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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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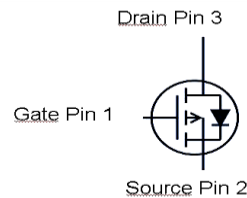
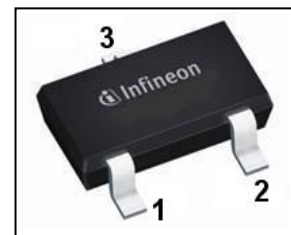


**SIPMOS<sup>®</sup> Small-Signal-Transistor**
**Features**

- P-Channel
- Enhancement mode / Logic level
- Avalanche rated
- Pb-free lead plating; RoHS compliant
- Footprint compatible to SOT23
- Qualified according to AEC Q101
- Halogen free according to IEC61249-2-21

**Product Summary**

$V_{DS}$	-100	V
$R_{DS(on),max}$	1.8	$\Omega$
$I_D$	-0.36	A


**PG-SC59**


Type	Package	Tape and Reel Information	Marking	Halogen-free	Packing
BSR316P	PG-SC59	H6327 = 3000 pcs. / reel	LC	Yes	Non dry

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

Parameter	Symbol	Conditions	Value	Unit
			steady state	
Continuous drain current	$I_D$	$T_A=25\text{ °C}$	-0.36	A
		$T_A=70\text{ °C}$	-0.29	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ °C}$	-1.44	
Avalanche energy, single pulse	$E_{AS}$	$I_D=-0.36\text{ A}$ , $R_{GS}=25\ \Omega$	25	mJ
Gate source voltage	$V_{GS}$		$\pm 20$	V
Power dissipation	$P_{tot}$	$T_C=25\text{ °C}$	0.5	W
Operating and storage temperature	$T_j$ , $T_{stg}$		-55 ... 150	$^{\circ}\text{C}$
ESD class		JESD22-A114-HBM	1A (250V to 500V)	
Soldering temperature			260 $^{\circ}\text{C}$	
IEC climatic category; DIN IEC 68-1			55/150/56	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Thermal characteristics**

Thermal resistance, junction - ambient	$R_{thJA}$	minimal footprint, steady state	-	-	250	K/W
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**Electrical characteristics, at  $T_j=25\text{ °C}$ , unless otherwise specified**
**Static characteristics**

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}$ , $I_D=-250\text{ }\mu\text{A}$	-	-	-100	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ , $I_D=-170\text{ }\mu\text{A}$	-2	-1.5	-1	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-100\text{ V}$ , $V_{GS}=0\text{ V}$ , $T_j=25\text{ °C}$	-	-0.1	-1	$\mu\text{A}$
		$V_{DS}=-100\text{ V}$ , $V_{GS}=0\text{ V}$ , $T_j=150\text{ °C}$	-	-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	$R_{DS(on)}$	$V_{GS}=-4.5\text{ V}$ , $I_D=-0.33\text{ A}$	-	1.8	2.2	$\Omega$
		$V_{GS}=-10\text{ V}$ , $I_D=-0.36\text{ A}$	-	1.3	1.8	
Transconductance	$g_{fs}$	$ V_{DS} >2 I_D R_{DS(on)max}$ , $I_D=-0.29\text{ A}$	0.3	0.5	-	S

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Dynamic characteristics<sup>3)</sup>**

Input capacitance	$C_{iss}$	$V_{GS}=0\text{ V}, V_{DS}=-25\text{ V},$ $f=1\text{ MHz}$	-	124	165	pF
Output capacitance	$C_{oss}$		-	25	33	
Reverse transfer capacitance	$C_{rss}$		-	13	20	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=-50\text{ V},$ $V_{GS}=-10\text{ V},$ $I_D=-0.36\text{ A}, R_{G,ext}=6\ \Omega$	-	5	8	ns
Rise time	$t_r$		-	6	9	
Turn-off delay time	$t_{d(off)}$		-	71	106	
Fall time	$t_f$		-	26	39	

**Gate Charge Characteristics<sup>2), 3)</sup>**

Gate to source charge	$Q_{gs}$	$V_{DD}=-80\text{ V},$ $I_D=-0.36\text{ A}, V_{GS}=0\text{ to }-10\text{ V}$	-	0.3	0.4	nC
Gate to drain charge	$Q_{gd}$		-	1.6	2.4	
Gate charge total	$Q_g$		-	5.3	7.0	
Gate plateau voltage	$V_{plateau}$		-	-2.7	-	V

**Reverse Diode**

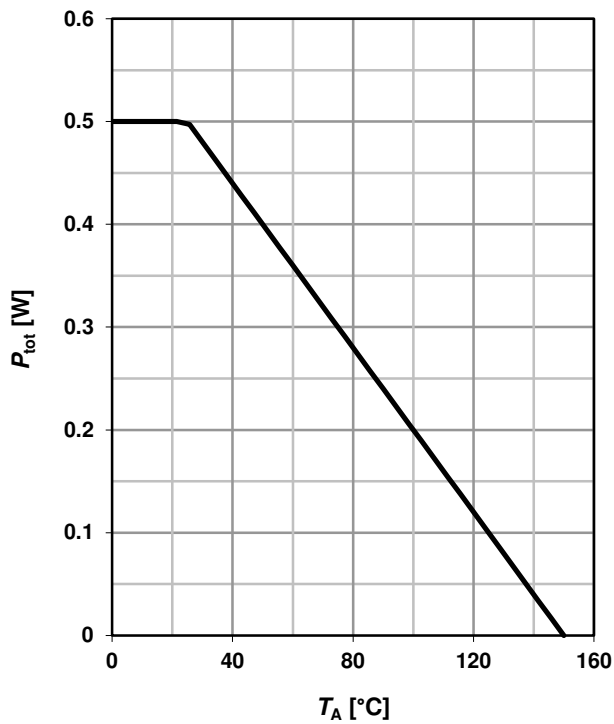
Diode continuous forward current	$I_S$	$T_C=25\text{ °C}$	-	-	-0.36	A
Diode pulse current	$I_{S,pulse}$		-	-	-1.44	
Diode forward voltage	$V_{SD}$	$V_{GS}=0\text{ V}, I_F=0.36\text{ A},$ $T_j=25\text{ °C}$	-	-0.8	-1.1	V
Reverse recovery time <sup>3)</sup>	$t_{rr}$	$V_R=-50\text{ V}, I_F= I_S ,$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	40.6	-	ns
Reverse recovery charge <sup>3)</sup>	$Q_{rr}$		-	46.4	-	nC

<sup>2)</sup> See figure 16 for gate charge parameter definition

<sup>3)</sup> Defined by design. Not subjected to production test

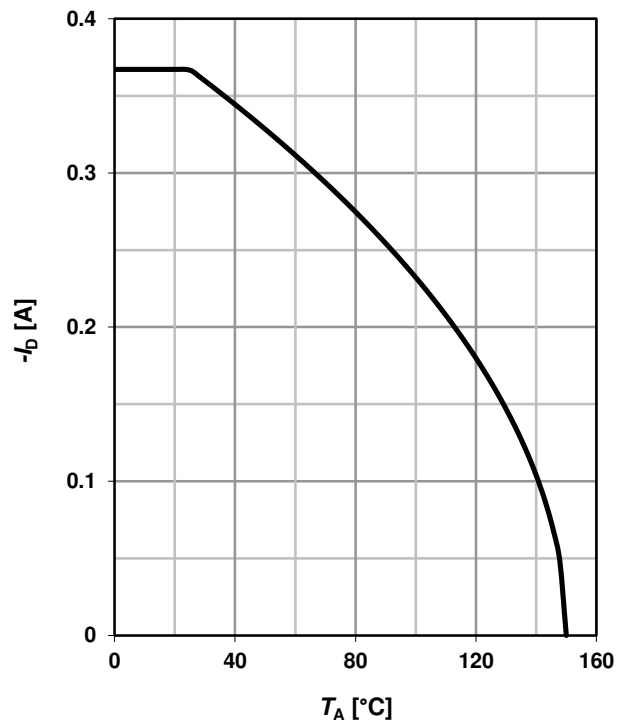
### 1 Power dissipation

$$P_{tot}=f(T_C)$$



### 2 Drain current

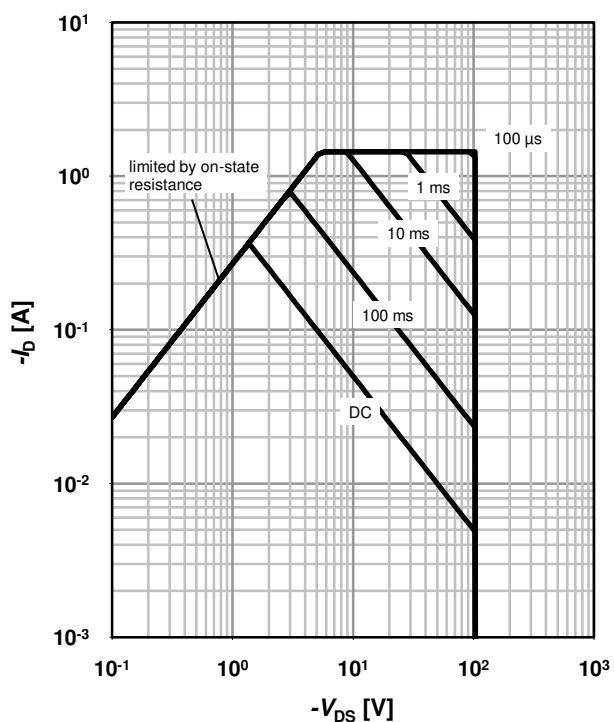
$$I_D=f(T_C); |V_{GS}|\geq 10\text{ V}$$



### 3 Safe operating area

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

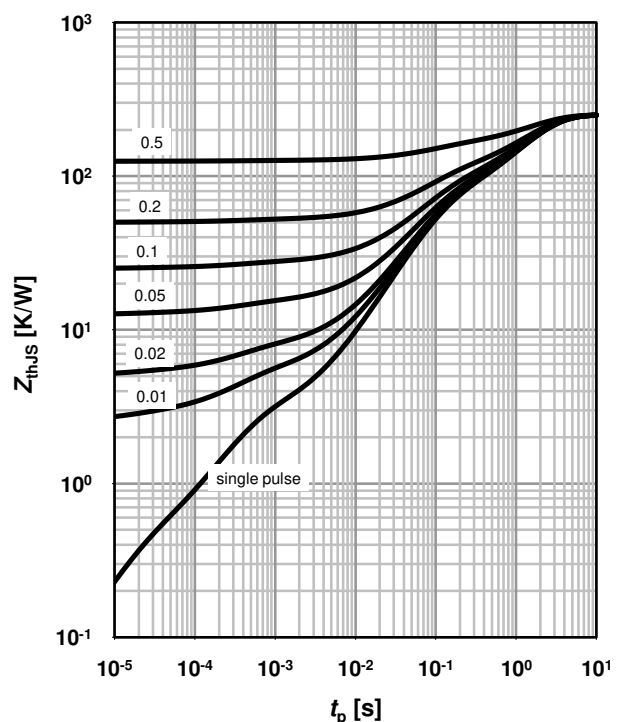
parameter:  $t_p$



### 4 Max. transient thermal impedance

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

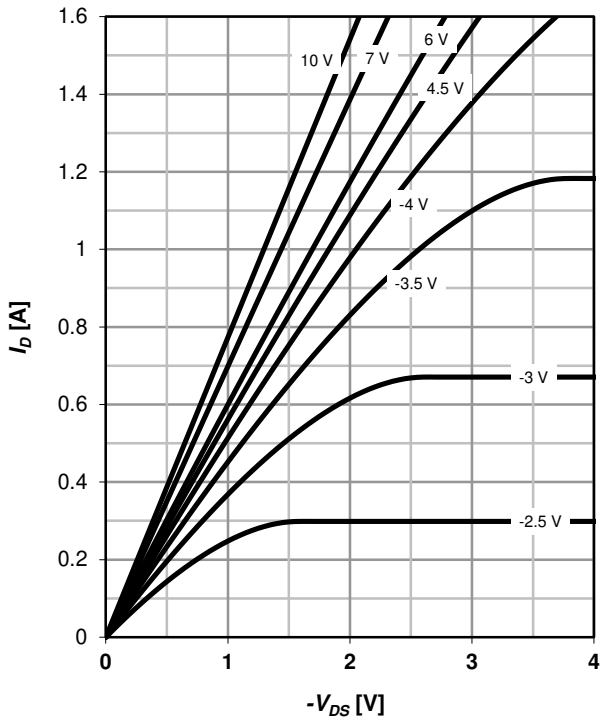
parameter:  $D=t_p/T$



**5 Typ. output characteristics**

$I_D = f(V_{DS}); T_j = 25\text{ °C}$

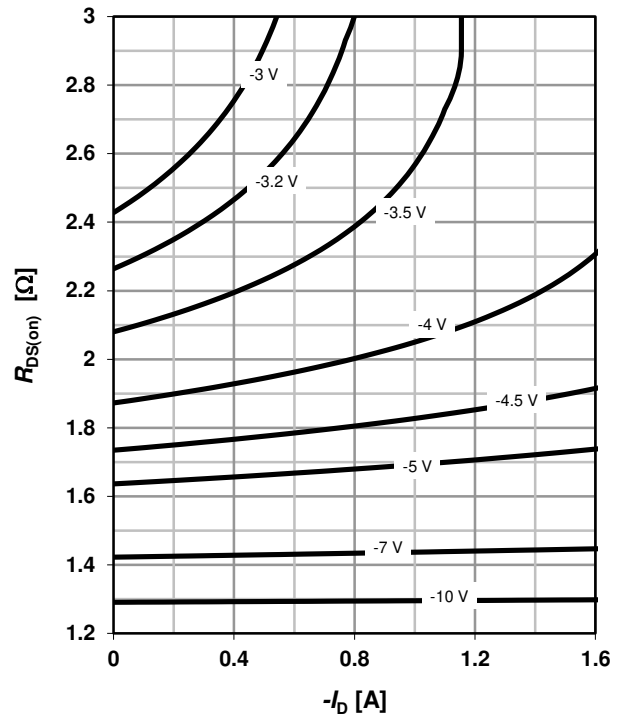
parameter:  $V_{GS}$



**6 Typ. drain-source on resistance**

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

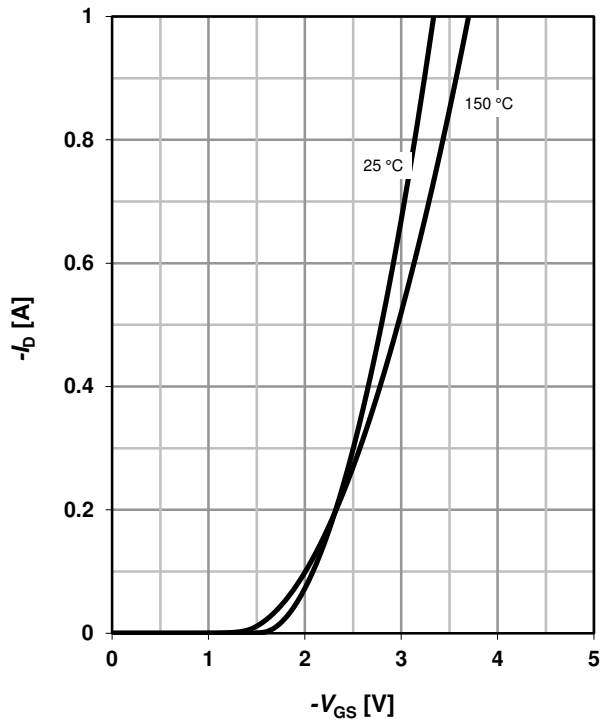
parameter:  $V_{GS}$



**7 Typ. transfer characteristics**

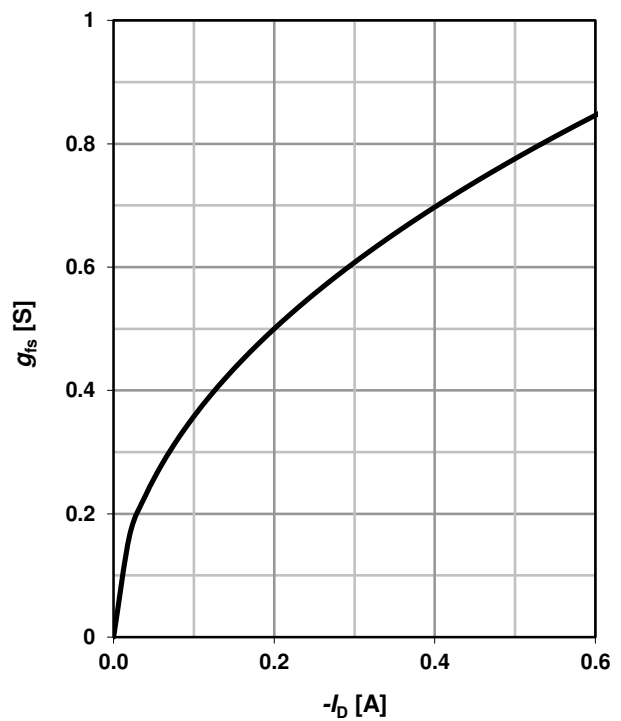
$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$

parameter:  $T_j$



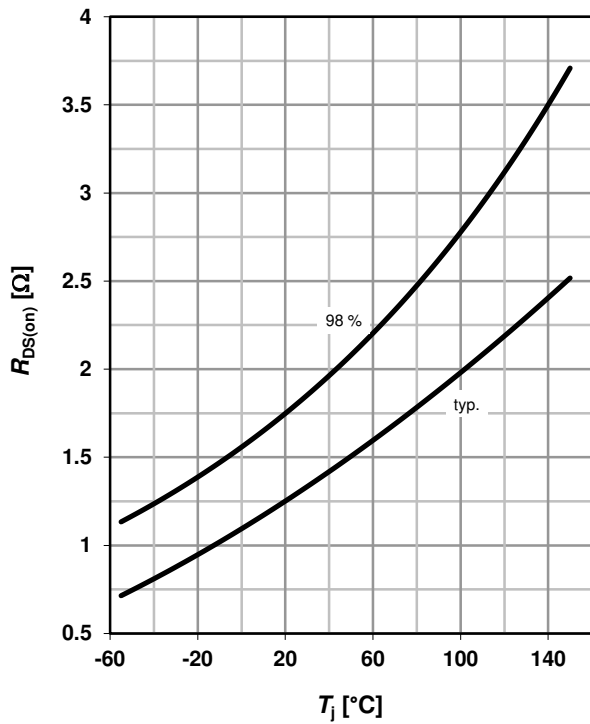
**8 Typ. forward transconductance**

$g_{fs} = f(I_D); T_j = 25\text{ °C}$



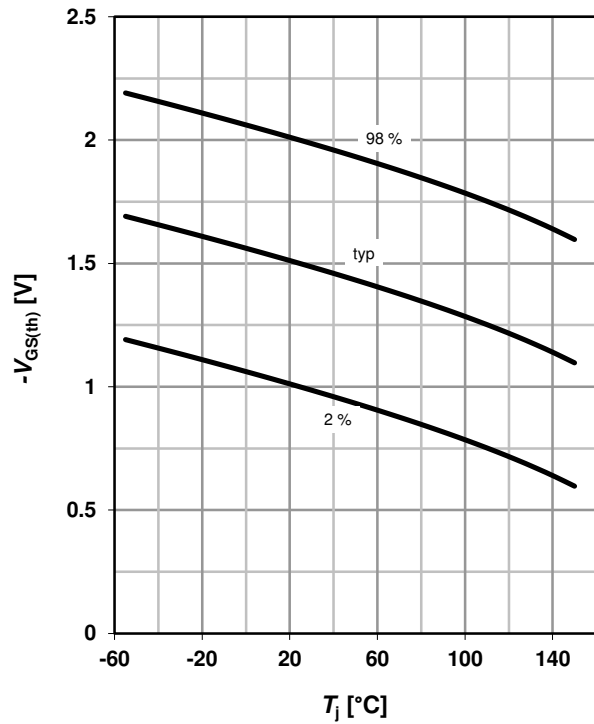
**9 Drain-source on-state resistance**

$R_{DS(on)}=f(T_j); I_D=-0.36\text{ A}; V_{GS}=-10\text{ V}$



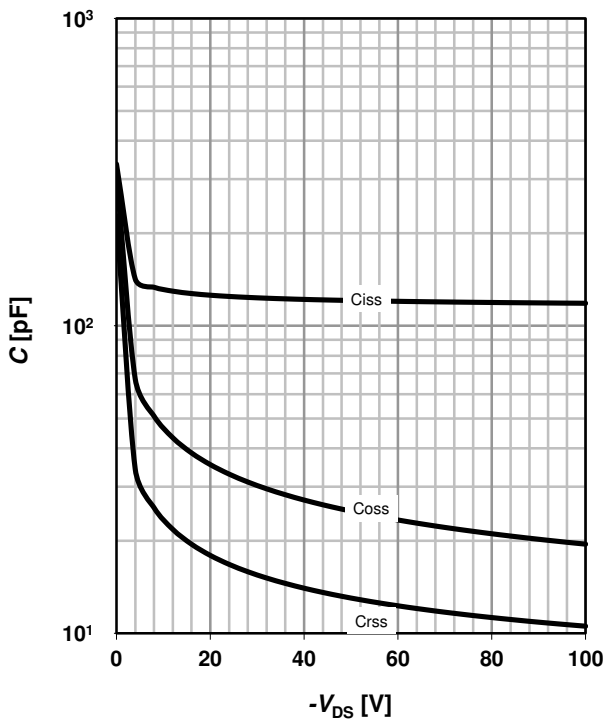
**10 Typ. gate threshold voltage**

$V_{GS(th)}=f(T_j); V_{GS}=V_{DS}; I_D=-170\text{ }\mu\text{A}$



**11 Typ. capacitances**

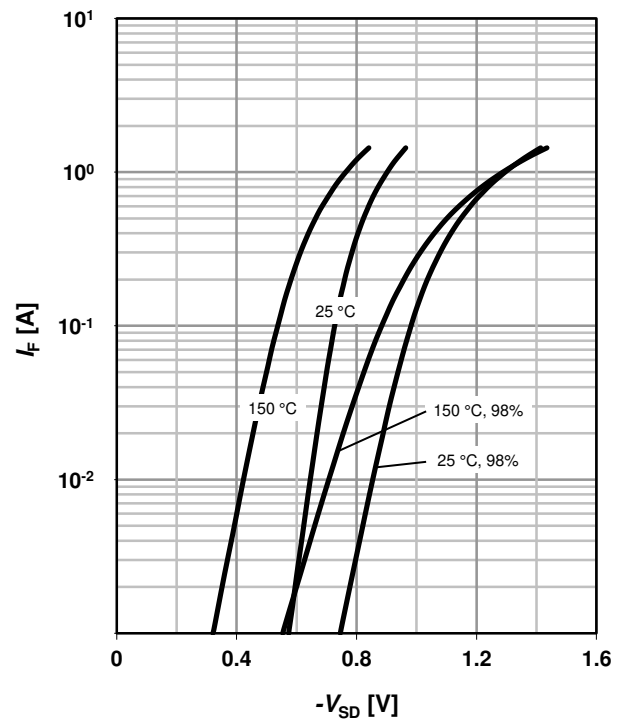
$C=f(V_{DS}); V_{GS}=0\text{ V}; f=1\text{ MHz}$



**12 Forward characteristics of reverse diode**

$I_F=f(V_{SD})$

parameter:  $T_j$



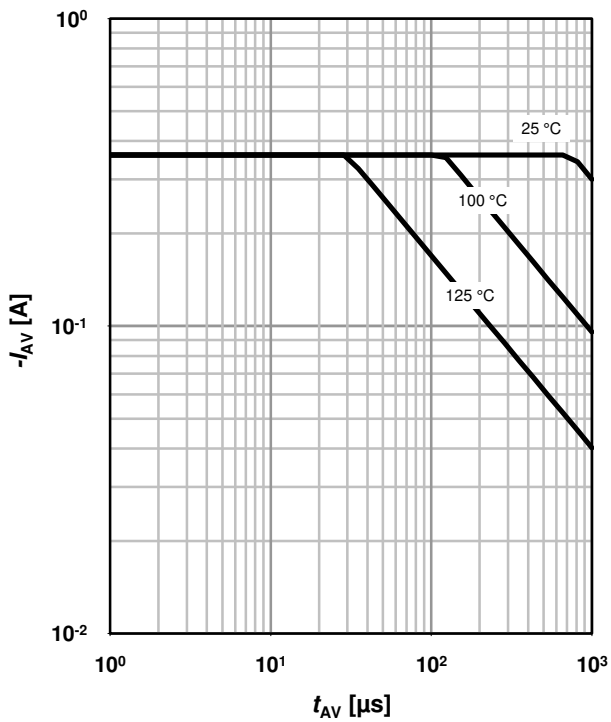




**13 Avalanche characteristics**

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

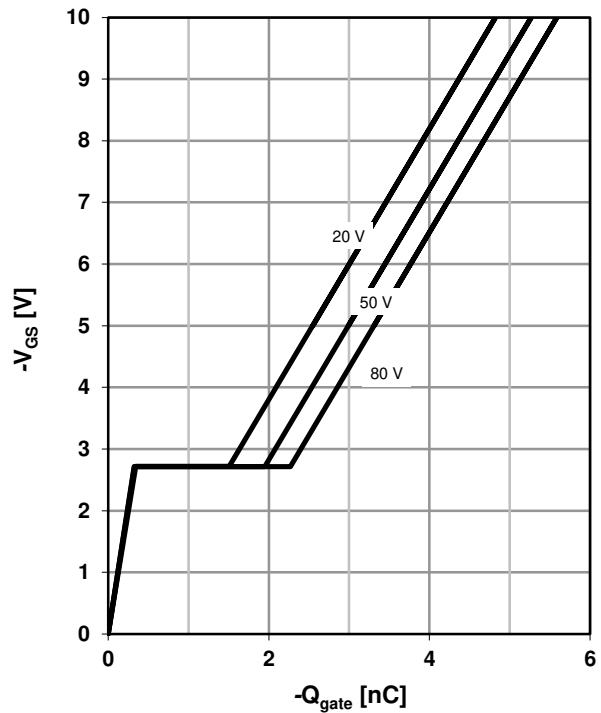
parameter:  $T_{j(start)}$



**14 Typ. gate charge**

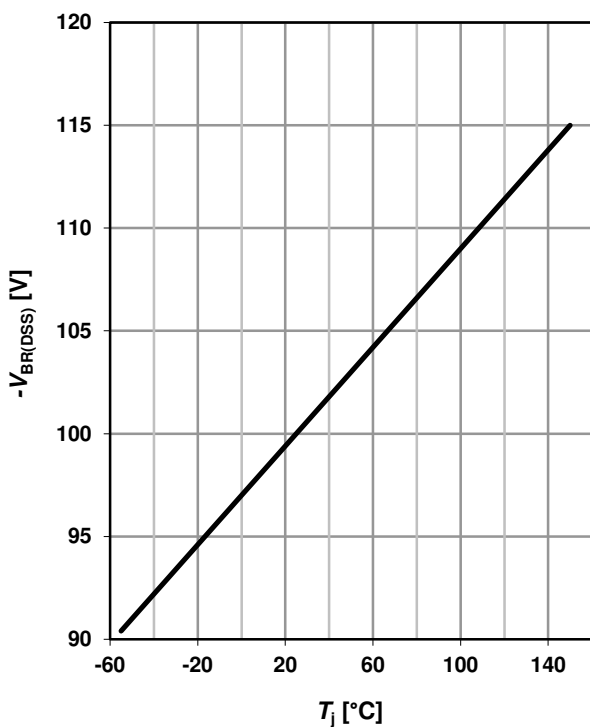
$V_{GS}=f(Q_{gate}); I_D=-0.36 \text{ A pulsed}$

parameter:  $V_{DD}$

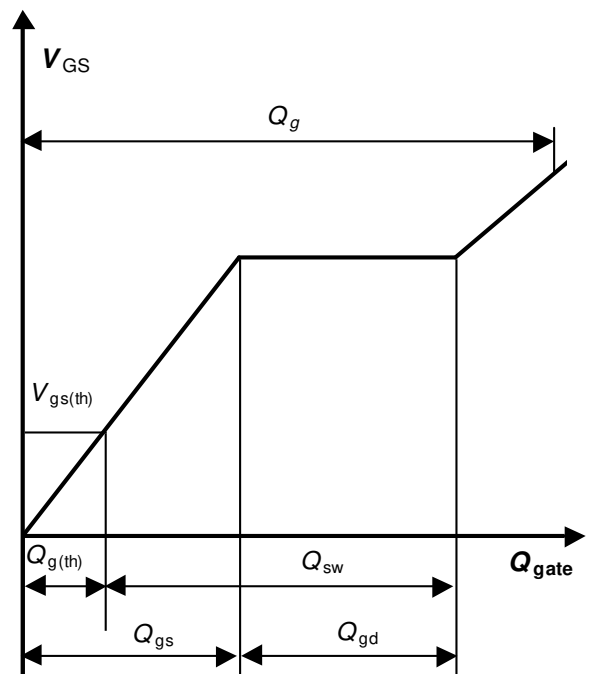


**15 Drain-source breakdown voltage**

$V_{BR(DSS)}=f(T_j); I_D=-250 \mu\text{A}$



**16 Gate charge waveforms**



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