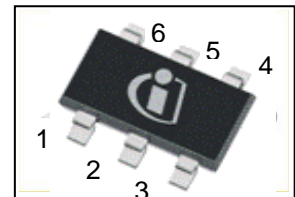
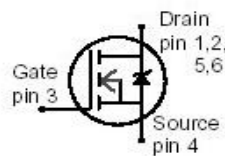


**OptiMOS<sup>®</sup> 2 Small-Signal-Transistor**
**Features**

- N-channel
- Enhancement mode
- Logic level (4.5V rated)
- 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**

$V_{DS}$		30	V
$R_{DS(on),max}$	$V_{GS}=10\text{ V}$	25	$m\Omega$
	$V_{GS}=4.5\text{ V}$	38	
$I_D$		7.1	A

**PG-TSOP-6**


Type	Package	Tape and Reel Information	Marking	Lead Free	Packing
BSL302SN	PG-TSOP-6	H6327 = 3000 pcs. / reel	sPE	Yes	Non dry

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	$I_D$	$T_A=25\text{ °C}$	7.1	A
		$T_A=70\text{ °C}$	5.7	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ °C}$	28	
Avalanche energy, single pulse	$E_{AS}$	$I_D=7.1\text{ A}$ , $R_{GS}=25\ \Omega$	30	mJ
Reverse diode dv/dt	dv/dt	$I_D=7.5\text{ A}$ , $V_{DS}=16\text{ V}$ , $di/dt=200\text{ A}/\mu\text{s}$ , $T_{j,max}=150\text{ °C}$	6	kV/ $\mu\text{s}$
Gate source voltage	$V_{GS}$		$\pm 20$	V
Power dissipation <sup>1)</sup>	$P_{tot}$	$T_A=25\text{ °C}$	2	W
Operating and storage temperature	$T_j$ , $T_{stg}$		-55 ... 150	$^{\circ}\text{C}$
ESD Class		JESD22-A114-HBM	0 (0V to 250V)	
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 - minimal footprint	$R_{thJS}$		-	-	50	K/W
SMD version, device on PCB	$R_{thJA}$	minimal footprint	-	-	230	
		6 cm <sup>2</sup> cooling area <sup>1)</sup>	-	-	62.5	

**Electrical characteristics, at  $T_j=25\text{ °C}$ , unless otherwise specified**
**Static characteristics**

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$	30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=30\text{ }\mu\text{A}$	1.2	1.70	2	
Drain-source leakage current	$I_{DSS}$	$V_{DS}=20\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ °C}$	-	-	1	$\mu\text{A}$
		$V_{DS}=20\text{ V}, V_{GS}=0\text{ V}, T_j=150\text{ °C}$	-	-	100	
Gate-source leakage current	$I_{GSS}$	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=4.5\text{ V}, I_D=5.7\text{ A}$	-	27	38	$\text{m}\Omega$
		$V_{GS}=10\text{ V}, I_D=7.1\text{ A}$	-	18	25	
Transconductance	$g_{fs}$	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=7.1\text{ A}$		16	-	S

<sup>1)</sup> Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm<sup>2</sup> (single layer, 70  $\mu\text{m}$  thick) copper area for drain connection. PCB is vertical in still air. ( $t < 5\text{ sec.}$ )

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Dynamic characteristics**

Input capacitance	$C_{iss}$	$V_{GS}=0\text{ V}, V_{DS}=15\text{ V},$ $f=1\text{ MHz}$	-	564	750	pF
Output capacitance	$C_{oss}$		-	202	269	
Reverse transfer capacitance	$C_{rss}$		-	28	43	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=15\text{ V}, V_{GS}=10\text{ V},$ $I_D=7.1\text{ A}, R_{G,ext}=1.6\ \Omega$	-	6.4	-	ns
Rise time	$t_r$		-	2.8	-	
Turn-off delay time	$t_{d(off)}$		-	13.7	-	
Fall time	$t_f$		-	1.9	-	

**Gate Charge Characteristics**

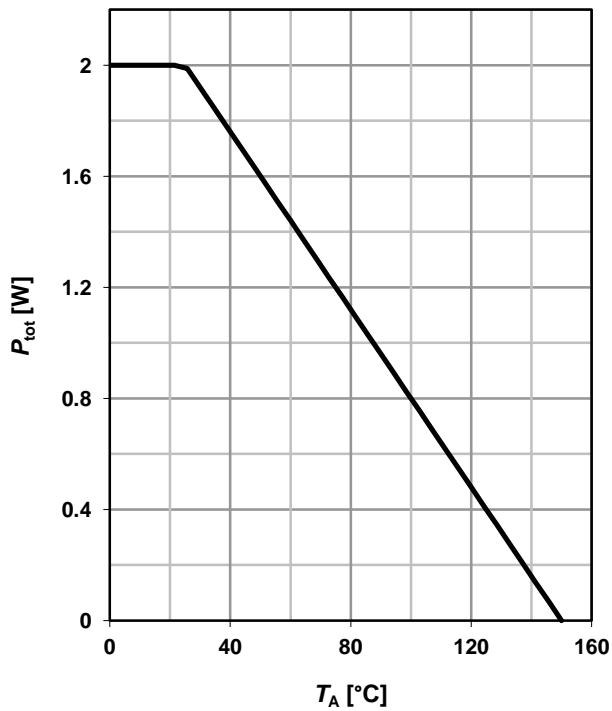
Gate to source charge	$Q_{gs}$	$V_{DD}=15\text{ V}, I_D=7.1\text{ A},$ $V_{GS}=0\text{ to }5\text{ V}$	-	1.78	2.37	nC
Gate to drain charge	$Q_{gd}$		-	1.2	1.8	
Gate charge total	$Q_g$		-	4.4	6.6	
Gate plateau voltage	$V_{plateau}$		-	3.2	-	V

**Reverse Diode**

Diode continuous forward current	$I_S$	$T_A=25\text{ }^\circ\text{C}$	-	-	2.5	A
Diode pulse current	$I_{S,pulse}$		-	-	28	
Diode forward voltage	$V_{SD}$	$V_{GS}=0\text{ V}, I_F=7.1\text{ A},$ $T_j=25\text{ }^\circ\text{C}$	-	0.8	1.2	V
Reverse recovery time	$t_{rr}$	$V_R=15\text{ V}, I_F=7.1\text{ A},$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	14.2	-	ns
Reverse recovery charge	$Q_{rr}$		-	5.1	-	nC

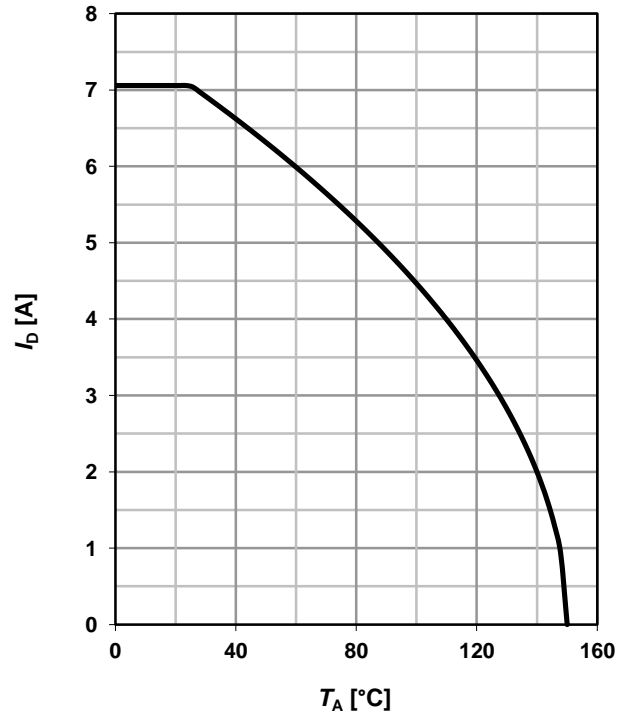
**1 Power dissipation**

$P_{tot}=f(T_A)$



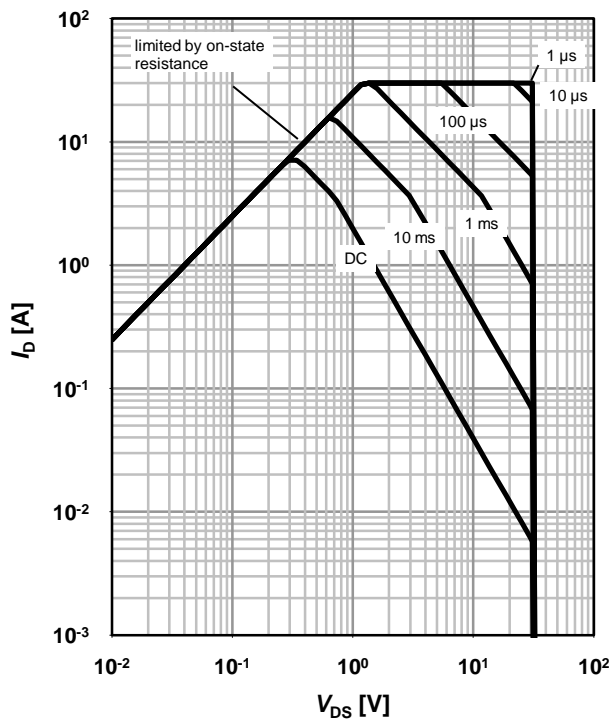
**2 Drain current**

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



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

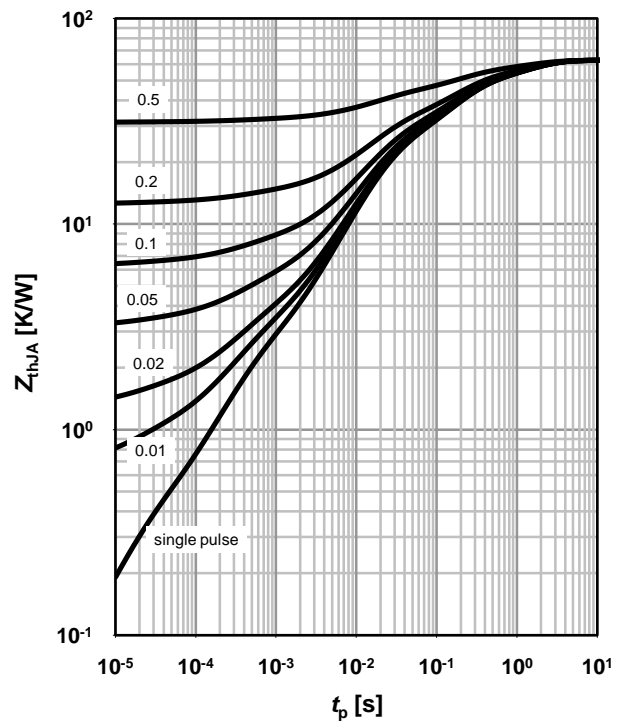
parameter:  $t_p$



**4 Max. transient thermal impedance**

$Z_{thJA}=f(t_p)$

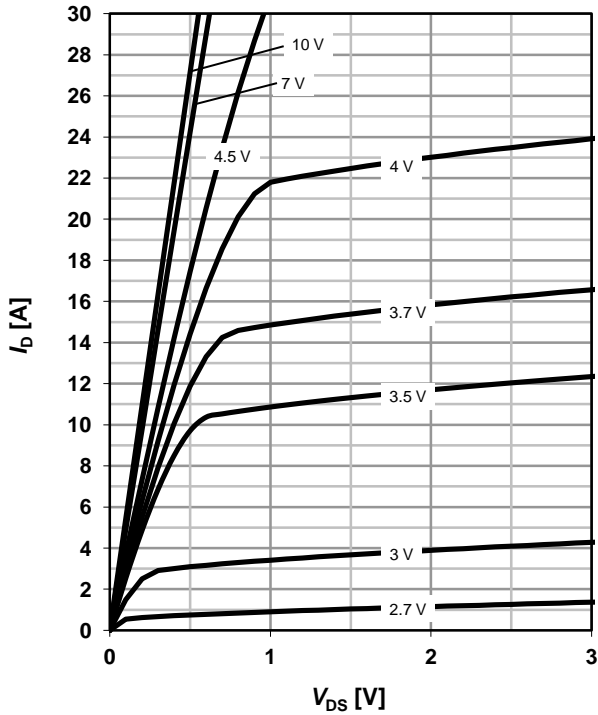
parameter:  $D=t_p/T$



**5 Typ. output characteristics**

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

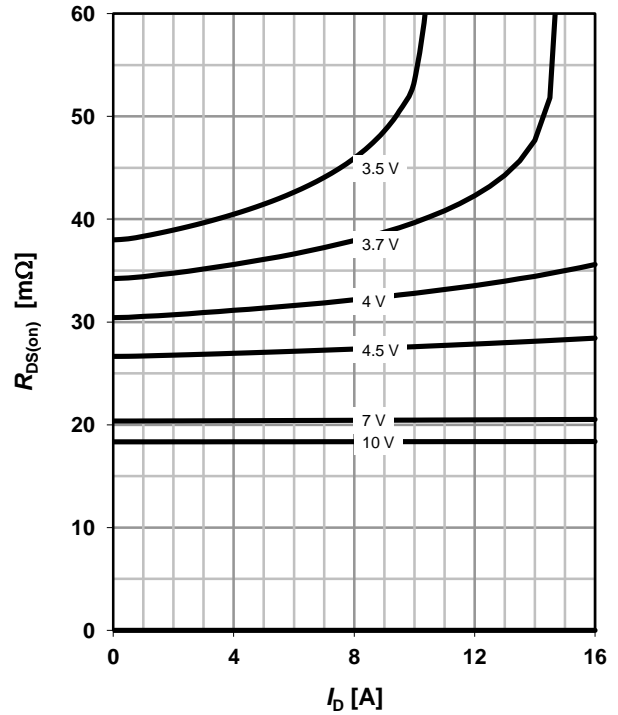
parameter:  $V_{GS}$



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

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

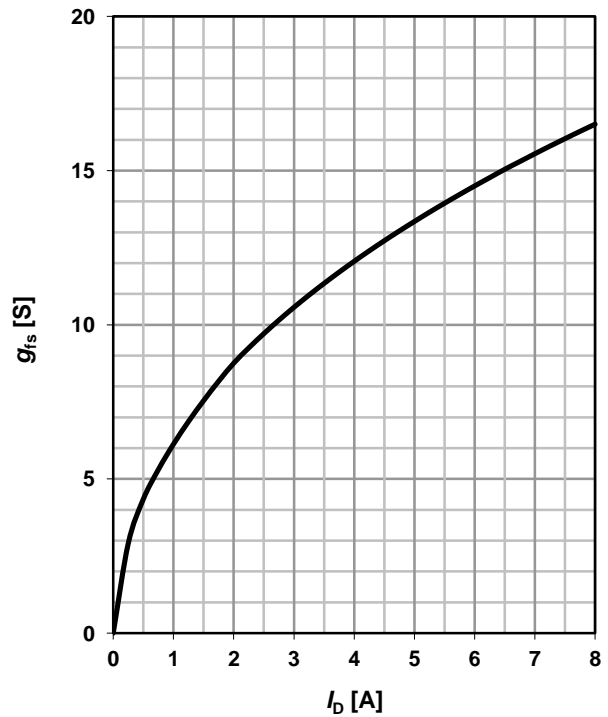
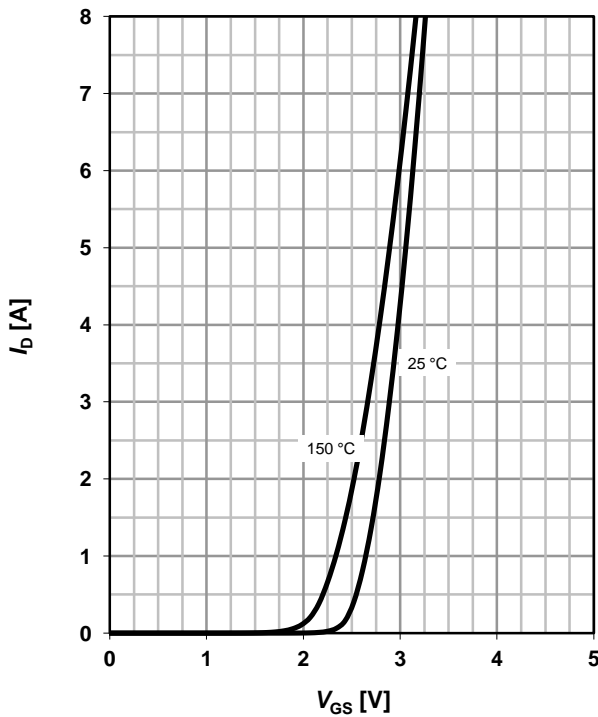
parameter:  $V_{GS}$



**8 Typ. forward transconductance**

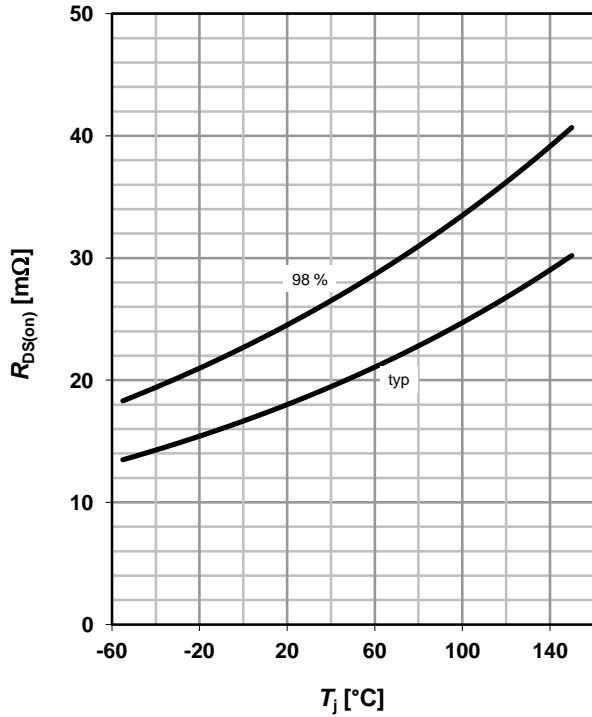
$I_D=f(V_{GS}); |V_{DS}|>2|I_D|R_{DS(on)max}$

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



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

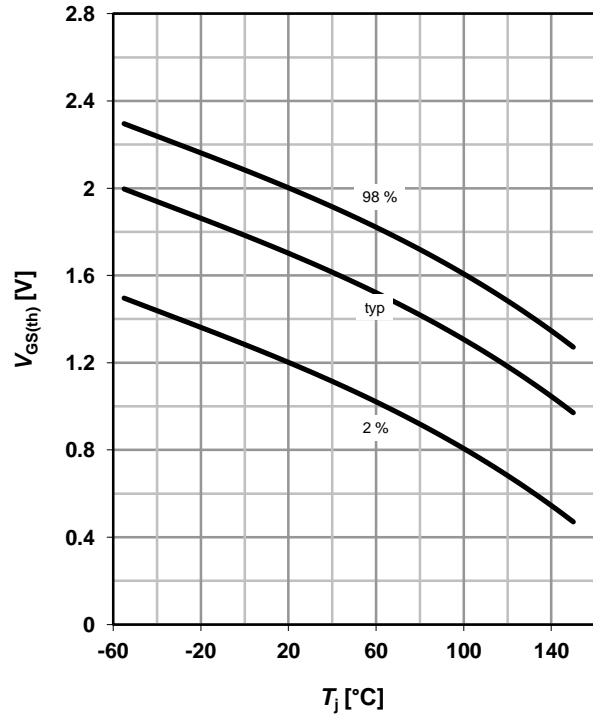
$R_{DS(on)}=f(T_j); I_D=7.1\text{ A}; V_{GS}=10\text{ V}$



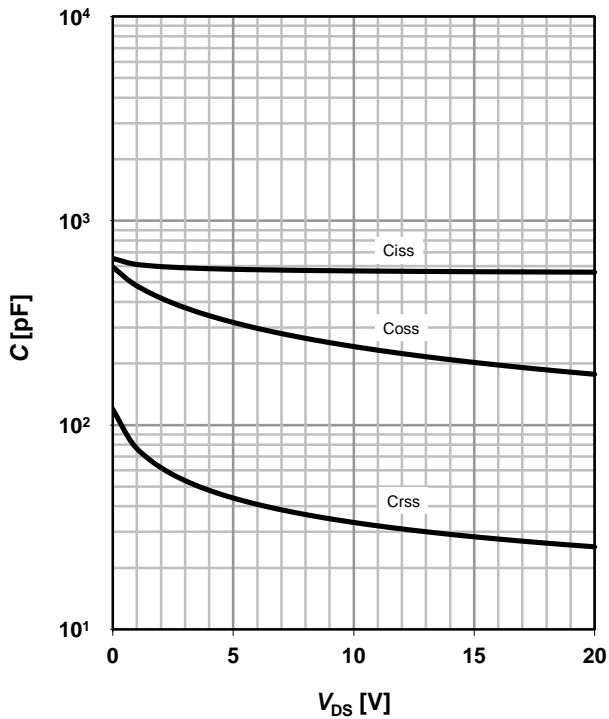
**10 Typ. gate threshold voltage**

$V_{GS(th)}=f(T_j); V_{DS}=V_{GS}; I_D=30\ \mu\text{A}$

parameter:  $I_D$



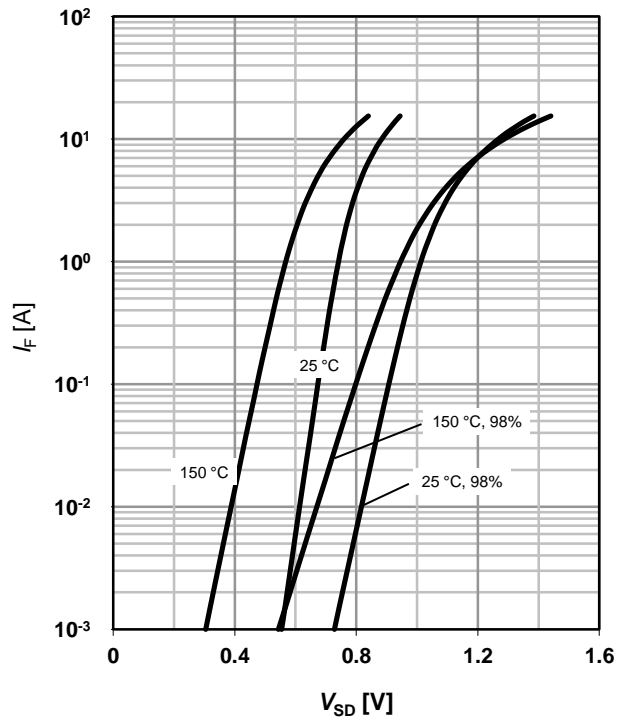
$C=f(V_{DS}); V_{GS}=0\text{ V}; f=1\text{ MHz}; T_j=25^\circ\text{C}$



**12 Forward characteristics of reverse diode**

$I_F=f(V_{SD})$

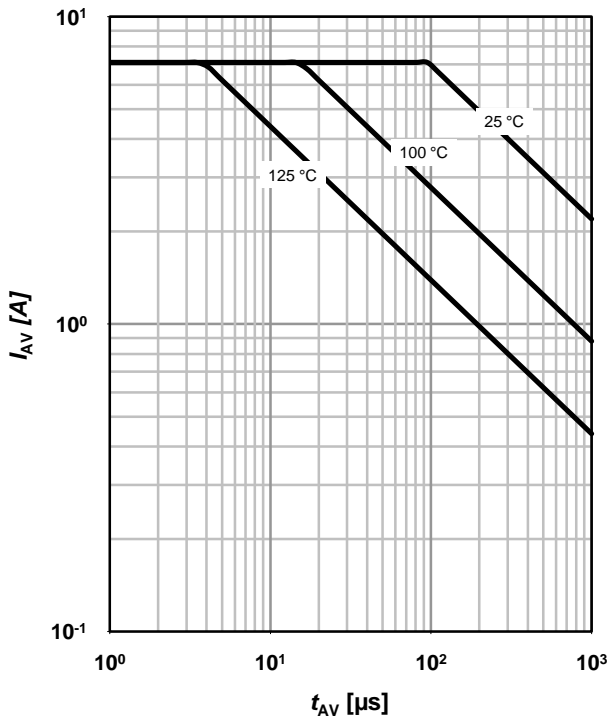
parameter:  $T_j$



**13 Avalanche characteristics**

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

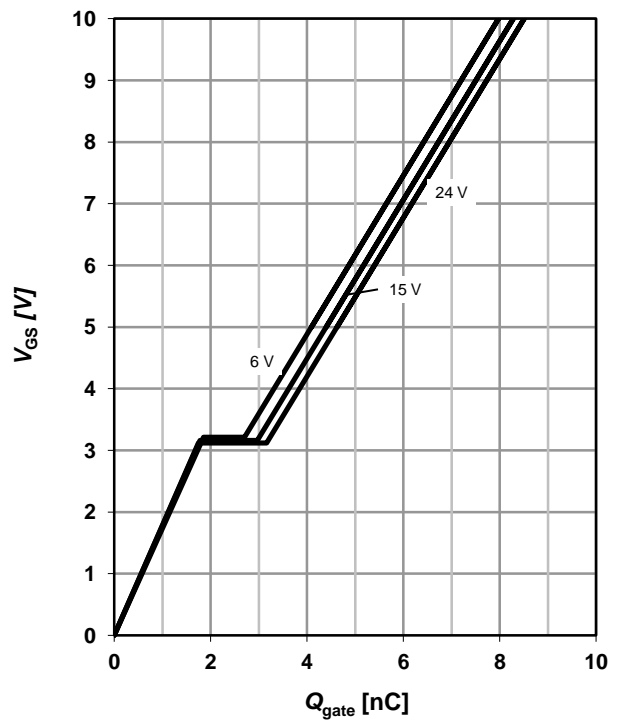
parameter:  $T_{j(\text{start})}$



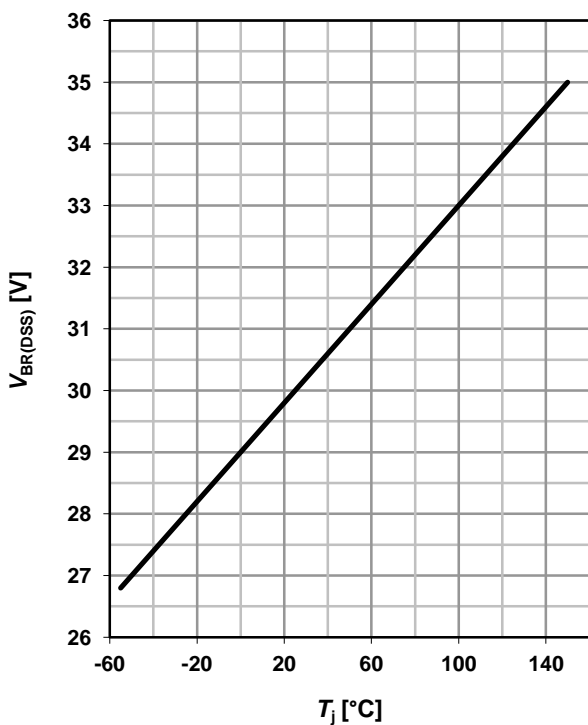
**14 Typ. gate charge**

$V_{GS}=f(Q_{\text{gate}}); I_D=7.1 \text{ A pulsed}$

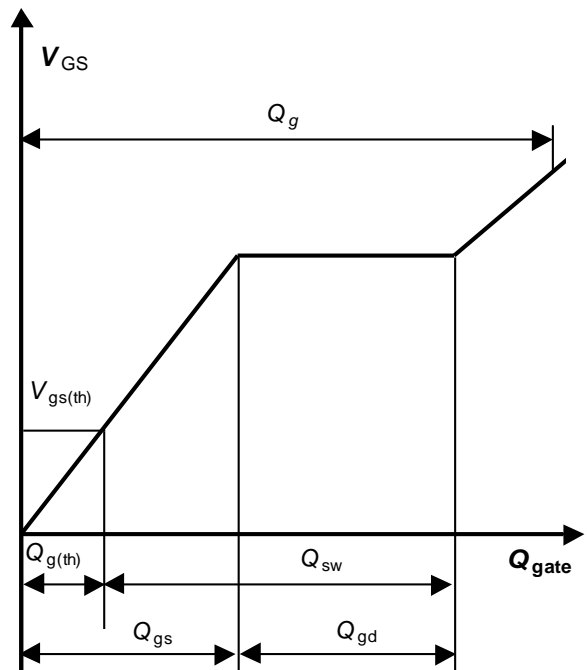
parameter:  $V_{DD}$



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



**16 Gate charge waveforms**



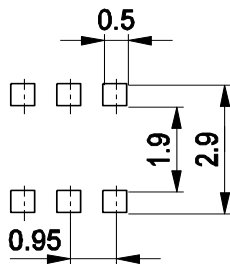
Package Outline:

TSOP6



GPX09300

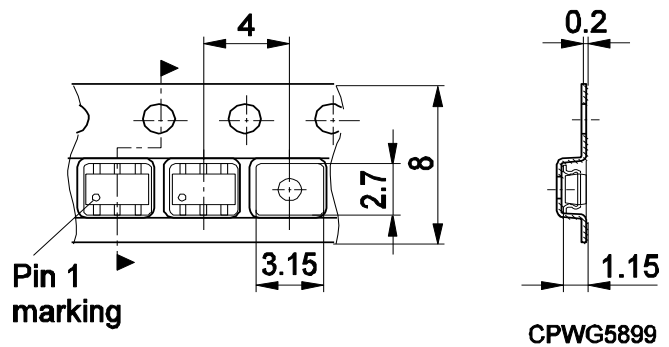
Footprint:



Remark: Wave soldering possible dep. on customers process conditions

HLG09283

Packaging:



Pin 1 marking

CPWG5899

Dimensions in mm



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