Infineon technologies

Preliminary Data

BSO 307N

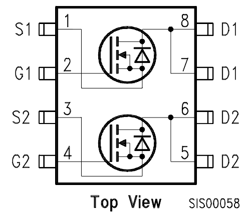
SIPMOS® Small-Signal-Transistor

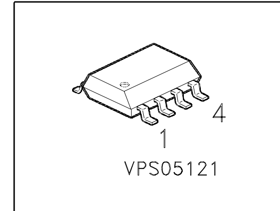
Features

- Dual N channel
- Enhancement mode
- Avalanche rated
- Logic Level
- d*v*/d*t* rated

Product Summary

Drain source voltage	V_{DS}	30	V
Drain-Source on-state resistance	$R_{DS(on)}$	0.05	Ω
Continuous drain current	I_D	5	A





Type	Package	Ordering Code
BSO 307 N	SO 8	Q67000-S4012

Maximum Ratings, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current, *one channel active* T_A = 25 °C	I_D	5	A
Pulsed drain current, *one channel active* T_A = 25 °C	I_{Dpulse}	20	
Avalanche energy, single pulse I_D = 5 A, V_{DD} = 25 V, R_{GS} = 25 Ω	E_{AS}	55	mJ
Avalanche current,periodic limited by T_{jmax}	I_{AR}	5	A
Avalanche energy, periodic limited by T_{jmax}	E_{AR}	0.2	mJ
Reverse diode d*v*/d*t* I_S = 5 A, V_{DS} = 24 V, d*i*/d*t* = 200 A/µs, T_{jmax} = 150 °C	d*v*/d*t*	6	kV/µs
Gate source voltage	V_{GS}	±20	V
Power dissipation, *one channel active* T_A = 25 °C	P_{tot}	2	W
Operating temperature	T_j	-55...+150	°C
Storage temperature	T_{stg}	-55 ... +150	
IEC climatic category; DIN IEC 68-1		55/150/56	

Downloaded from Elcodis.com electronic components distributor

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - soldering point	R_{thJS}	-	-	35	K/W
Thermal resistance @ 10 sec., min. footprint	$R_{th(JA)}$	-	-	100	
Thermal resistance @ 10 sec., 6 cm^2 cooling area [1)]	$R_{th(JA)}$	-	-	62.5	

Electrical Characteristics, at $T_j = 25$ ˚C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain- source breakdown voltage $V_{GS} = 0$ V, $I_D = 0.25$ mA, $T_j = 25$ ˚C	$V_{(BR)DSS}$	30	-	-	V
Gate threshold voltage, $V_{GS} = V_{DS}$ $I_D = 20$ µA	$V_{GS(th)}$	1.2	1.6	2	
Zero gate voltage drain current $V_{DS} = 30$ V, $V_{GS} = 0$ V, $T_j = 25$ ˚C $V_{DS} = 30$ V, $V_{GS} = 0$ V, $T_j = 150$ ˚C	I_{DSS}	 - -	 0.1 10	 1 100	µA
Gate-source leakage current $V_{GS} = 20$ V, $V_{DS} = 0$ V	I_{GSS}	-	10	100	nA
Drain-Source on-state resistance $V_{GS} = 4.5$ V, $I_D = 4.1$ A $V_{GS} = 10$ V, $I_D = 5$ A	$R_{DS(on)}$	 - -	 0.05 0.035	 0.075 0.05	Ω

[1] Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6 cm2 (one layer, 70µm thick) copper area for drain connection. PCB is vertical without blown air.

Downloaded from Elcodis.com electronic components distributor

Electrical Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Transconductance $V_{DS} \geq 2 * I_D * R_{DS(on)max}$, I_D = 4.1 A	g_{fs}	2	6	-	S
Input capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{iss}	-	400	500	pF
Output capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{oss}	-	160	200	
Reverse transfer capacitance V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	C_{rss}	-	70	90	
Turn-on delay time V_{DD} = 15 V, V_{GS} = 4.5 V, I_D = 4.1 A, R_G = 16 Ω	$t_{d(on)}$	-	22	33	ns
Rise time V_{DD} = 15 V, V_{GS} = 4.5 V, I_D = 4.1 A, R_G = 16 Ω	t_r	-	22	33	ns
Turn-off delay time V_{DD} = 15 V, V_{GS} = 4.5 V, I_D = 4.1 A, R_G = 16 Ω	$t_{d(off)}$	-	22	33	ns
Fall time V_{DD} = 15 V, V_{GS} = 4.5 V, I_D = 4.1 A, R_G = 16 Ω	t_f	-	25	38	ns

Downloaded from Elcodis.com electronic components distributor

Electrical Characteristics, at T_j = 25 ˚C, unless otherwise specified

Parameter	Symbol	Values			Unit
at T_j = 25 ˚C, unless otherwise specified		min.	typ.	max.	
Dynamic Characteristics					
Gate charge at threshold V_{DD} = 15 V, I_D = 0.1 A, V_{GS} = 0 to 1 V	$Q_{G(th)}$	-	0.4	0.6	nC
Gate charge at V_{gs}=5V V_{DD} = 15 V, I_D = 4.1 A, V_{GS} = 0 to 5 V	$Q_{g(5)}$	-	8	12	
Gate charge total V_{DD} = 15 V, I_D = 4.1 A, V_{GS} = 0 to 10 V	Q_g	-	13	20	nC
Gate plateau voltage V_{DD} = 15 V, I_D = 4.1 A	$V_{(plateau)}$	-	3.2	-	V

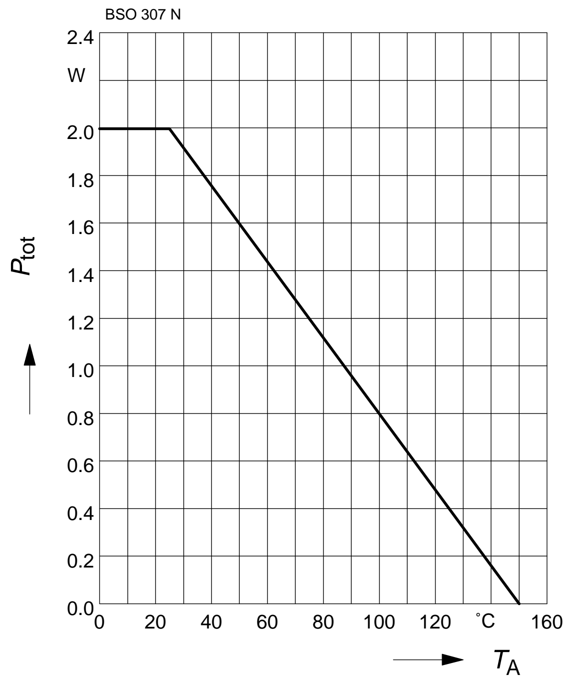
Reverse Diode

Parameter	Symbol	min.	typ.	max.	Unit
Inverse diode continuous forward current T_A = 25 ˚C	I_S	-	-	5	A
Inverse diode direct current,pulsed T_A = 25 ˚C	I_{SM}	-	-	20	
Inverse diode forward voltage V_{GS} = 0 V, I_F = 10 A	V_{SD}	-	0.85	1.4	V
Reverse recovery time V_R = 15 V, I_F=I_S , di_F/dt = 100 A/µs	t_{rr}	-	25	38	ns
Reverse recovery charge V_R = 15 V, I_F=I_S , di_F/dt = 100 A/µs	Q_{rr}	-	20	30	µC

Downloaded from Elcodis.com electronic components distributor

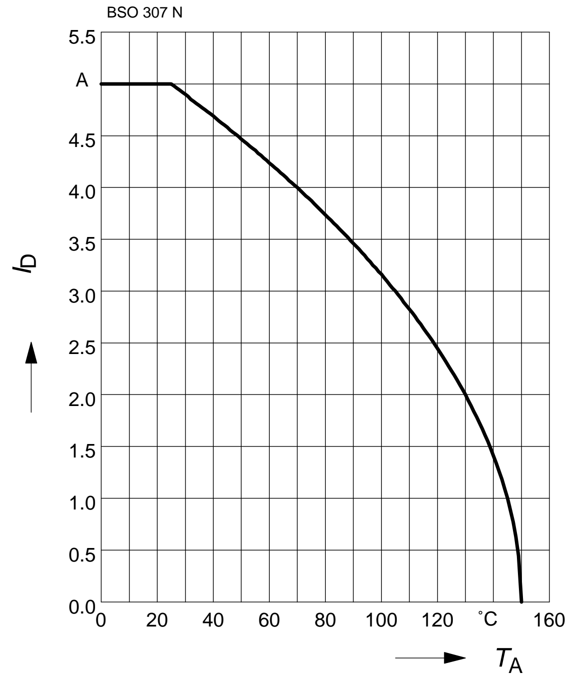
Power dissipation

$P_{tot} = f(T_A)$



Drain current

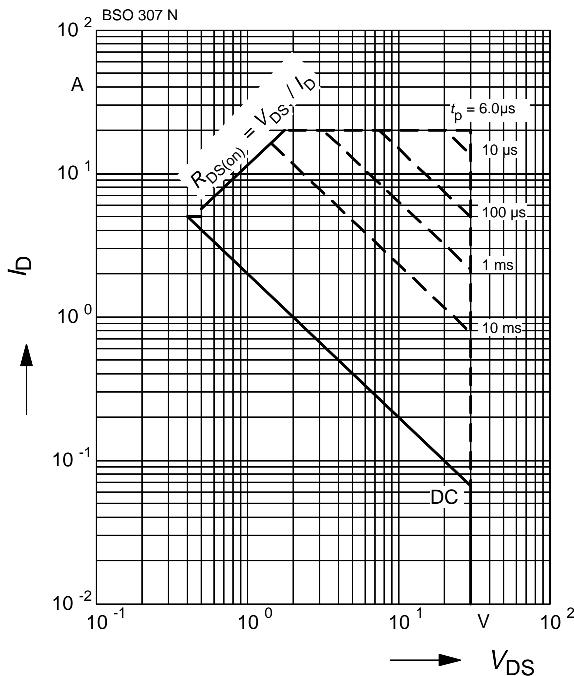
$I_D = f(T_A)$



Safe operating area

$I_D = f(V_{DS})$

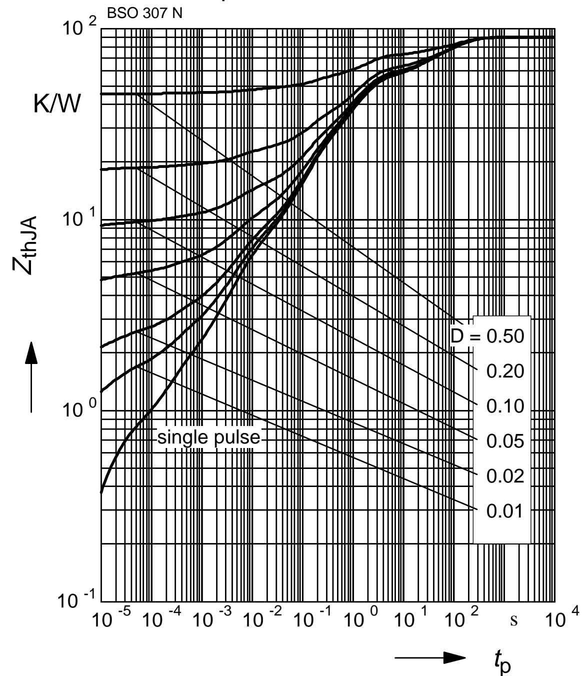
parameter : $D = 0$, $T_A = 25$ °C



Transient thermal impedance

$Z_{thJA} = f(t_p)$

parameter : $D = t_p/T$

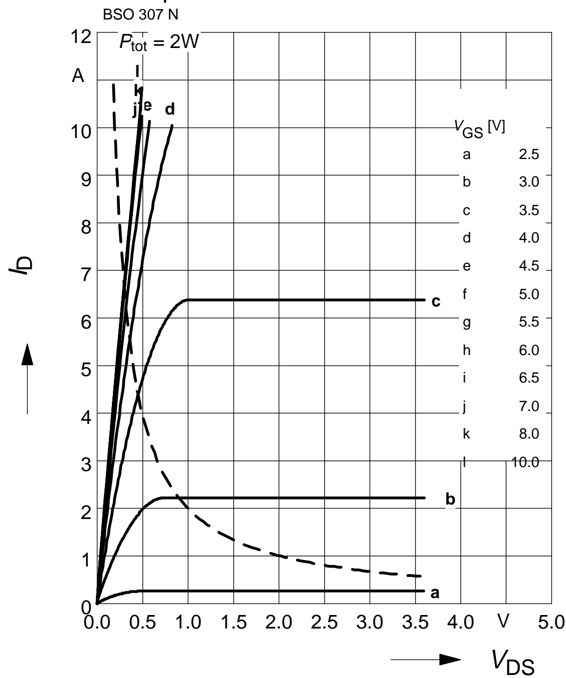


Downloaded from Elcodis.com electronic components distributor

Typ. output characteristics

$I_D = f(V_{DS})$

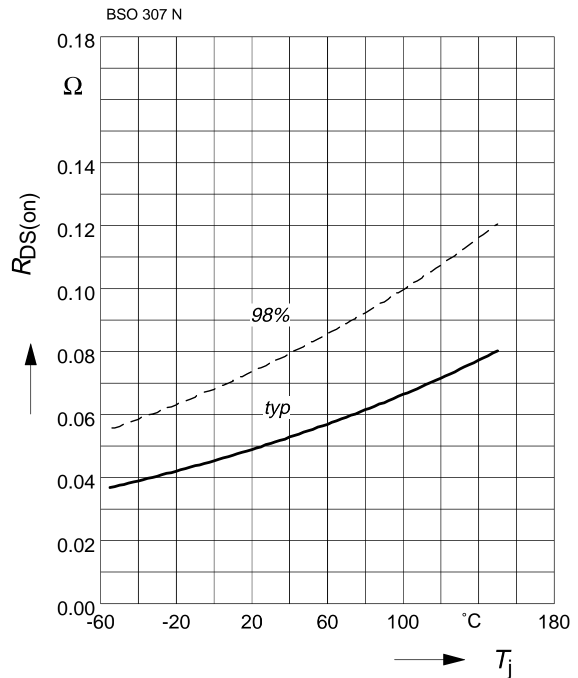
parameter: t_p = 80 µs



Drain-source on-resistance

$R_{DS(on)} = f(T_j)$

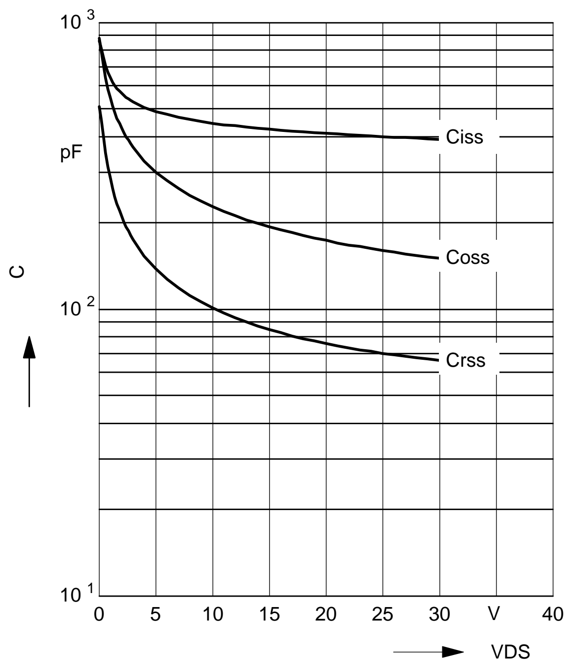
parameter : I_D = 4.1 A, V_{GS} = 4.5 V



Typ. capacitances

C = $f(V_{DS})$

parameter: V_{GS} = 0 V, f = 1 MHz

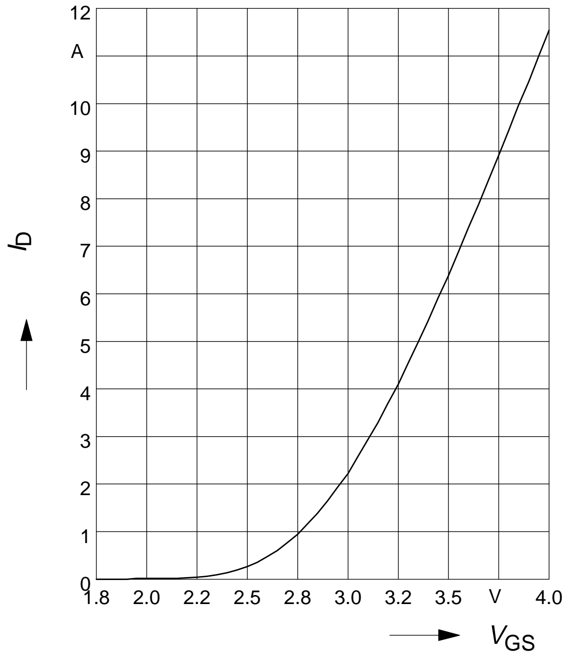


Downloaded from Elcodis.com electronic components distributor

Typ. transfer characteristics $I_D = f(V_{GS})$

parameter: t_p = 80 µs

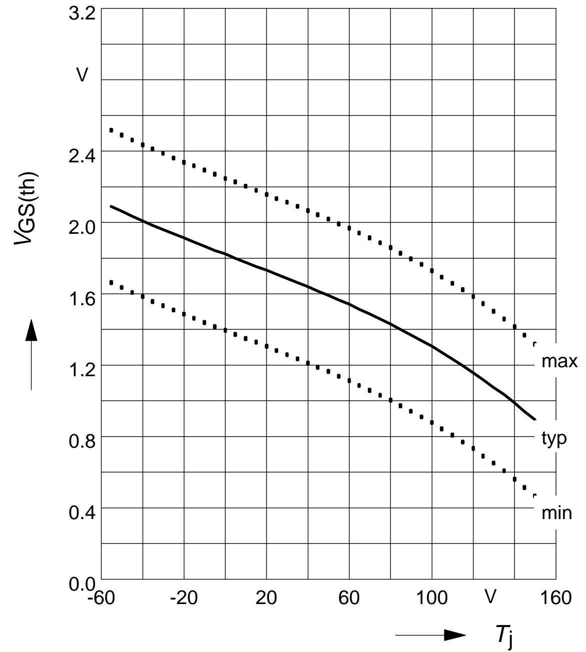
$V_{DS} \geq 2 \times I_D \times R_{DS(on)\,max}$



Gate threshold voltage

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

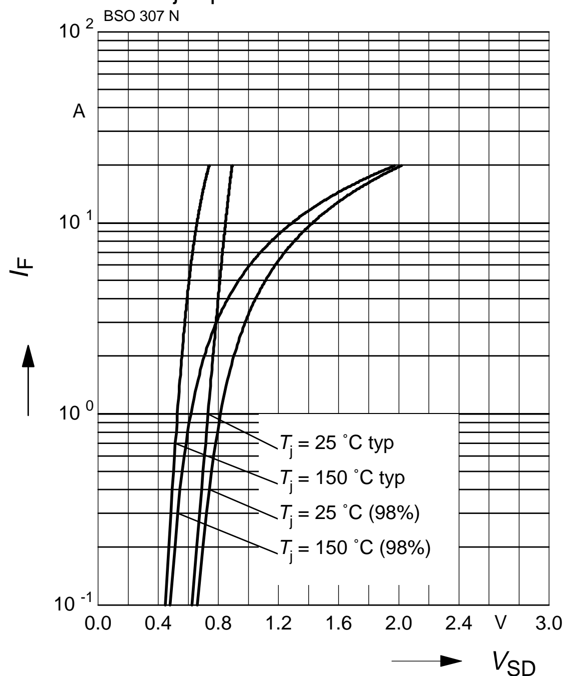
parameter : $V_{GS} = V_{DS}$, I_D = 20 µA



Forward characteristics of reverse diode

$I_F = f(V_{SD})$

parameter: T_j , t_p = 80 µs

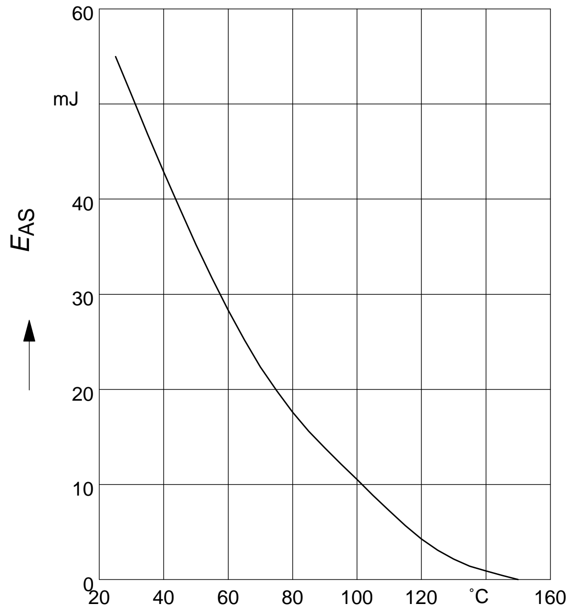


Downloaded from Elcodis.com electronic components distributor

Avalanche Energy $E_{AS} = f(T_j)$

parameter: I_D = 5 A, V_{DD} = 25 V

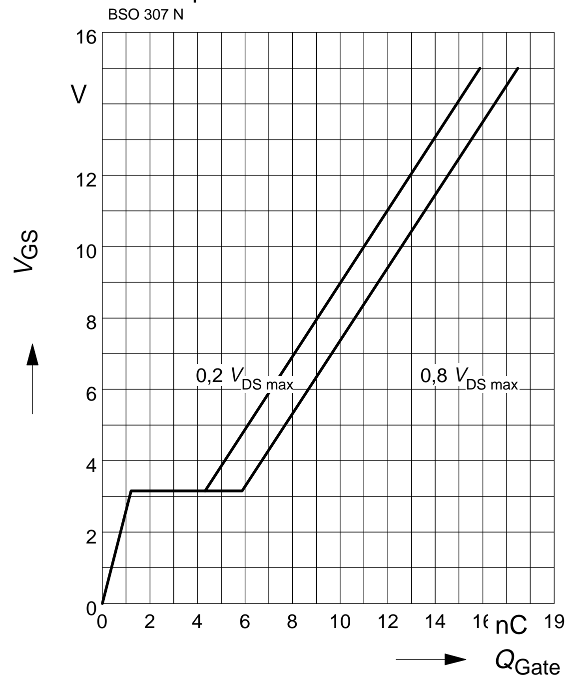
R_{GS} = 25 Ω



Typ. gate charge

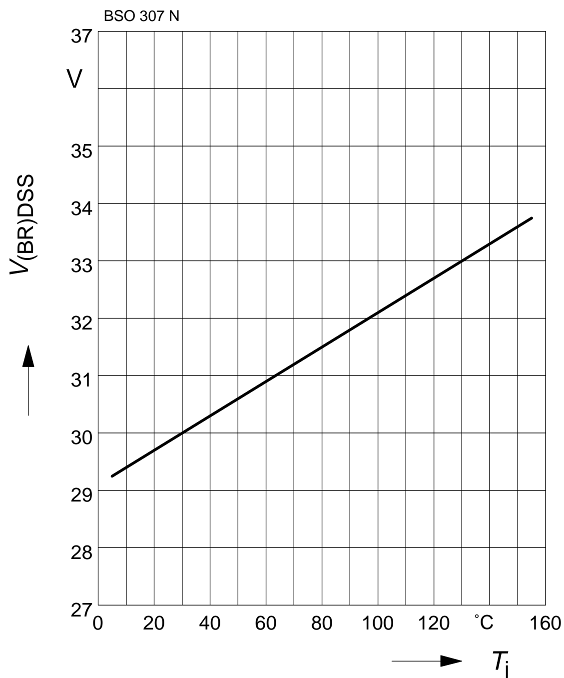
$V_{GS} = f(Q_{Gate})$

parameter: $I_{D\ puls}$ = 4.1 A



Drain-source breakdown voltage

$V_{(BR)DSS} = f(T_j)$



Downloaded from Elcodis.com electronic components distributor