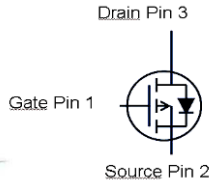
SIPMOS® Small-Signal-Transistor

Product Summary

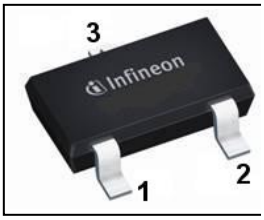
V_{DS}	-60	V
$R_{DS(on),max}$	0.8	Ω
I_D	-0.62	A

Features

- P-Channel
- Enhancement mode
- Logic level
- Footprint and pinning compatible with SOT-23 / SuperSOT-23 packages
- Avalanche rated
- Pb-free lead finishing; RoHS compliant
- Qualified according to AEC Q101
- Halogen free according to IEC61249-2-21



SC-59



Type	Package	Tape and reel information	Marking	Halogen-free	Packing
BSR315P	PG-SC59	H6327 = 3000 pcs. / reel	LB	Yes	Non dry

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

Parameter	Symbol	Conditions	Value	Unit
			steady state	
Continuous drain current	I_D	T_A=25 °C	-0.62	A
		T_A=70 °C	-0.49	
Pulsed drain current	$I_{D,pulse}$	T_A=25 °C	-2.48	
Avalanche energy, single pulse	E_{AS}	I_D=0.62 A, R_{GS}=25 Ω	24	mJ
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_A=25 °C	0.5	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150	°C
ESD class		JESD22-C101	1A (250V to 500V)	
Soldering temperature			260 °C	
IEC climatic category; DIN IEC 68-1			55/150/56	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - ambient	R_{thJA}	minimal footprint, steady state	-	-	250	K/W
Electrical characteristics, at T_j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=-250 µA	-60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-160 µA	-1	-1.5	-2	
Zero gate voltage drain current	I_{DSS}	V_{DS}=-60 V, V_{GS}=0 V, T_j=25 °C	-	-0.1	-1	µA
		V_{DS}=-60 V, V_{GS}=0 V, T_j=150 °C	-	-10	-100	
Gate-source leakage current	I_{GSS}	V_{GS}=-20 V, V_{DS}=0 V	-	-10	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=-4.5 V, I_D=-0.49 A	-	870	1300	mΩ
		V_{GS}=-10 V, I_D=-0.62 A	-	620	800	
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=-0.49 A	0.5	0.9	-	S

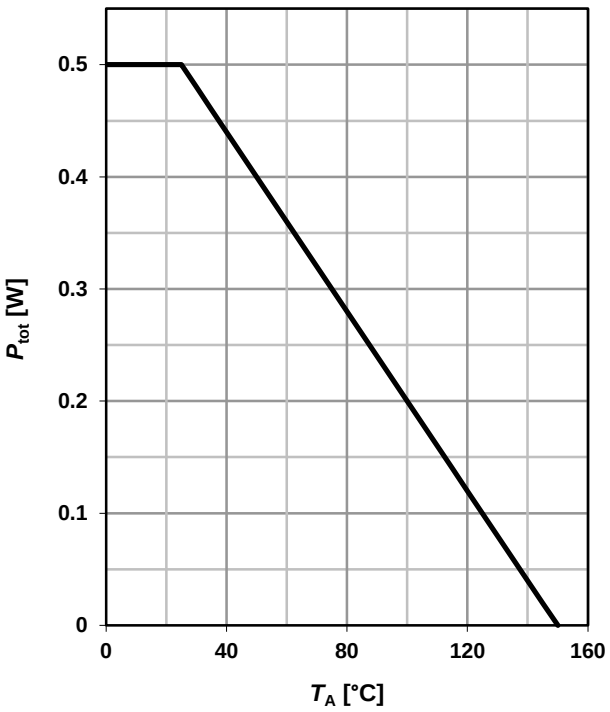
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics[2]						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=-25 V, f=1 MHz	-	132	176	pF
Output capacitance	C_{oss}		-	42	56	
Reverse transfer capacitance	C_{rss}		-	20	30	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-30 V, V_{GS}=-10 V, I_D=-0.62 A, $R_{G,ext}$=6 Ω	-	8	13	ns
Rise time	t_r		-	28	46	
Turn-off delay time	$t_{d(off)}$		-	21	32	
Fall time	t_f		-	20	30	
Gate Charge Characteristics[1),2)]						
Gate to source charge	Q_{gs}	V_{DD}=-48 V, I_D=-0.62 A, V_{GS}=0 to -10 V	-	0.4	0.5	nC
Gate to drain charge	Q_{gd}		-	2	3	
Gate charge total	Q_g		-	4	6	
Gate plateau voltage	$V_{plateau}$		-	-3	-	V
Reverse Diode						
Diode continuous forward current	I_S	T_A=25 °C	-	-	-0.56	A
Diode pulse current	$I_{S,pulse}$		-	-	-2.5	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=-0.62 A, T_j=25 °C	-	-0.82	-1.2	V
Reverse recovery time[2)]	t_{rr}	V_R=-30 V, I_F=$\|I_S\|$, di_F/dt=100 A/µs	-	32	48	ns
Reverse recovery charge[2)]	Q_{rr}		-	29	43	nC

[2)] Defined by design. Not subjected to production test

[1)] See figure 16 for gate charge parameter definition

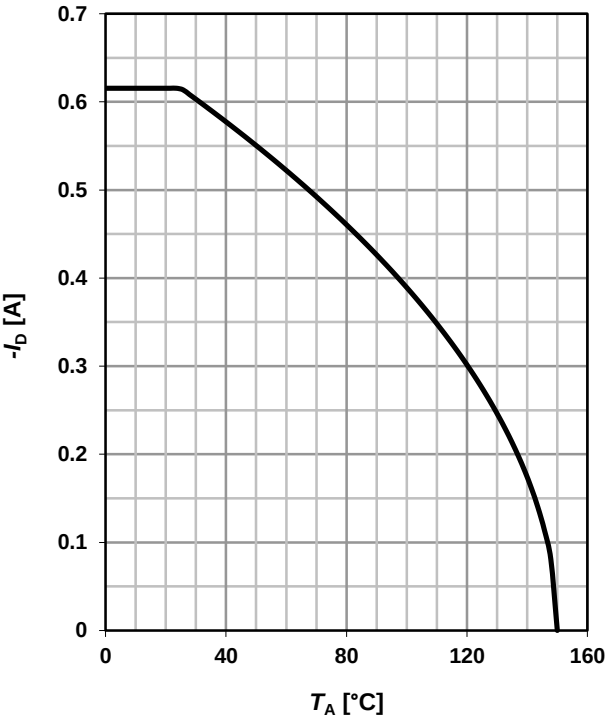
1 Power dissipation

$P_{tot}=f(T_A)$



2 Drain current

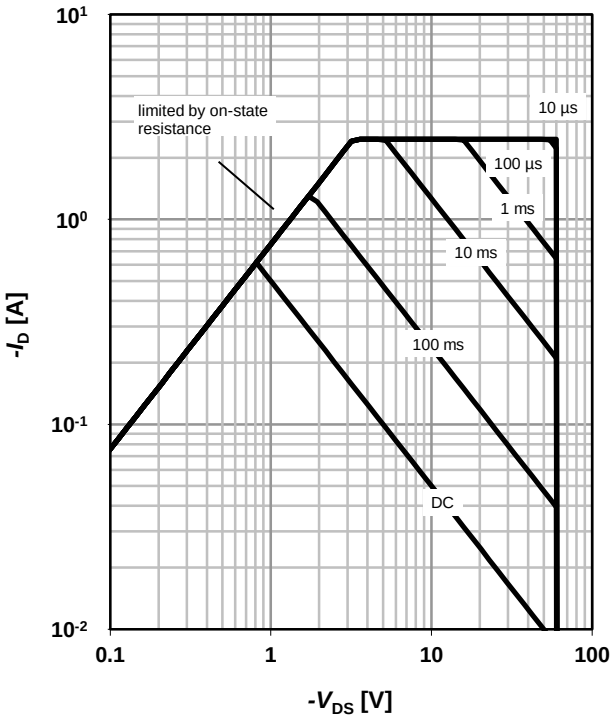
$I_D=f(T_A)$; $|V_{GS}|\geq 10$ V



3 Safe operating area

$I_D=f(V_{DS})$; $T_A=25$ °C; $D=0$

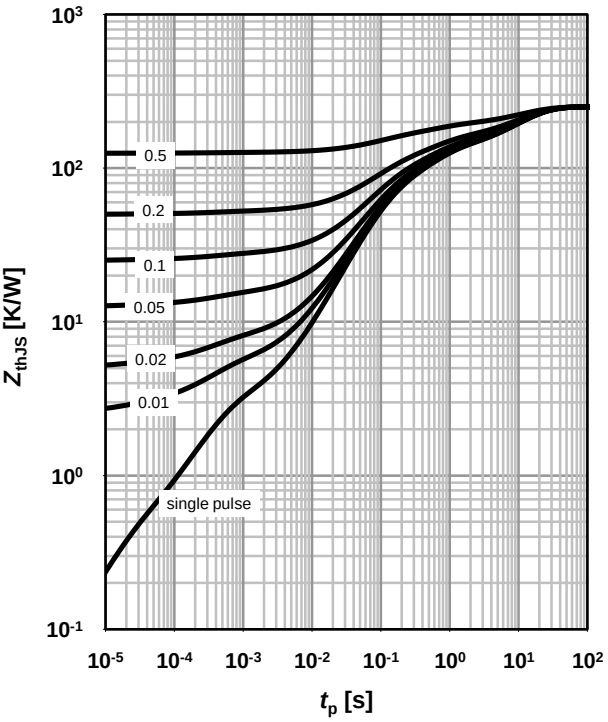
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJA}=f(t_p)$

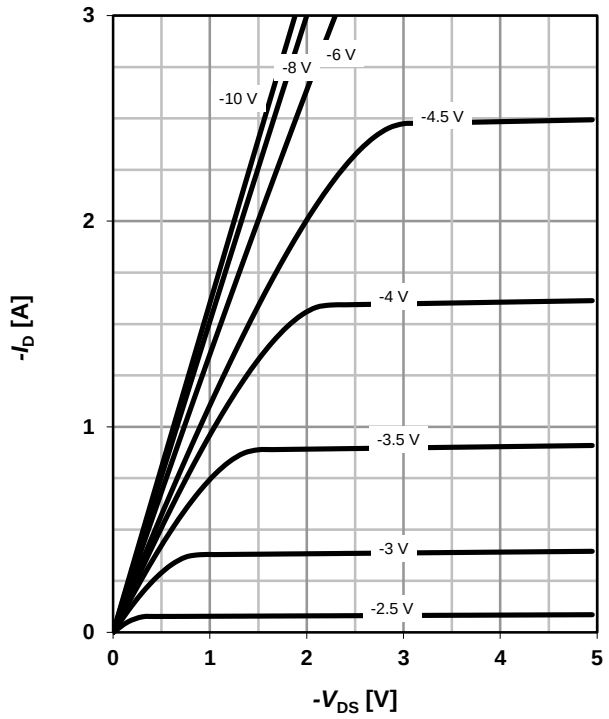
parameter: $D=t_p/T$



5 Typ. output characteristics

$I_D=f(V_{DS})$; $T_j=25$ °C

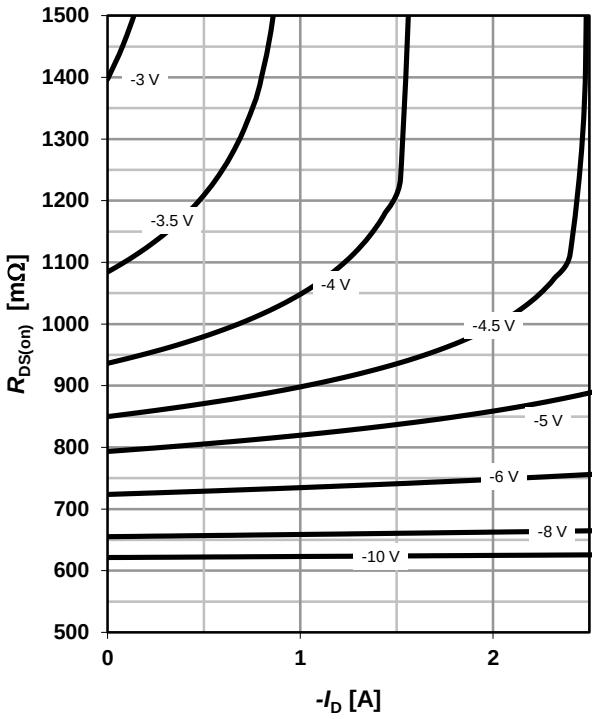
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)}=f(I_D)$; $T_j=25$ °C

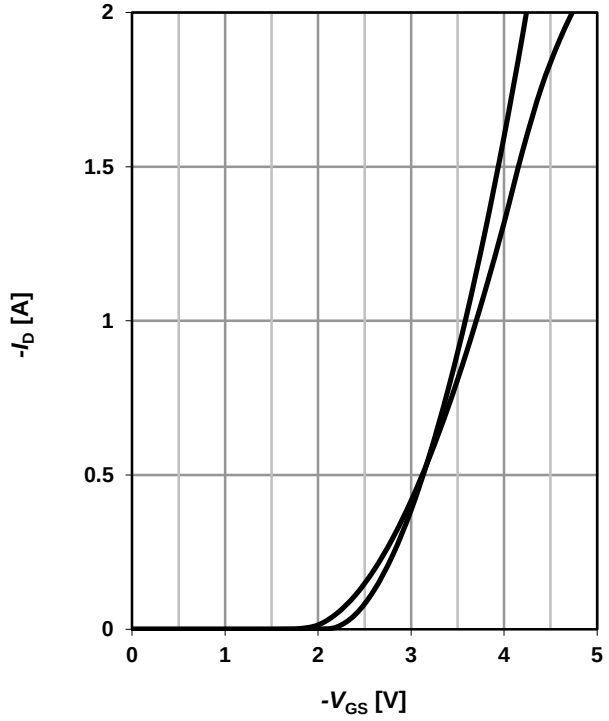
parameter: V_{GS}



7 Typ. transfer characteristics

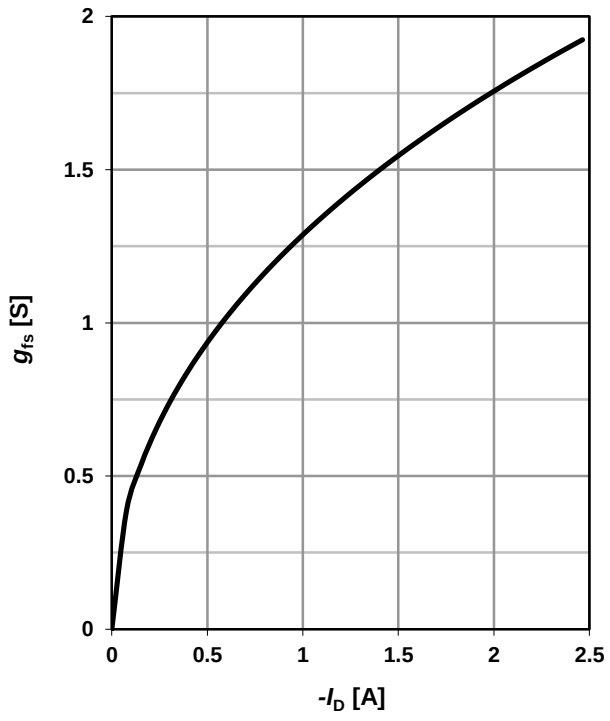
$I_D=f(V_{GS})$; $|V_{DS}|>2|I_D|R_{DS(on)max}$

parameter: T_j



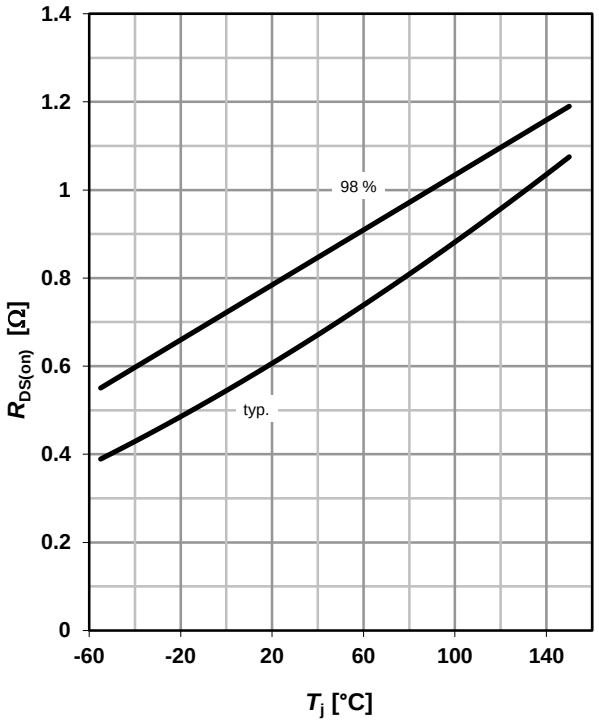
8 Typ. forward transconductance

$g_{fs}=f(I_D)$; $T_j=25$ °C



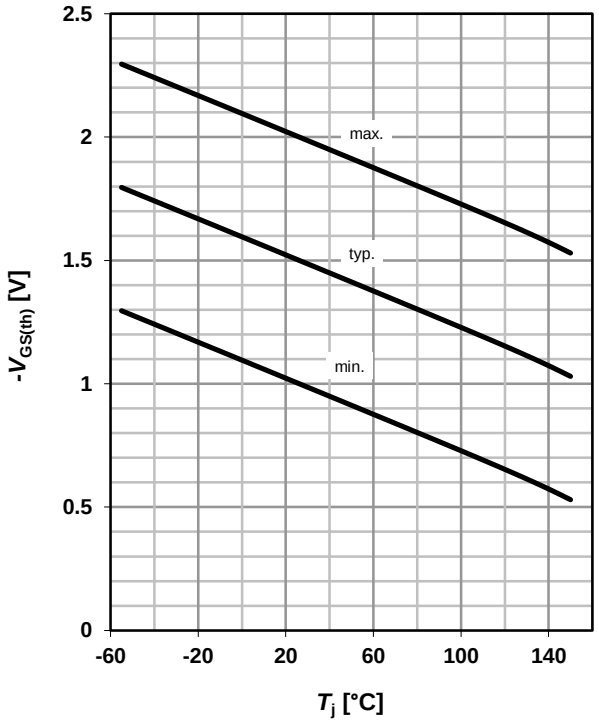
9 Drain-source on-state resistance

$R_{DS(on)}$=f(T_j); I_D=-0.62 A; V_{GS}=-10 V



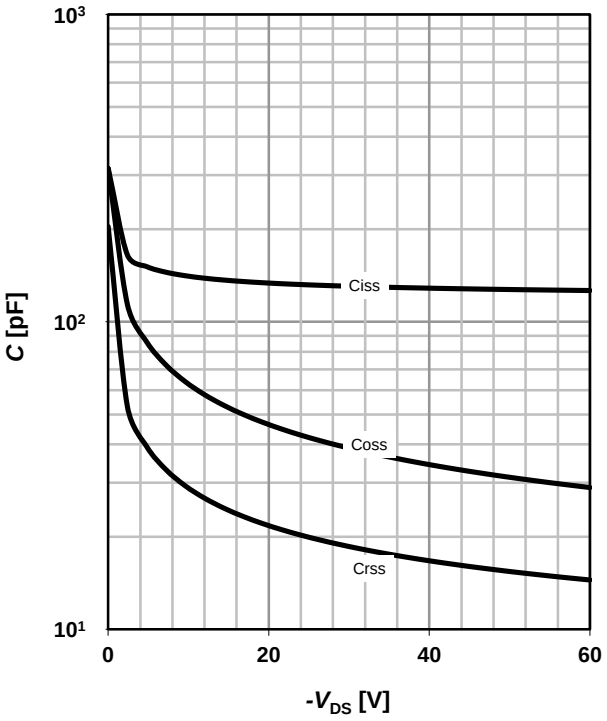
10 Typ. gate threshold voltage

$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}; I_D=-160 µA



11 Typ. capacitances

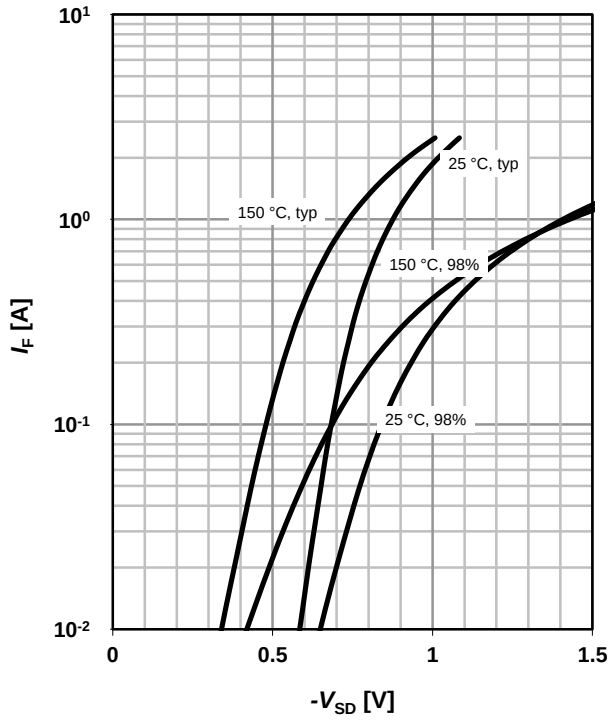
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz



12 Forward characteristics of reverse diode

I_F=f(V_{SD})

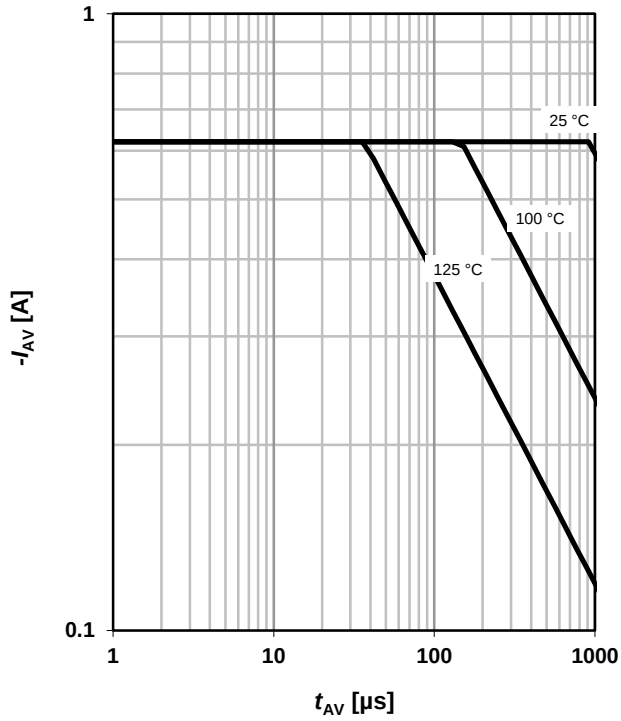
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

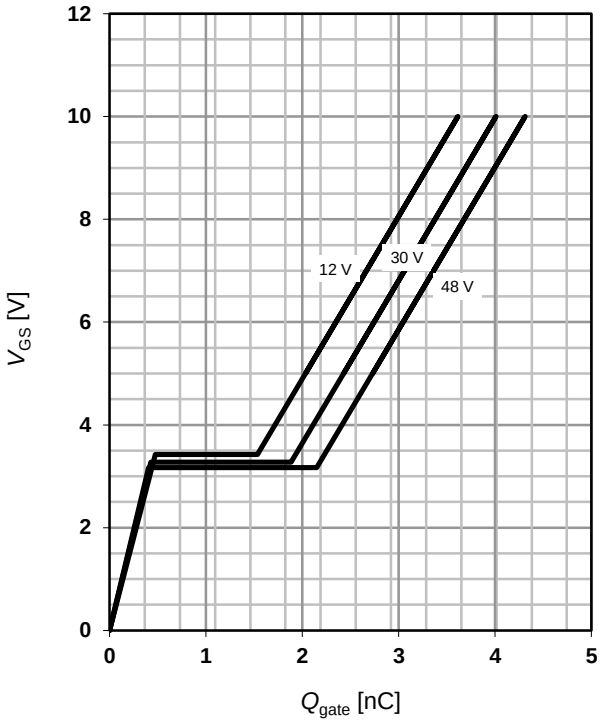
parameter: $T_{j(start)}$



14 Typ. gate charge

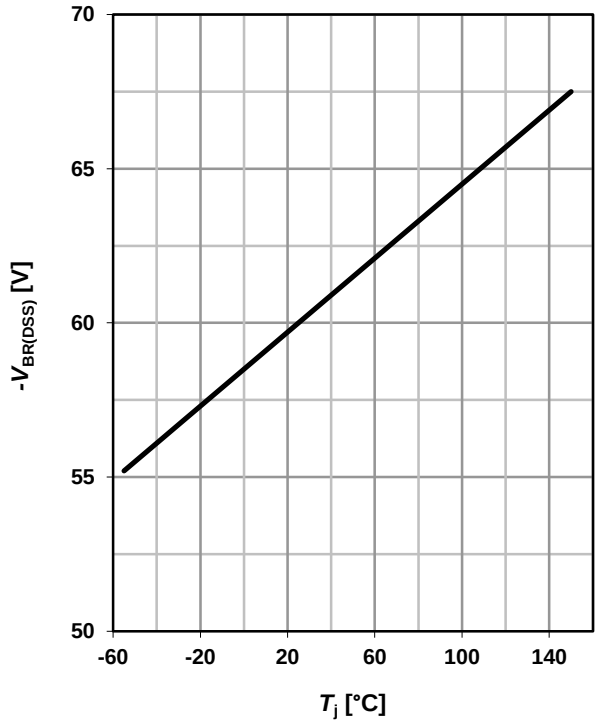
V_{GS}=f(Q_{gate}); I_D=-0.62 A pulsed

parameter: V_{DD}

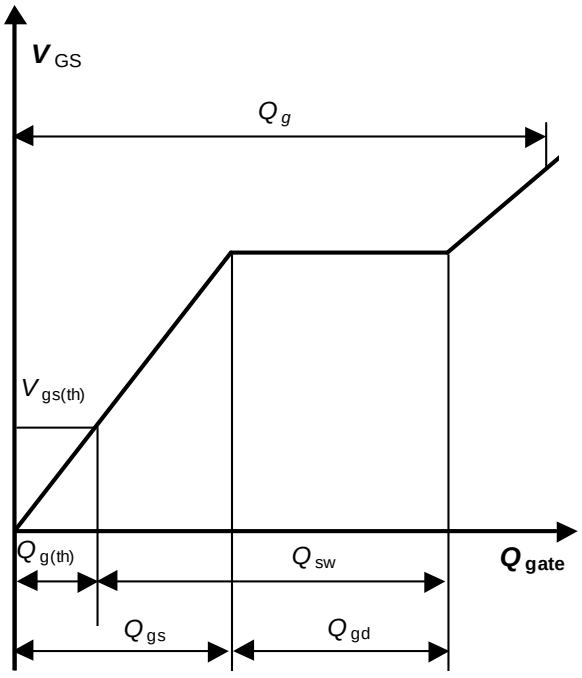


15 Drain-source breakdown voltage

$V_{BR(DSS)}$=f(T_j); I_D=-250 µA

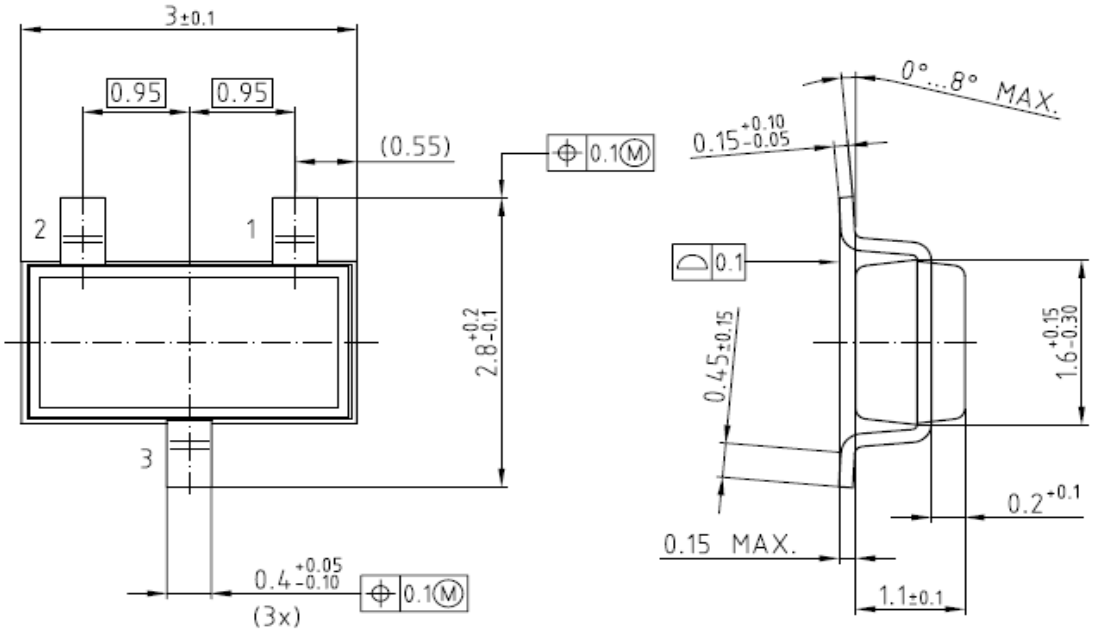


16 Gate charge waveforms

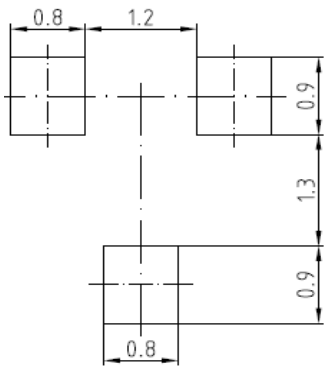


Package Outline

SC-59: Outline

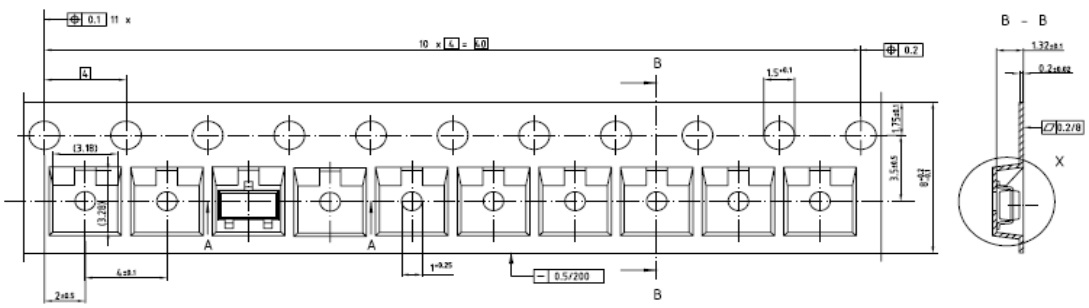


Footprint



Packaging

Tape



Dimensions in mm

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