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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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SIPMOS® Small-Signal-Transistor

Feature

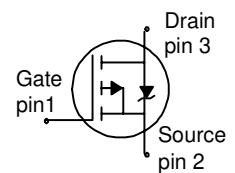
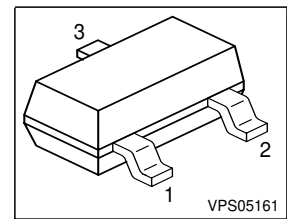
- P-Channel
- Enhancement mode
- Logic Level
- Avalanche rated
- dv/dt rated
- Pb-free lead plating; RoHS compliant
- Qualified according to AEC Q101
- Halogen-free according to IEC61249-2-21



Product Summary

V_{DS}	-60	V
$R_{DS(on)}$	8	Ω
I_D	-0.17	A

PG-SOT-23



Type	Package	Tape and Reel	Marking
BSS 84 P	PG-SOT-23	H6327:3000pcs/r.	YBs
BSS 84 P	PG-SOT-23	H6433:10000pcs/r.	YBs

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

Parameter	Symbol	Value	Unit
Continuous drain current	I_D		A
$T_A=25\text{ }^\circ\text{C}$		-0.17	
$T_A=70\text{ }^\circ\text{C}$		-0.14	
Pulsed drain current	$I_{D\text{ puls}}$	-0.68	
$T_A=25\text{ }^\circ\text{C}$			
Avalanche energy, single pulse	E_{AS}	2.6	mJ
$I_D=-0.17\text{ A}$, $V_{DD}=-25\text{ V}$, $R_{GS}=25\text{ }\Omega$			
Avalanche energy, periodic limited by T_{jmax}	E_{AR}	0.036	
Reverse diode dv/dt	dv/dt	-6	kV/ μs
$I_S=-0.17\text{ A}$, $V_{DS}=-48\text{ V}$, $di/dt=-200\text{ A}/\mu\text{s}$, $T_{jmax}=150\text{ }^\circ\text{C}$			
Gate source voltage	V_{GS}	± 20	V
Power dissipation	P_{tot}	0.36	W
$T_A=25\text{ }^\circ\text{C}$			
Operating and storage temperature	T_j, T_{stg}	-55... +150	$^\circ\text{C}$
IEC climatic category; DIN IEC 68-1		55/150/56	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - soldering point (Pin 3)	R_{thJS}	-	-	200	K/W
SMD version, device on PCB: @ min. footprint	R_{thJA}	-	-	350	
@ 6 cm ² cooling area ¹⁾		-	-	300	

Electrical Characteristics, at $T_A = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage $V_{GS}=0, I_D=-250\mu A$	$V_{(BR)DSS}$	-60	-	-	V
Gate threshold voltage, $V_{GS} = V_{DS}$ $I_D=-20\mu A$	$V_{GS(th)}$	-1	-1.5	-2	
Zero gate voltage drain current $V_{DS}=-60V, V_{GS}=0, T_A=25\text{ °C}$ $V_{DS}=-60V, V_{GS}=0, T_A=125\text{ °C}$	I_{DSS}	-	-0.1	-1	μA
		-	-10	-100	
Gate-source leakage current $V_{GS}=-20V, V_{DS}=0$	I_{GSS}	-	-10	-100	nA
Drain-source on-state resistance $V_{GS}=-4.5V, I_D=-0.14A$	$R_{DS(on)}$	-	8	12	Ω
Drain-source on-state resistance $V_{GS}=-10V, I_D=-0.17A$	$R_{DS(on)}$	-	5.8	8	

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

Electrical Characteristics, at $T_A = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic Characteristics

Transconductance	g_{fs}	$V_{DS} \leq 2 \cdot I_D \cdot R_{DS(on)max}$, $I_D = -0.14\text{A}$	0.065	0.13	-	S
Input capacitance	C_{iss}	$V_{GS} = 0$, $V_{DS} = -25\text{V}$, $f = 1\text{MHz}$	-	15	19	pF
Output capacitance	C_{oss}		-	6	8	
Reverse transfer capacitance	C_{rss}		-	2	3	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = -30\text{V}$, $V_{GS} = -4.5\text{V}$, $I_D = -0.14\text{A}$, $R_G = 25\Omega$	-	6.7	10	ns
Rise time	t_r		-	16.2	24.3	
Turn-off delay time	$t_{d(off)}$		-	8.6	12.9	
Fall time	t_f		-	20.5	30.8	

Gate Charge Characteristics

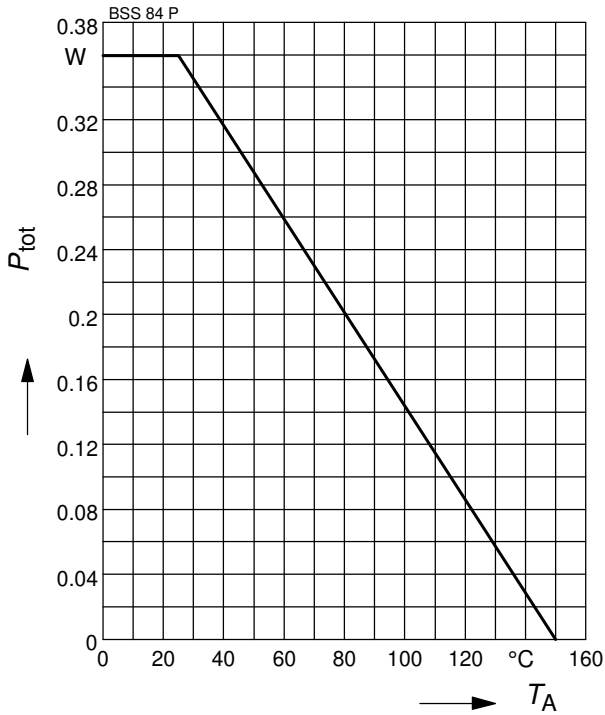
Gate to source charge	Q_{gs}	$V_{DD} = -48\text{V}$, $I_D = -0.17\text{A}$	-	0.25	0.37	nC
Gate to drain charge	Q_{gd}		-	0.3	0.45	
Gate charge total	Q_g	$V_{DD} = -48\text{V}$, $I_D = -0.17\text{A}$, $V_{GS} = 0$ to -10V	-	1	1.5	
Gate plateau voltage	$V_{(plateau)}$	$V_{DD} = -48\text{V}$, $I_D = -0.17\text{A}$	-	-3.42	-	V

Reverse Diode

Inverse diode continuous forward current	I_S	$T_A = 25\text{ °C}$	-	-	-0.17	A
Inv. diode direct current, pulsed	I_{SM}		-	-	-0.68	
Inverse diode forward voltage	V_{SD}	$V_{GS} = 0$, $I_F = -0.17\text{A}$	-	-0.93	-1.24	V
Reverse recovery time	t_{rr}	$V_R = -30\text{V}$, $I_F = I_S$, $di_F/dt = 100\text{A}/\mu\text{s}$	-	23	34	ns
Reverse recovery charge	Q_{rr}		-	10	15	

1 Power dissipation

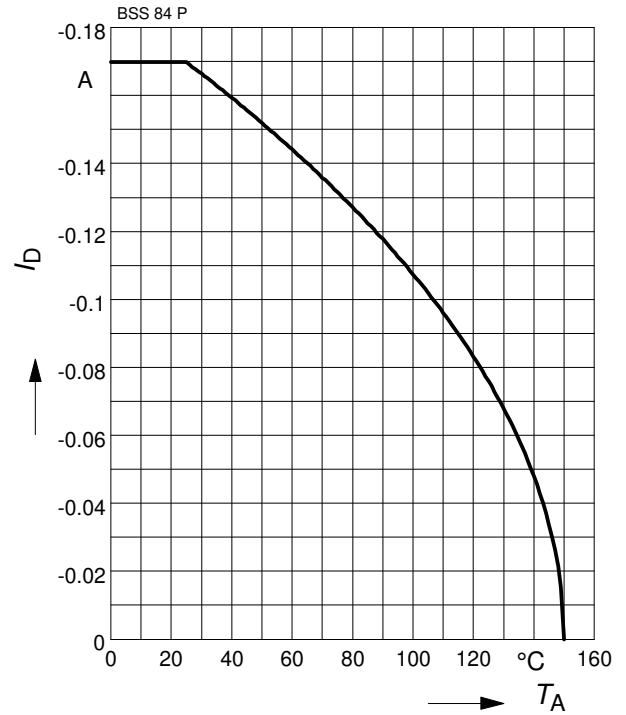
$$P_{\text{tot}} = f(T_A)$$



2 Drain current

$$I_D = f(T_A)$$

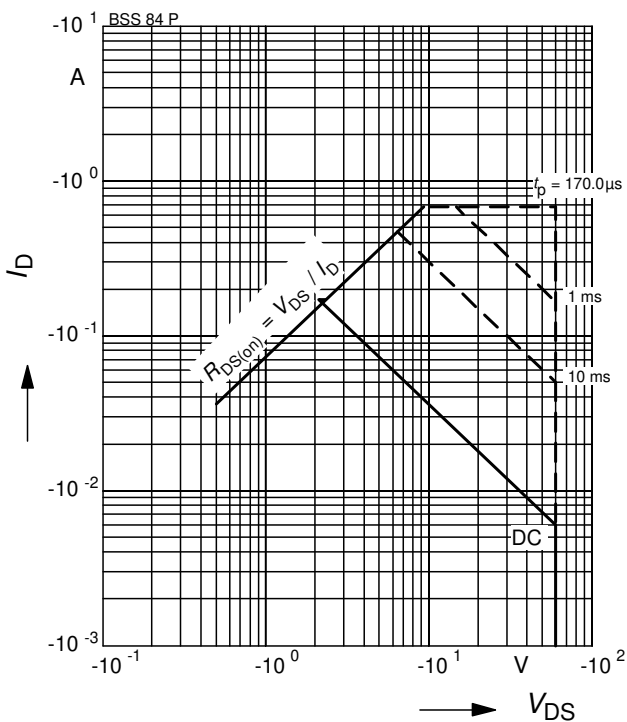
parameter: $V_{GS} \geq 10 \text{ V}$



3 Safe operating area

$$I_D = f(V_{DS})$$

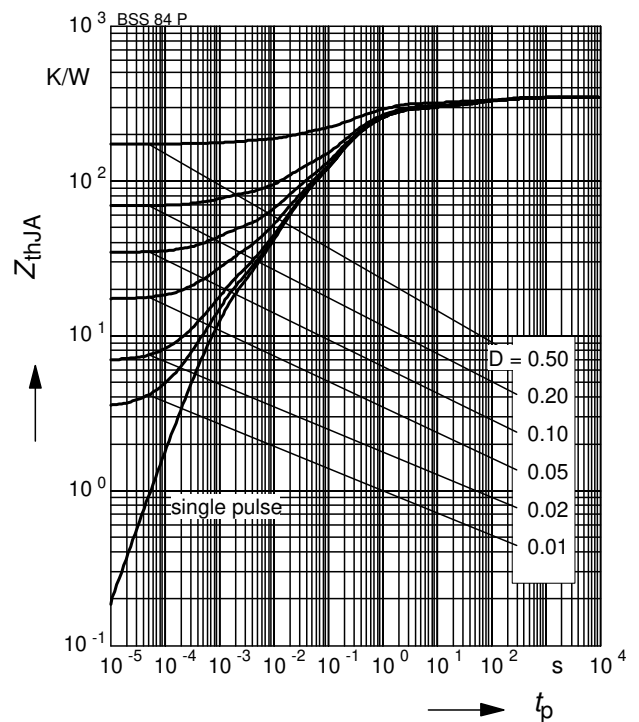
parameter: $D = 0$, $T_A = 25 \text{ °C}$



4 Transient thermal impedance

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

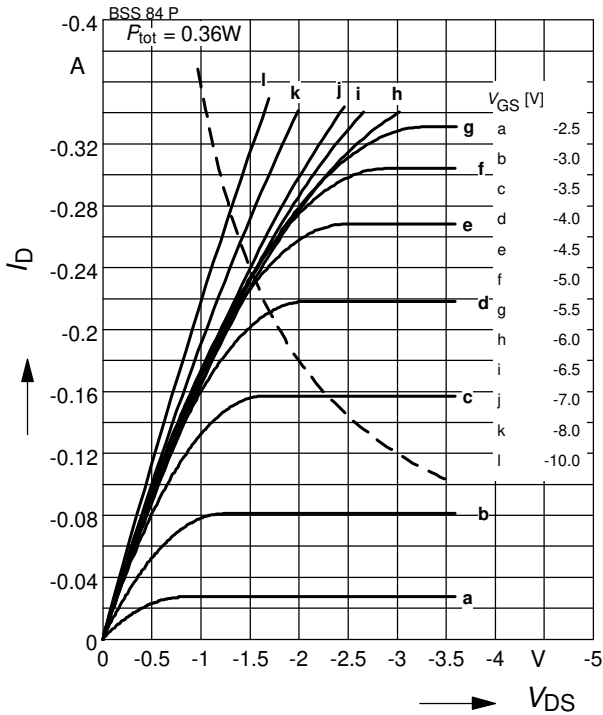
parameter: $D = t_p/T$



5 Typ. output characteristic

$$I_D = f(V_{DS})$$

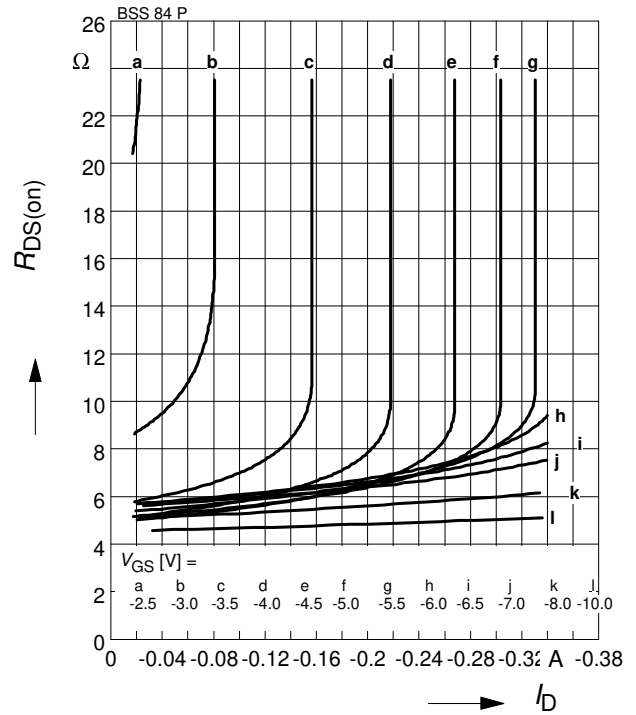
parameter: $T_j = 25\text{ }^\circ\text{C}$



6 Typ. drain-source on resistance

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

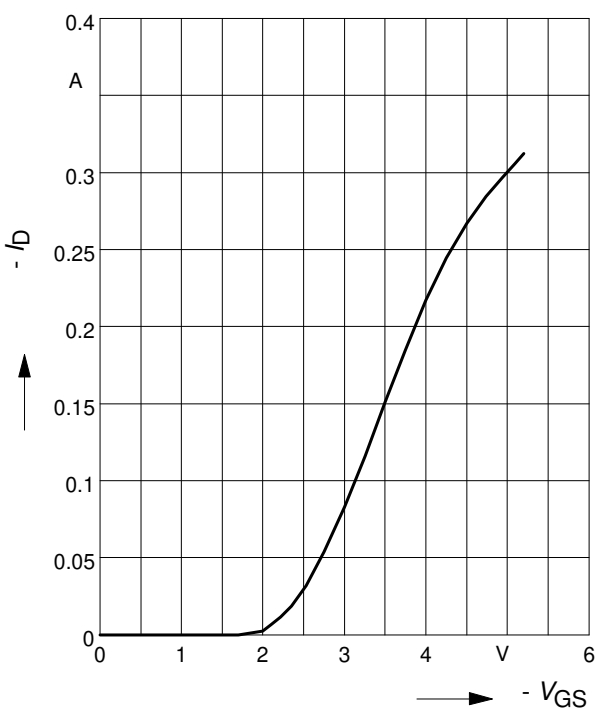
parameter: V_{GS} ; $T_j = 25\text{ }^\circ\text{C}$



7 Typ. transfer characteristics

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

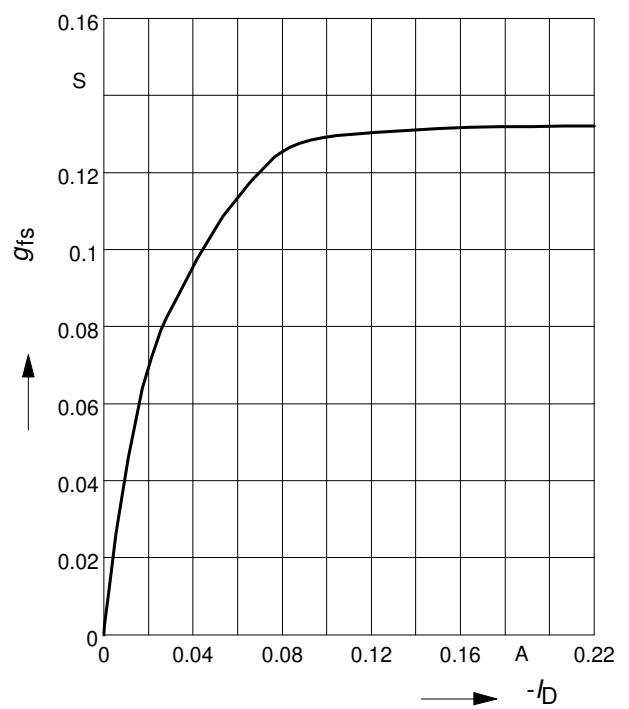
parameter: $T_j = 25\text{ }^\circ\text{C}$



8 Typ. forward transconductance

$$g_{fs} = f(I_D)$$

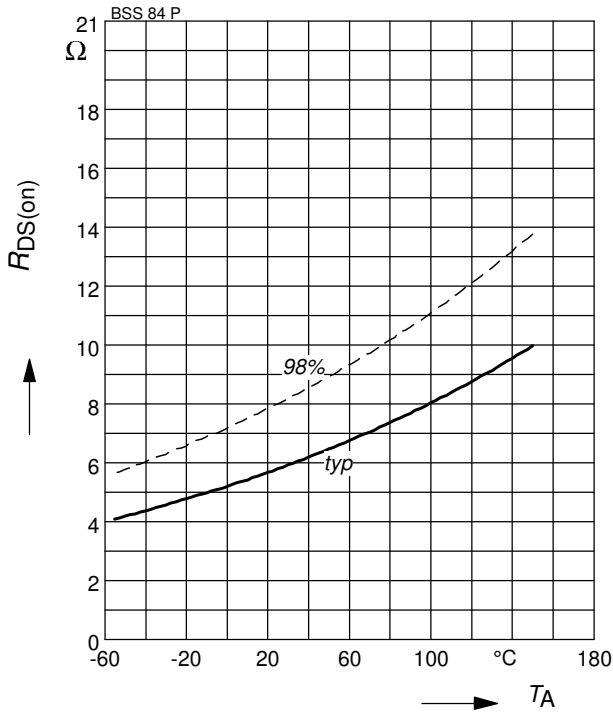
parameter: $T_j = 25\text{ }^\circ\text{C}$



9 Drain-source on-state resistance

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

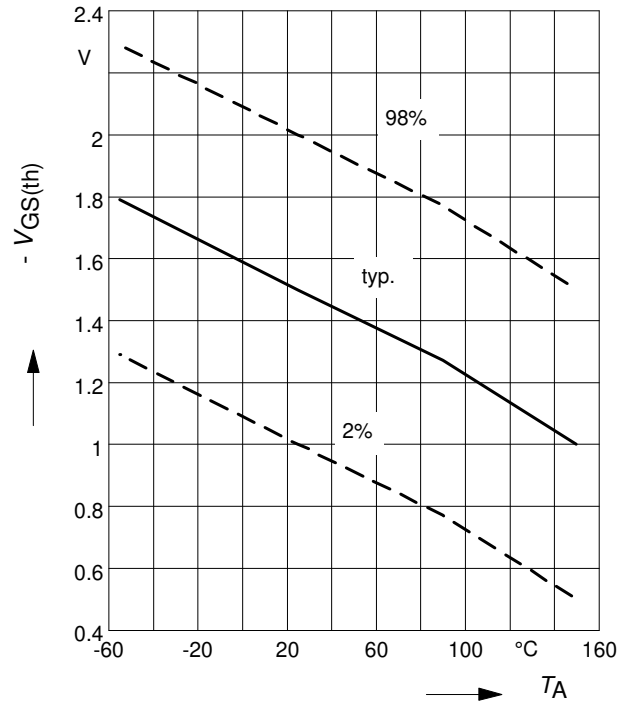
parameter: $I_D = -0.17\text{ A}$, $V_{GS} = -10\text{ V}$



10 Typ. gate threshold voltage

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

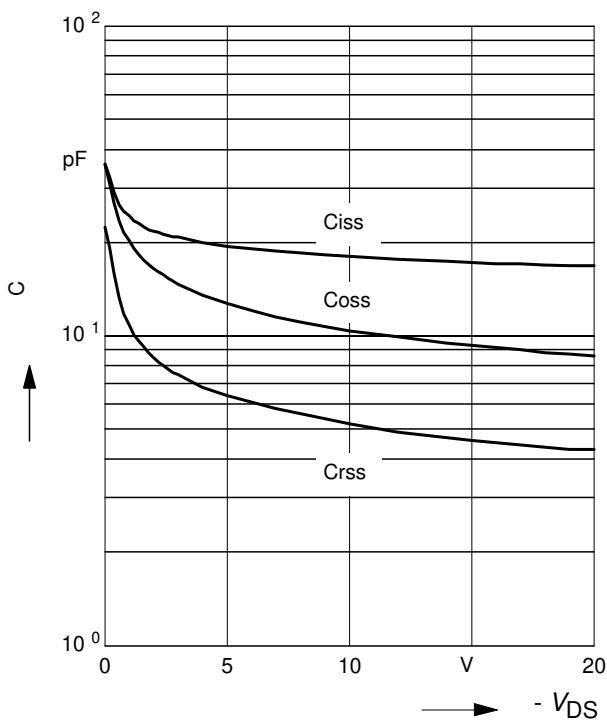
parameter: $V_{GS} = V_{DS}$



11 Typ. capacitances

$$C = f(V_{DS})$$

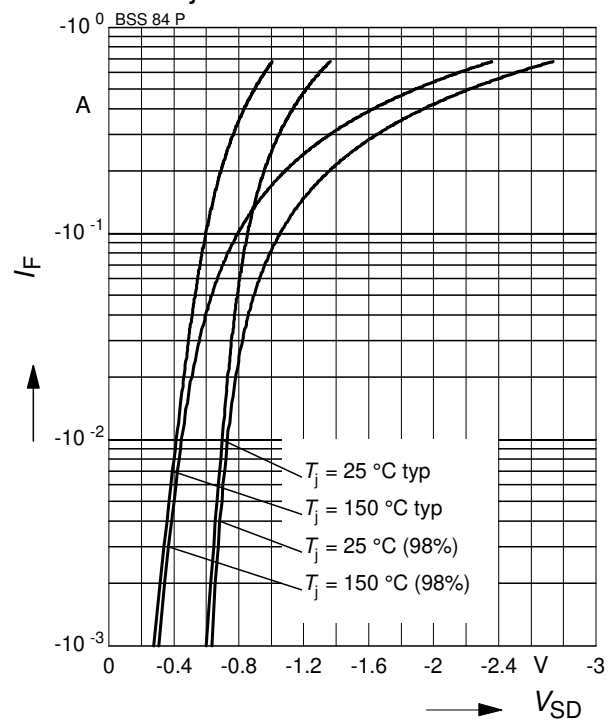
parameter: $V_{GS} = 0$, $f = 1\text{ MHz}$



12 Forward character. of reverse diode

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

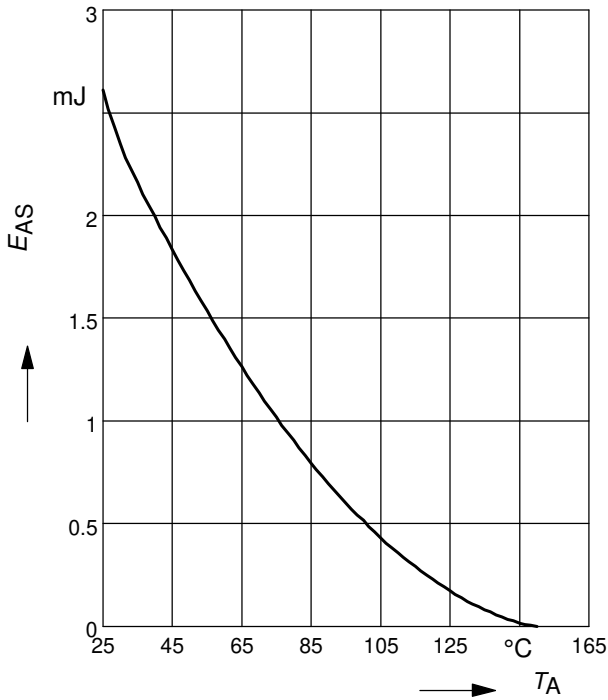
parameter: T_j , $t_p = 80\text{ }\mu\text{s}$



13 Typ. avalanche energy

$E_{AS} = f(T_A)$, parameter:

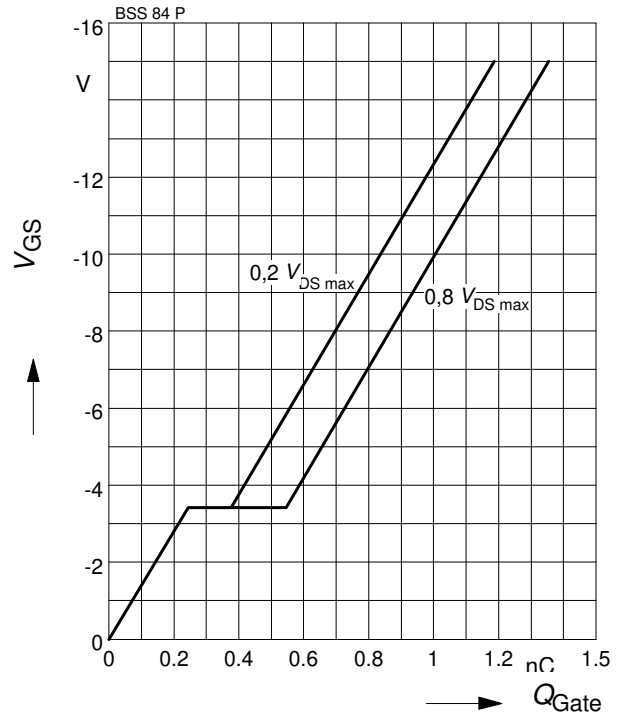
$I_D = -0.17\text{ A}$, $V_{DD} = -25\text{ V}$, $R_{GS} = 25\ \Omega$



14 Typ. gate charge

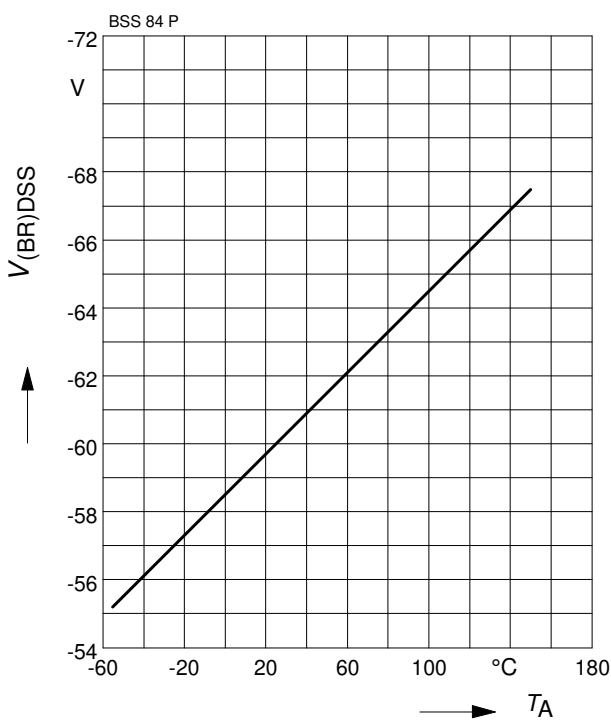
$V_{GS} = f(Q_{Gate})$

parameter: $I_D = -0.17\text{ A}$ pulsed; $T_j = 25\text{ °C}$



15 Drain-source breakdown voltage

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



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