dt=400\text{ A}/\mu\text{s}$	-	125	-	nC

⁵⁾ See figure 16 for gate charge parameter definition

30V N-Channel Enhancement Mode MOSFET

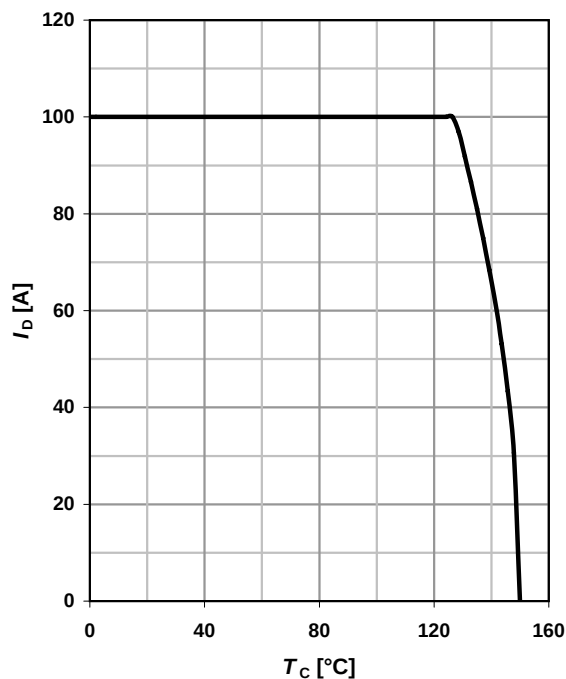
1 Power dissipation

$$P_{\text{tot}} = f(T_c)$$



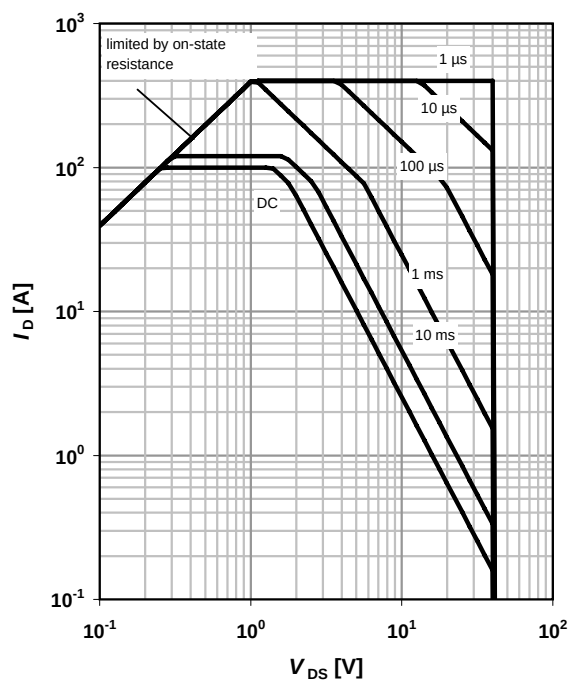
2 Drain current

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



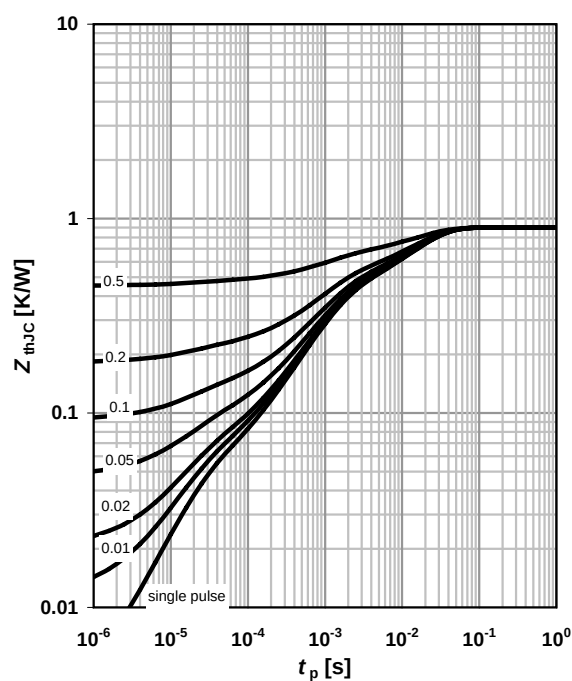
3 Safe operating area

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

parameter: t_p 

4 Max. transient thermal impedance

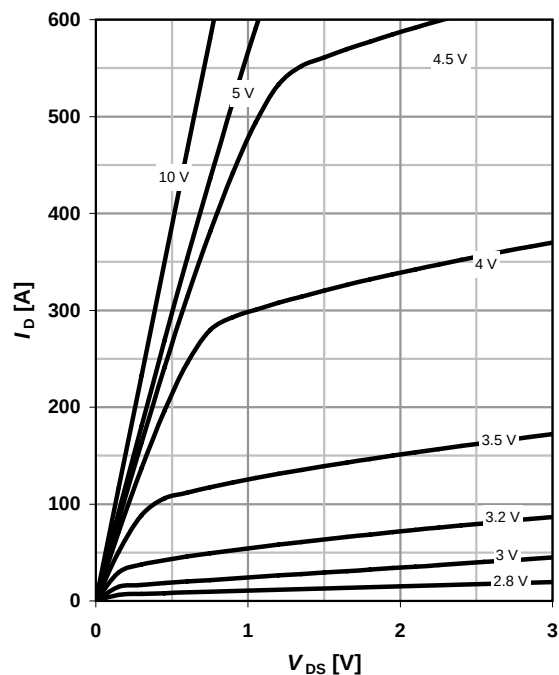
$$Z_{\text{thJC}} = f(t_p)$$

parameter: $D = t_p/T$ 

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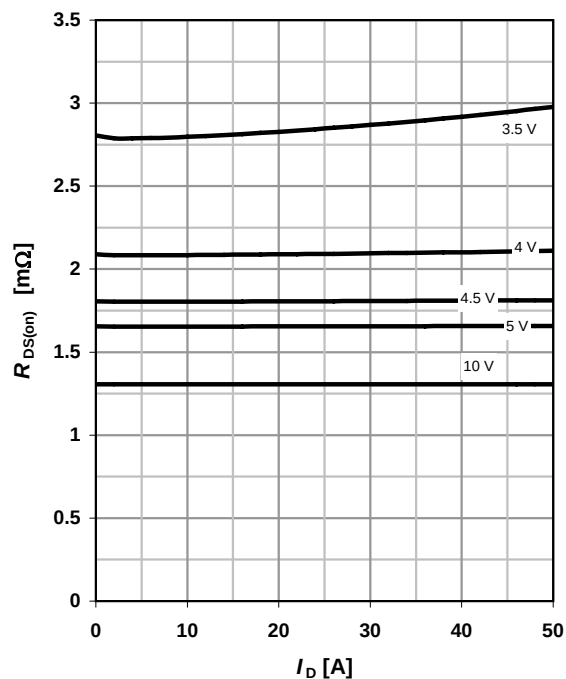
5 Typ. output characteristics

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

parameter: V_{GS} 

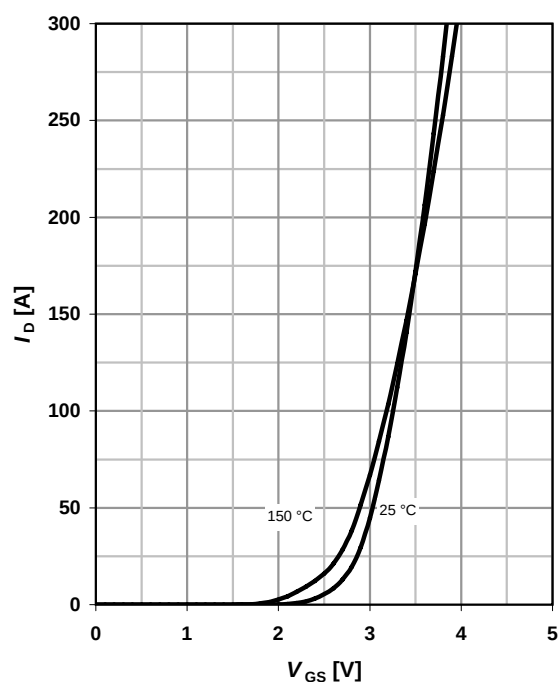
6 Typ. drain-source on resistance

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

parameter: V_{GS} 

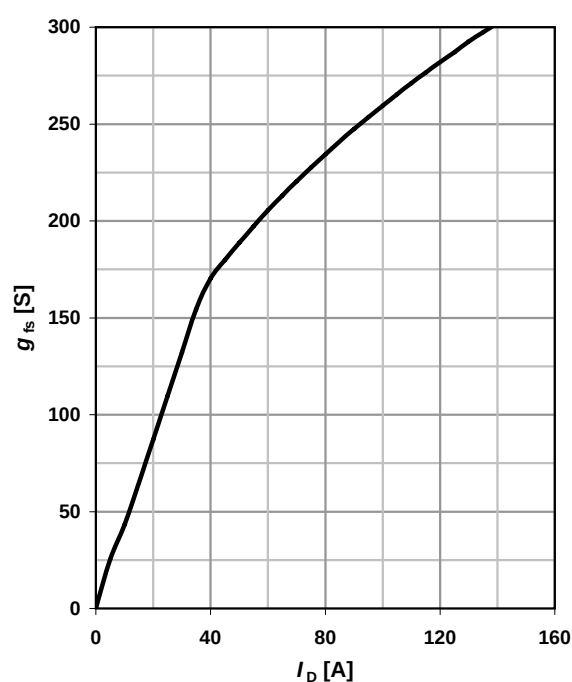
7 Typ. transfer characteristics

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

parameter: T_j 

8 Typ. forward transconductance

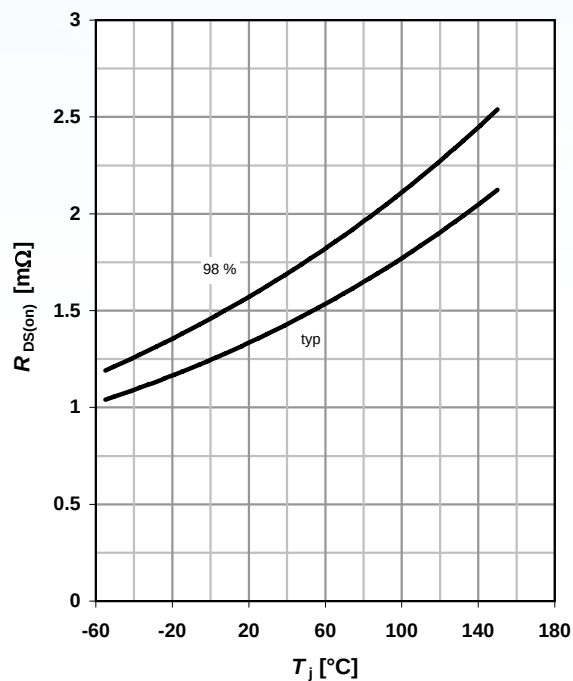
$$g_{fs} = f(I_D); T_j = 25^\circ\text{C}$$



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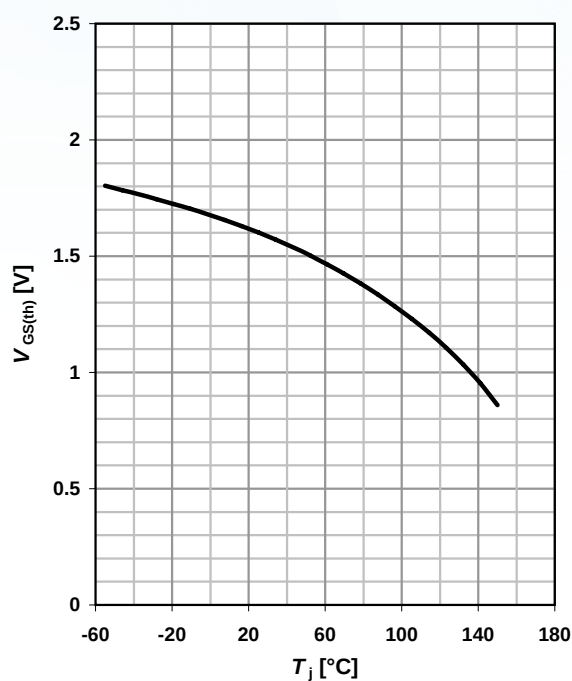
9 Drain-source on-state resistance

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



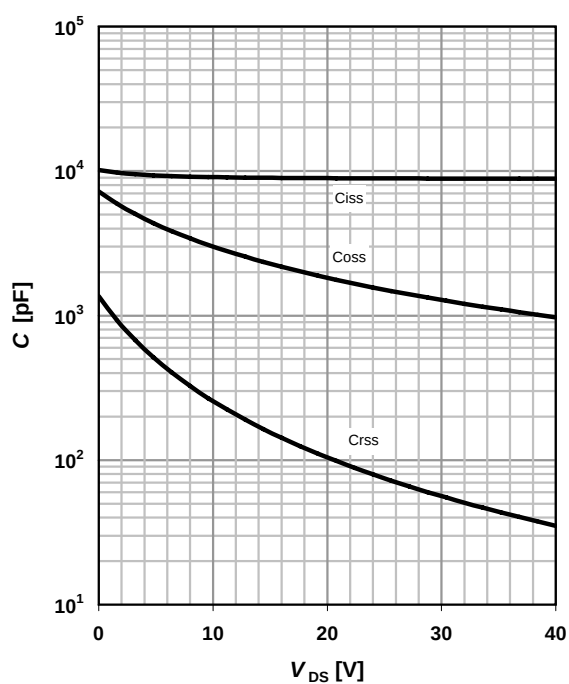
10 Typ. gate threshold voltage

$$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; I_D = 85 \mu\text{A}$$



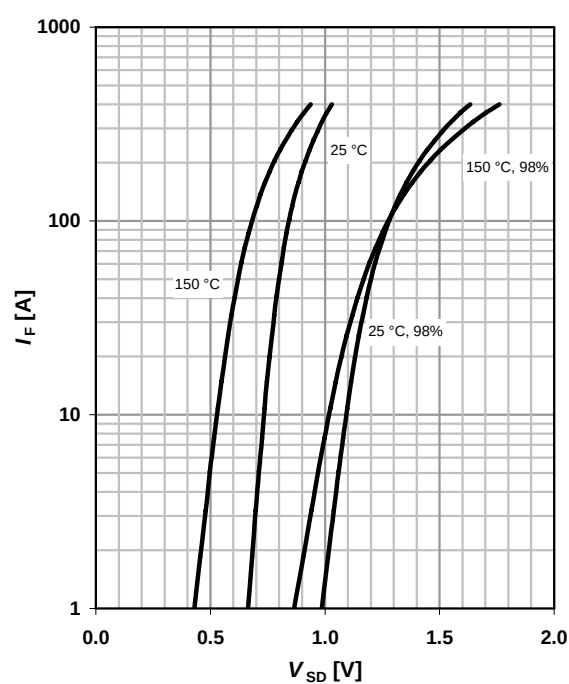
11 Typ. capacitances

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



12 Forward characteristics of reverse diode

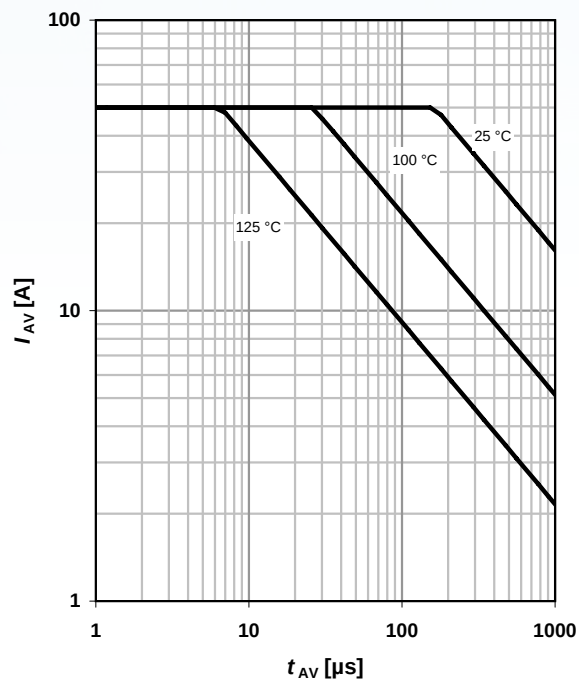
$$I_F = f(V_{SD})$$

parameter: T_j 

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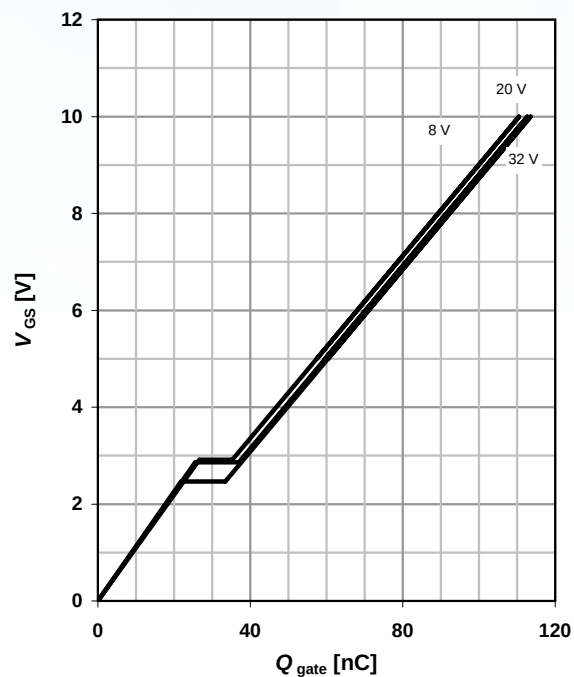
13 Avalanche characteristics

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

parameter: $T_{j(\text{start})}$ 

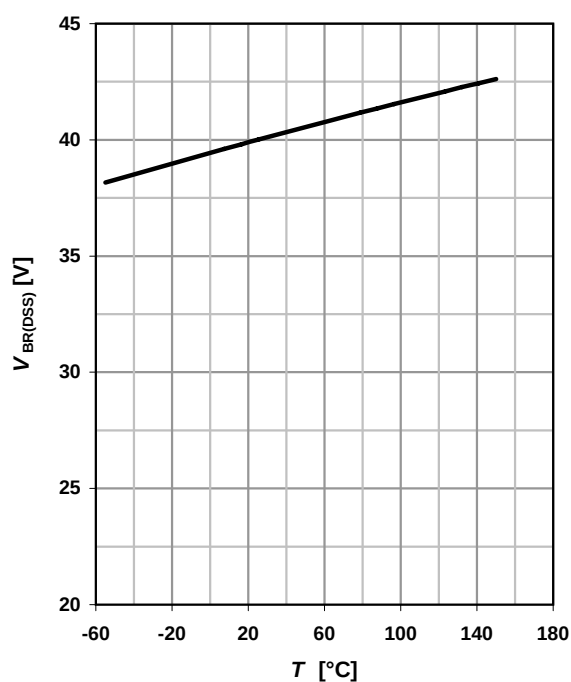
14 Typ. gate charge

$$V_{GS}=f(Q_{\text{gate}}); I_D=30\ \text{A pulsed}$$

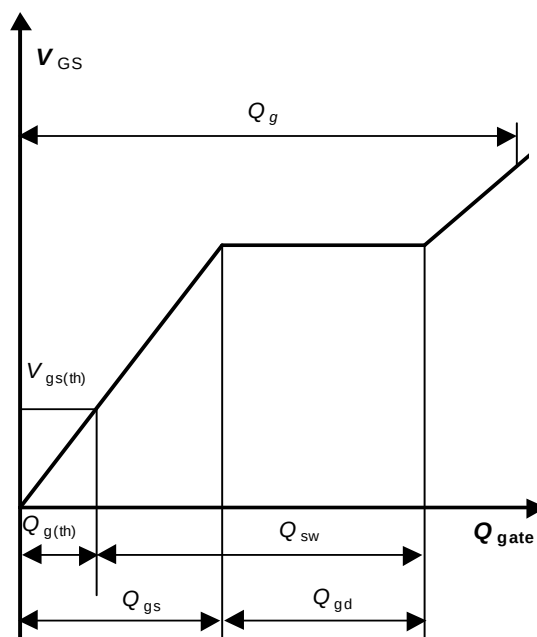
parameter: V_{DD} 

15 Drain-source breakdown voltage

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



16 Gate charge waveforms

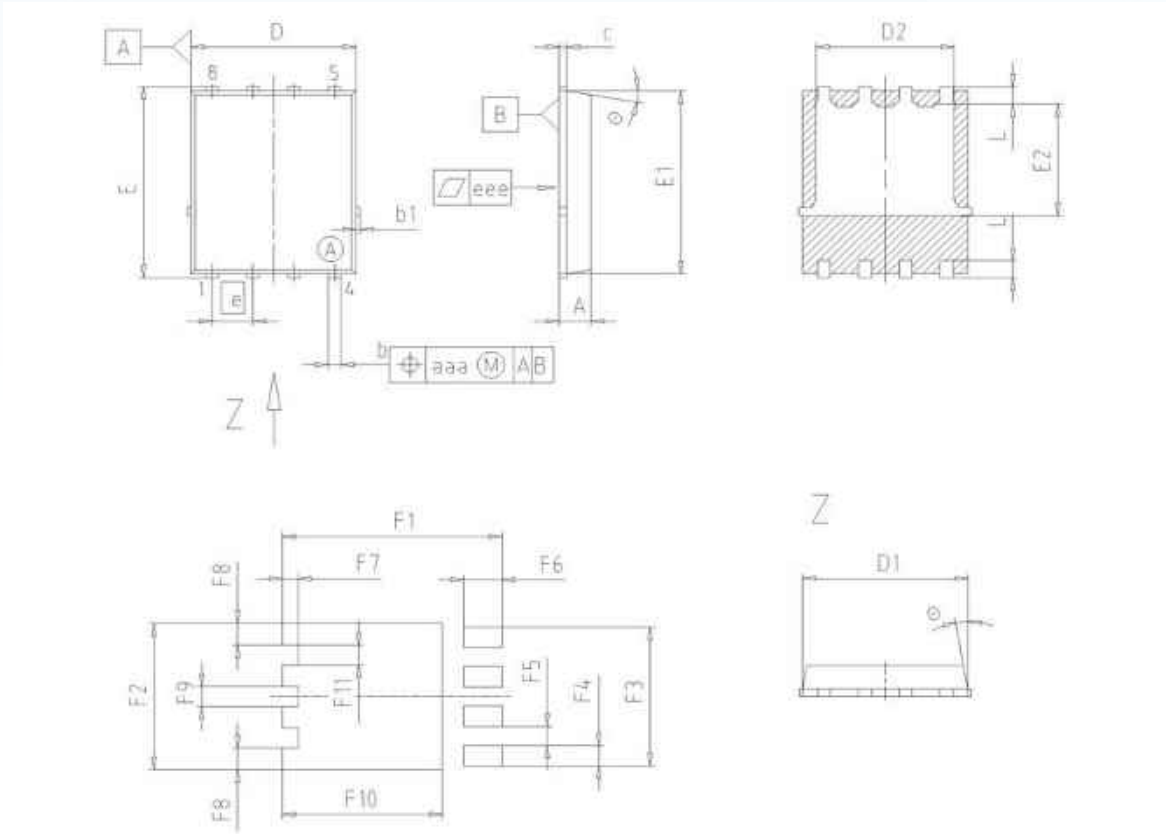


D N08D N

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Package Outline

PG-TDSON-8



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

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03

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