

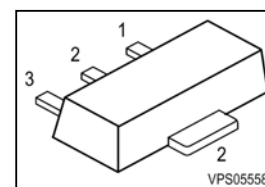
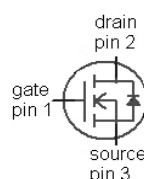


**SIPMOS® Small-Signal-Transistor**
**Feature**

- n-channel
- enhancement mode
- Logic level
- $dv/dt$  rated
- Qualified according to AEC Q101


**Product Summary**

$V_{DS}^{1)}$	600	V
$R_{DS(on),max}$	45	$\Omega$
$I_D$	0.09	A

**SOT89**


Type	Package	Pb-free	Tape and Reel Information	Marking
BSS225	SOT89	Yes	L6327: 3000PCS/reel	KD

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

Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	$I_D$	$T_A=25\text{ }^\circ\text{C}$	0.09	A
		$T_A=70\text{ }^\circ\text{C}$	0.073	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ }^\circ\text{C}$	0.36	
Reverse diode $dv/dt$	$dv/dt$	$I_D=0.09\text{ A}$ , $V_{DS}=480\text{ V}$ , $di/dt=200\text{ A}/\mu\text{s}$ , $T_{j,max}=150\text{ }^\circ\text{C}$	6	kV/ $\mu\text{s}$
Gate source voltage	$V_{GS}$		$\pm 20$	V
ESD Class JESD22-A114-HBM			Class 1a	
Power dissipation	$P_{tot}$	$T_A=25\text{ }^\circ\text{C}$	1.00	W
Operating and storage temperature	$T_j, T_{stg}$		-55 ... 150	$^\circ\text{C}$
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	$R_{thJA}$		-	-	125	K/W
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**Electrical characteristics, at  $T_j=25\text{ °C}$ , unless otherwise specified**
**Static characteristics**

Drain-source breakdown voltage <sup>1)</sup>	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$	600	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=0\text{ V}, I_D=94\text{ }\mu\text{A}$	1.3	1.9	2.3	
Drain-source leakage current	$I_{D(off)}$	$V_{DS}=600\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ °C}$	-	-	0.1	$\mu\text{A}$
		$V_{DS}=600\text{ V}, V_{GS}=0\text{ V}, T_j=150\text{ °C}$	-	-	5	
Gate-source leakage current	$I_{GSS}$	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$	-	10	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=4.5\text{ V}, I_D=0.09\text{ A}$	-	30	45	$\Omega$
		$V_{GS}=10\text{ V}, I_D=0.09\text{ A}$	-	28	45	
Transconductance	$g_{fs}$	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=0.075\text{ A}$	0.05	0.14	-	S

<sup>1)</sup>  $V_{DS}$  is zero-hour rated, see note at p.8

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Dynamic characteristics**

Input capacitance	$C_{iss}$	$V_{GS}=0\text{ V}, V_{DS}=25\text{ V},$ $f=1\text{ MHz}$	-	99	131	pF
Output capacitance	$C_{oss}$		-	7.6	11	
Reverse transfer capacitance	$C_{rss}$		-	3.1	4.4	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=300\text{ V},$ $V_{GS}=10\text{ V}, I_D=0.09\text{ A},$ $R_G=6\ \Omega$	-	14.0	20.0	ns
Rise time	$t_r$		-	38.0	57.0	
Turn-off delay time	$t_{d(off)}$		-	62.0	93	
Fall time	$t_f$		-	41.0	62	

**Gate Charge Characteristics**

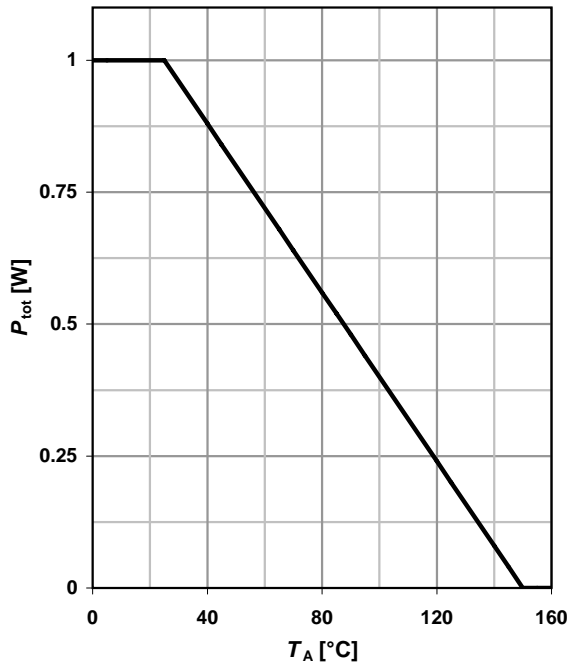
Gate to source charge	$Q_{gs}$	$V_{DD}=400\text{ V},$ $I_D=0.09\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	0.32	0.43	nC
Gate to drain charge	$Q_{gd}$		-	1.4	2.1	
Gate charge total	$Q_g$		-	3.9	5.8	
Gate plateau voltage	$V_{plateau}$		-	3.3	-	V

**Reverse Diode**

Diode continuous forward current	$I_S$	$T_A=25\text{ }^\circ\text{C}$	-	-	0.09	A
Diode pulse current	$I_{S,pulse}$		-	-	0.36	
Diode forward voltage	$V_{SD}$	$V_{GS}=0\text{ V}, I_F=0.09\text{ A},$ $T_j=25\text{ }^\circ\text{C}$	-	0.75	1.2	V
Reverse recovery time	$t_{rr}$	$V_R=300\text{ V}, I_F=0.09\text{ A},$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	246	370	ns
Reverse recovery charge	$Q_{rr}$		-	248	373	

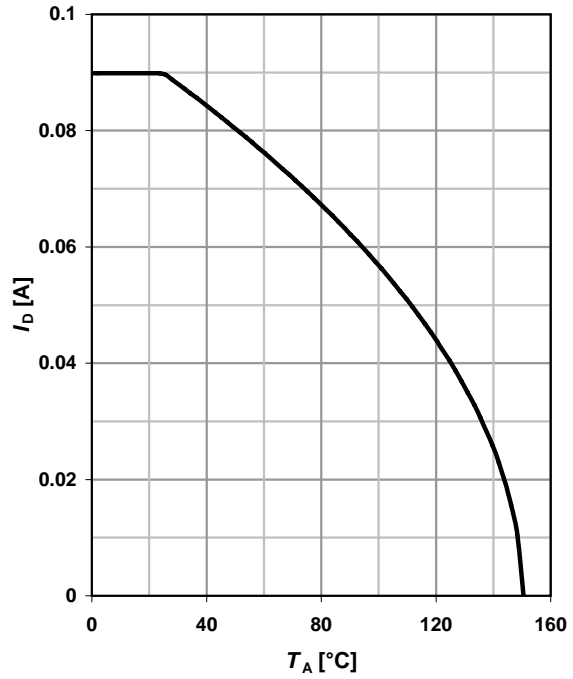
**1 Power dissipation**

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



**2 Drain current**

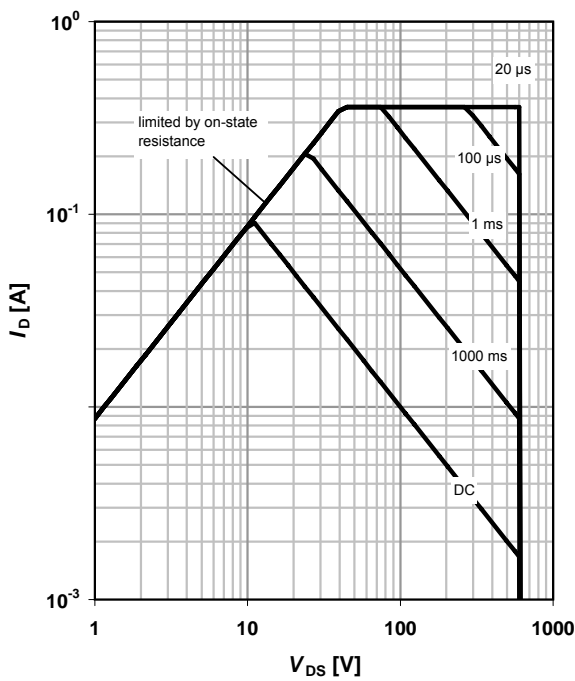
$$I_D = f(T_A); V_{GS} \geq 10 \text{ V}$$



**3 Safe operating area**

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

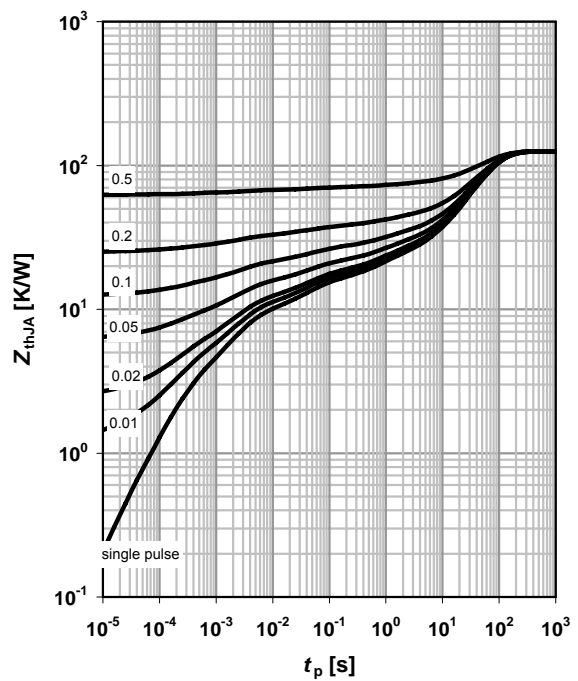
parameter:  $t_p$



**4 Max. transient thermal impedance**

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

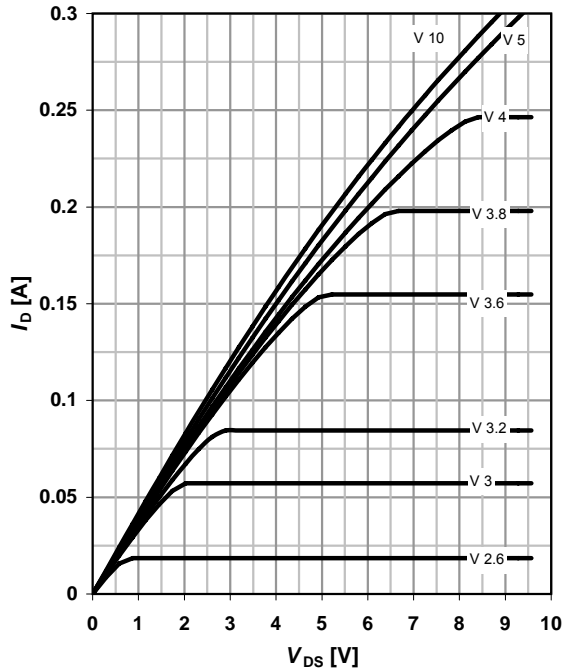
parameter:  $D = t_p / T$



**5 Typ. output characteristics**

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

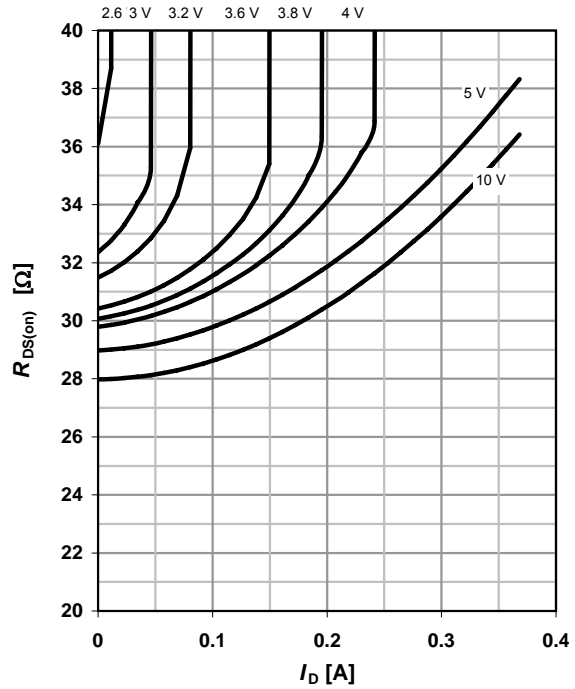
parameter:  $V_{GS}$



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

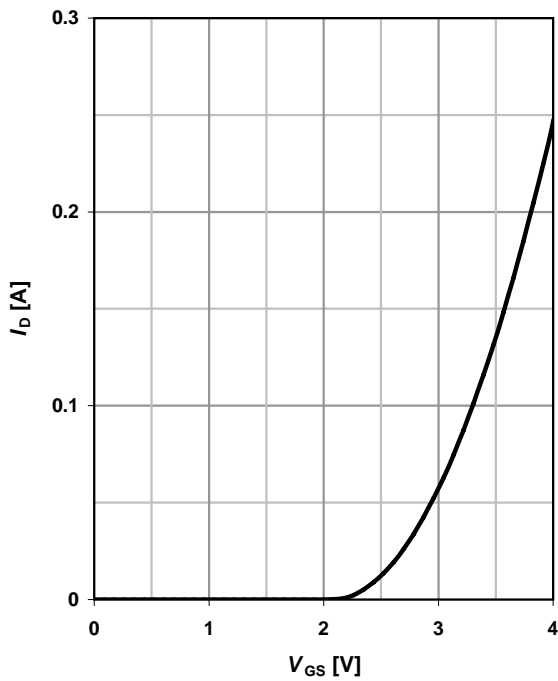
$R_{DS(on)} = f(I_D); T_j = 25\text{ }^\circ\text{C}$

parameter:  $V_{GS}$



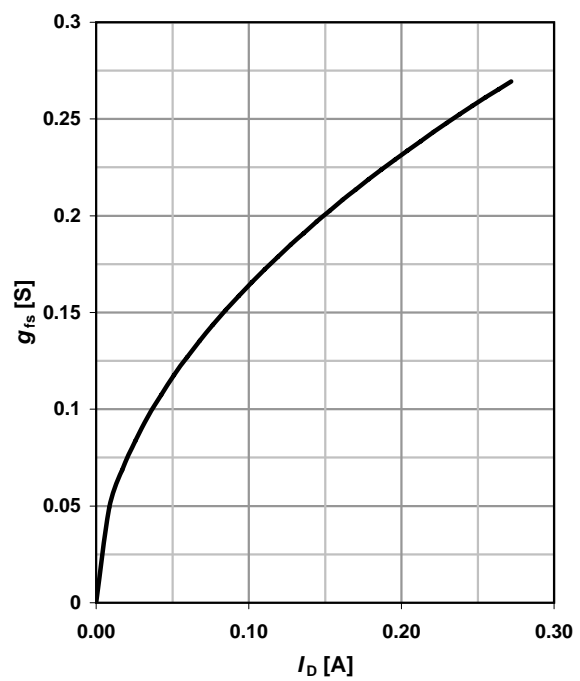
**7 Typ. transfer characteristics**

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



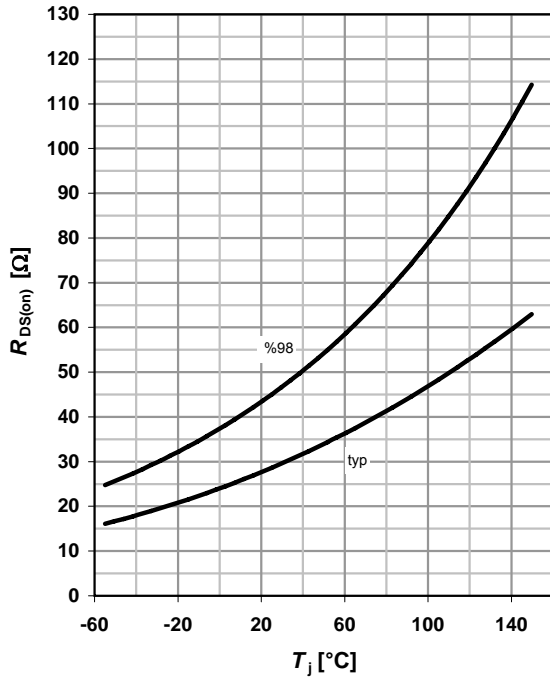
**8 Typ. forward transconductance**

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



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

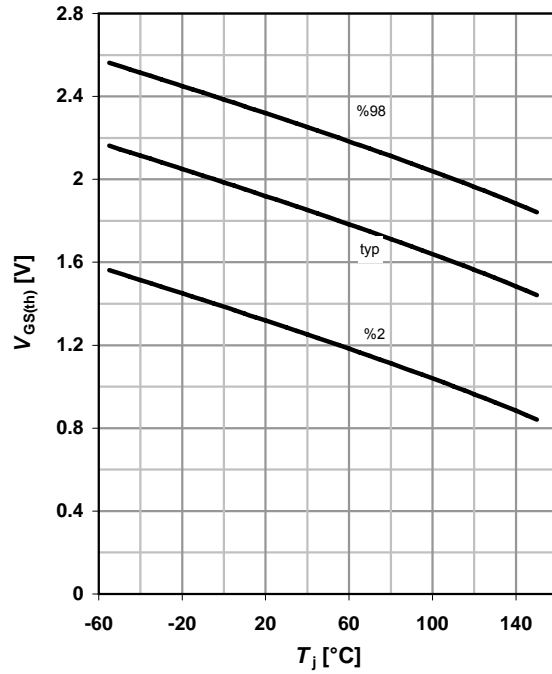
$R_{DS(on)} = f(T_j); I_D = 0.1 \text{ A}; V_{GS} = 10 \text{ V}$



**10 Typ. gate threshold voltage**

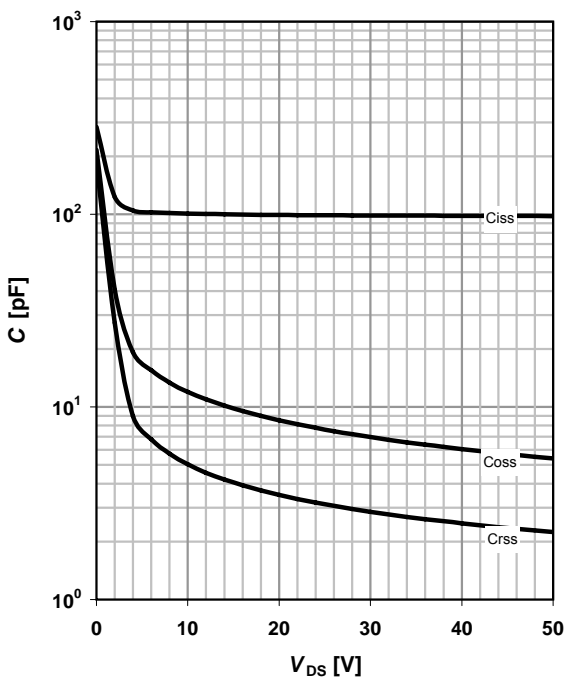
$V_{GS(th)} = f(T_j); V_{DS} = V_{GS}; I_D = 94 \mu\text{A}$

parameter:  $I_D$



**11 Typ. capacitances**

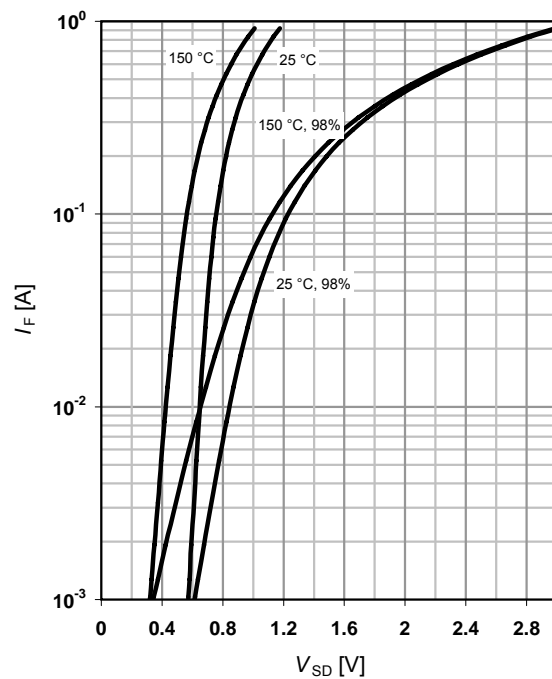
$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}; T_j = 25^\circ\text{C}$



**12 Forward characteristics of reverse diode**

$I_F = f(V_{SD})$

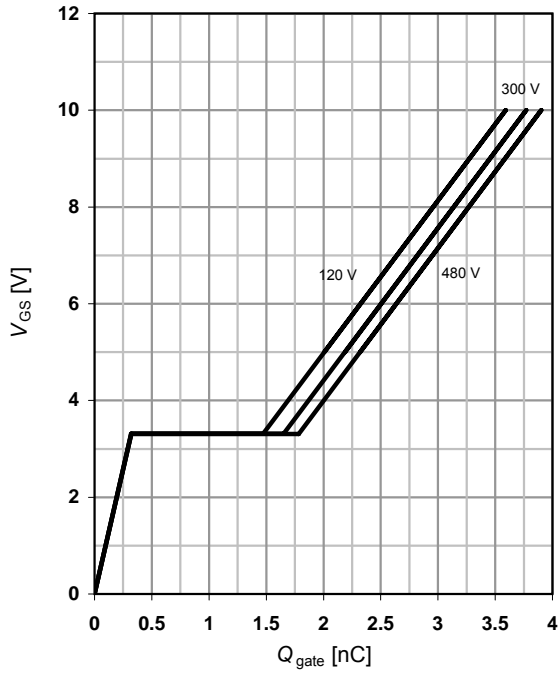
parameter:  $T_j$



**13 Typ. gate charge**

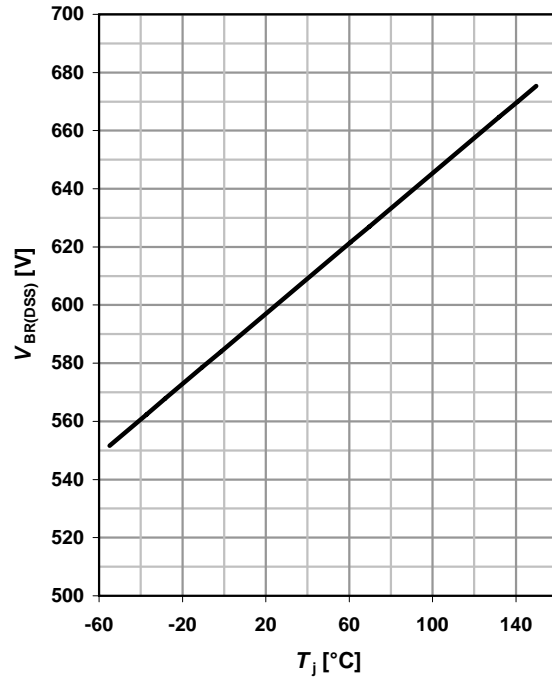
$$V_{GS} = f(Q_{gate}); I_D = 0.1 \text{ A pulsed}$$

parameter:  $V_{DD}$



**14 Drain-source breakdown voltage**

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





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