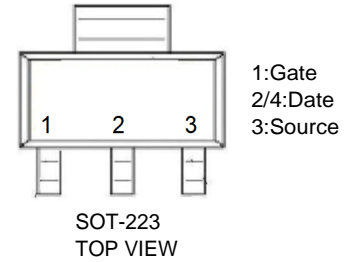


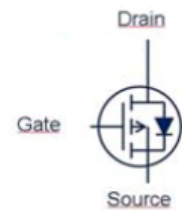
### Features

- Enhancement mode
- Avalanche rated
- dv /dt rated
- Pb-free lead plating; RoHS compliant



### Product Summary

- $V_{DS}$  (V) = -60V
- $I_D = -1.9A$  ( $V_{GS} = -10V$ )
- $R_{DS(ON)} < 300m\Omega$  ( $V_{GS} = -10V$ )



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

Parameter	Symbol	Conditions	Value	Unit
			steady state	
Continuous drain current	$I_D$	$T_A=25\text{ }^\circ\text{C}$	-1.9	A
		$T_A=70\text{ }^\circ\text{C}$	-1.5	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\text{ }^\circ\text{C}$	-7.6	
Avalanche energy, single pulse	$E_{AS}$	$I_D=1.9\text{ A}$ , $R_{GS}=25\text{ }\Omega$	70	mJ
Avalanche energy, periodic limited by $T_{jmax}$	$E_{AR}$		0.18	
Reverse diode dv /dt	dv /dt	$I_D=1.9\text{ A}$ , $V_{DS}=48\text{ V}$ , $di /dt = -200\text{ A}/\mu\text{s}$ , $T_{j,max}=150\text{ }^\circ\text{C}$	-6	kV/ $\mu\text{s}$
Gate source voltage	$V_{GS}$		$\pm 20$	V
Power dissipation	$P_{tot}$	$T_A=25\text{ }^\circ\text{C}$	1.8	W
Operating and storage temperature	$T_j, T_{stg}$		-55 ... 150	
$^\circ\text{C}$			1A (250V to 500V)	
ESD class		JESD22-C101 (HBM)	260 $^\circ\text{C}$	
Soldering temperature			55/150/56	

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Thermal characteristics**

Thermal resistance, junction -soldering point	$R_{thJS}$				20	K/W
SMD version, device on PCB:	$R_{thJA}$	minimal footprint			110	K/W
		6 cm <sup>2</sup> cooling area <sup>1)</sup>			70	

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

Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{ V}, I_D=-250\text{ }\mu\text{A}$	-60			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\text{ }\mu\text{A}$	-1.1	-2	-3	
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-60\text{ V}, V_{GS}=0\text{ V}, T_j=25\text{ }^\circ\text{C}$		-0.1	-1	$\mu\text{A}$
		$V_{DS}=-60\text{ V}, V_{GS}=0\text{ V}, T_j=125\text{ }^\circ\text{C}$		-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	$R_{DS(on)}$	$V_{GS}=-10\text{ V}, I_D=-1.9\text{ A}$		239	300	m $\Omega$
Transconductance	$g_{fs}$	$ V_{DS} >2 I_D R_{DS(on)max}, I_D=-1.9\text{ A}$	1.3	2.6		S

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

**Dynamic characteristics**

Input capacitance	$C_{iss}$	$V_{GS}=0\text{ V}, V_{DS}=-25\text{ V},$ $f=1\text{ MHz}$		328	410	pF
Output capacitance	$C_{oss}$			105	135	
Reverse transfer capacitance	$C_{rss}$			38	48	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=-30\text{ V}, V_{GS}=-$ $10\text{ V}, I_D=-1.9\text{ A},$ $R_G=6\ \Omega$		14	21	ns
Rise time	$t_r$			28	42	
Turn-off delay time	$t_{d(off)}$			92	138	
Fall time	$t_f$			60	90	

**Gate Charge Characteristics**

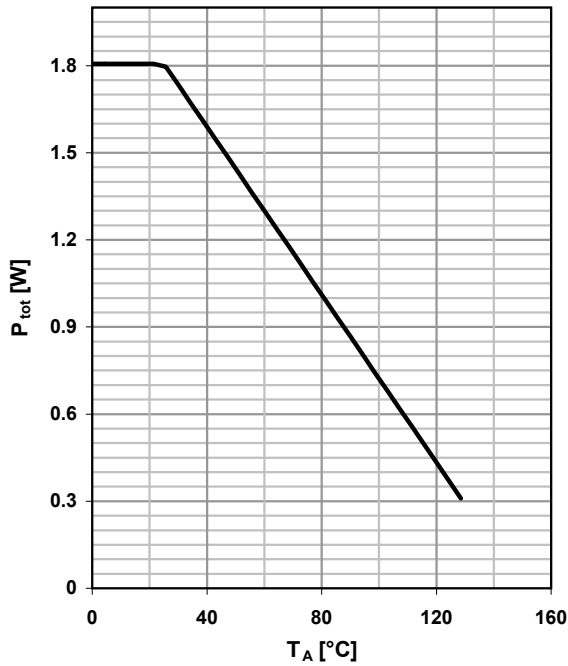
Gate to source charge	$Q_{gs}$	$V_{DD}=-48\text{ V}, I_D=-1.9\text{ A},$ $V_{GS}=0\text{ to }-10\text{ V}$		-1.4	-1.9	nC
Gate to drain charge	$Q_{gd}$			-4.9	-7.4	
Gate charge total	$Q_g$			-10	-14	
Gate plateau voltage	$V_{plateau}$			-4.34	-	V

**Reverse Diode**

Diode continuous forward current	$I_S$	$T_A=25\text{ }^\circ\text{C}$			-1.98	A
Diode pulse current	$I_{S,pulse}$				-7.6	
Diode forward voltage	$V_{SD}$	$V_{GS}=0\text{ V}, I_F=-1.9\text{ A},$ $T_j=25\text{ }^\circ\text{C}$		-0.83	-1.1	V
Reverse recovery time	$t_{rr}$	$V_R=30\text{ V}, I_F= I_S ,$ $di_F/dt=100\text{ A}/\mu\text{s}$		36	54	ns
Reverse recovery charge	$Q_{rr}$			41	62	

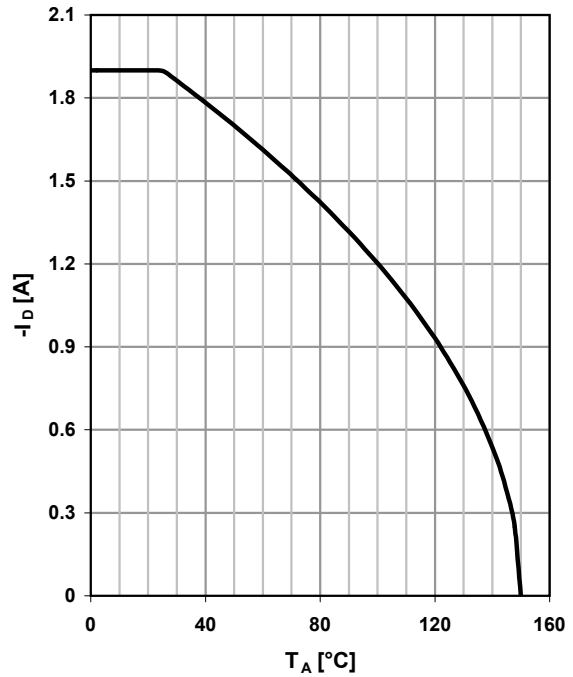
**1 Power dissipation**

$P_{tot}=f(T_A)$



**2 Drain current**

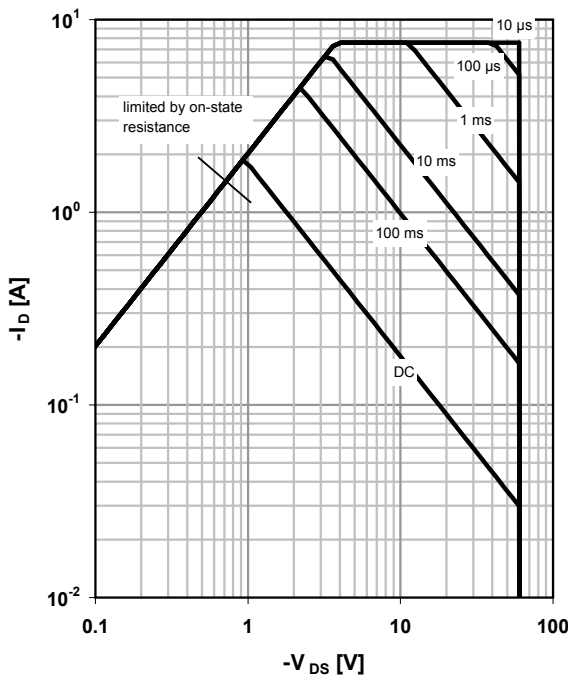
$I_D=f(T_A); |V_{GS}| \geq 10\text{ V}$



**3 Safe operating area**

$I_D=f(V_{DS}); T_A=25\text{ }^\circ\text{C}^1); D=0$

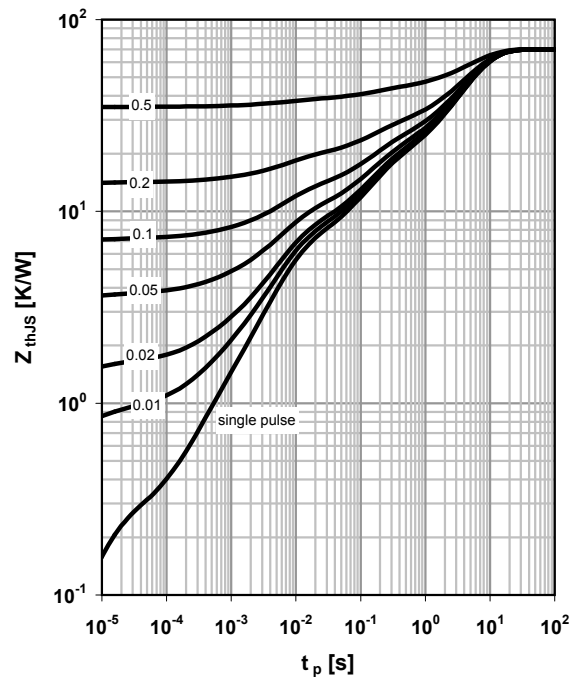
parameter:  $t_p$



**4 Max. transient thermal impedance**

$Z_{thJA}=f(t_p)$

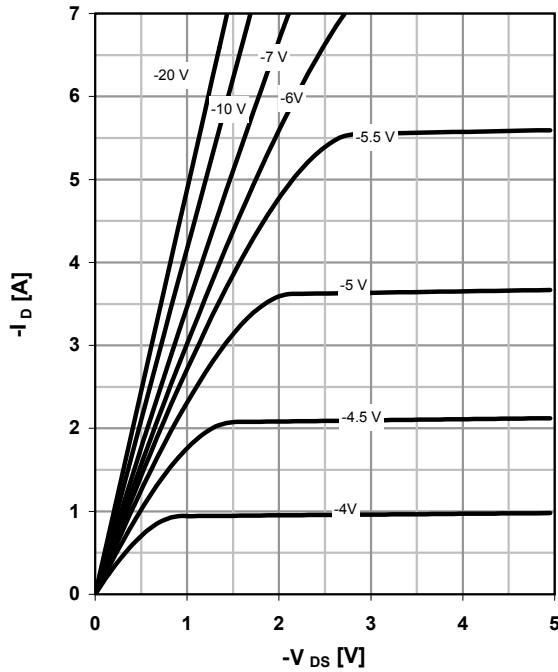
parameter:  $D=t_p/T$



**5 Typ. output characteristics**

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

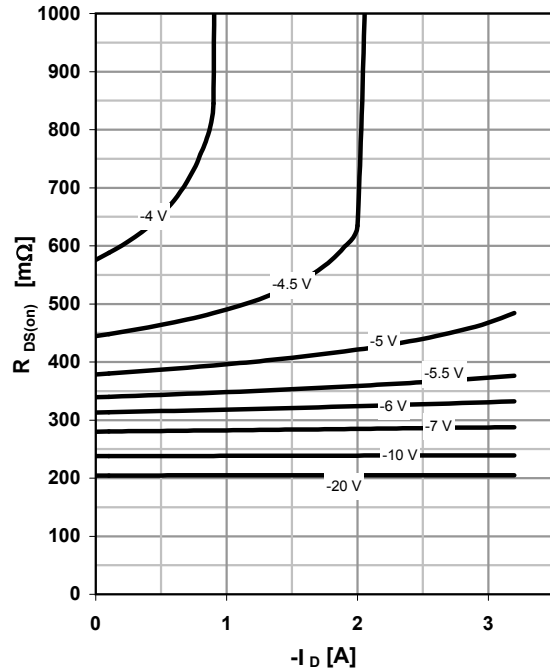
parameter:  $V_{GS}$



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

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

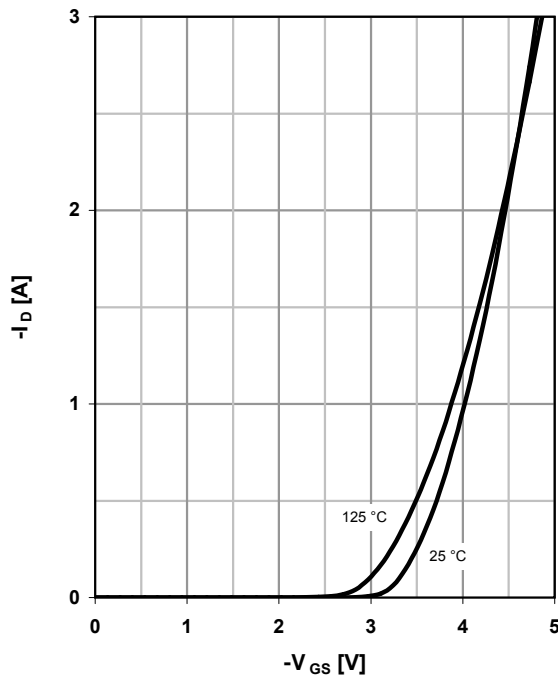
parameter:  $V_{GS}$



**7 Typ. transfer characteristics**

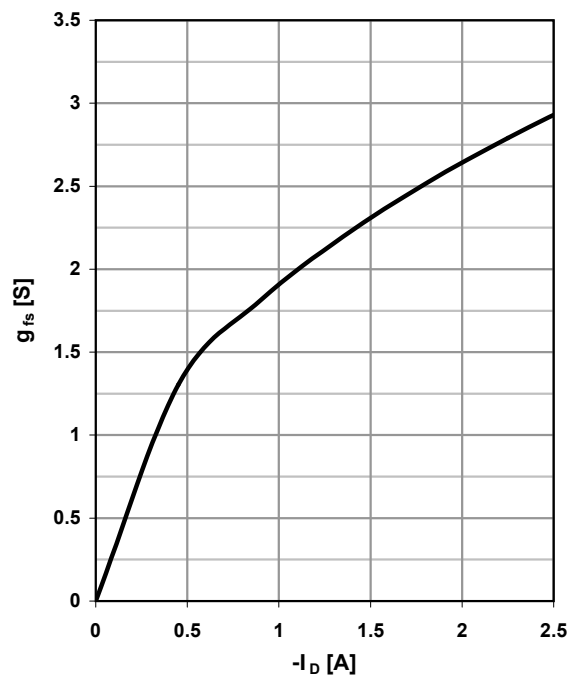
$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$

parameter:  $T_j$



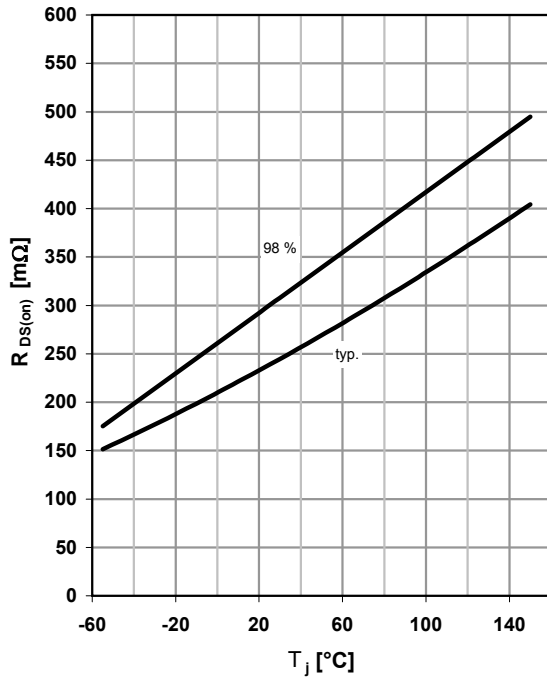
**8 Typ. forward transconductance**

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



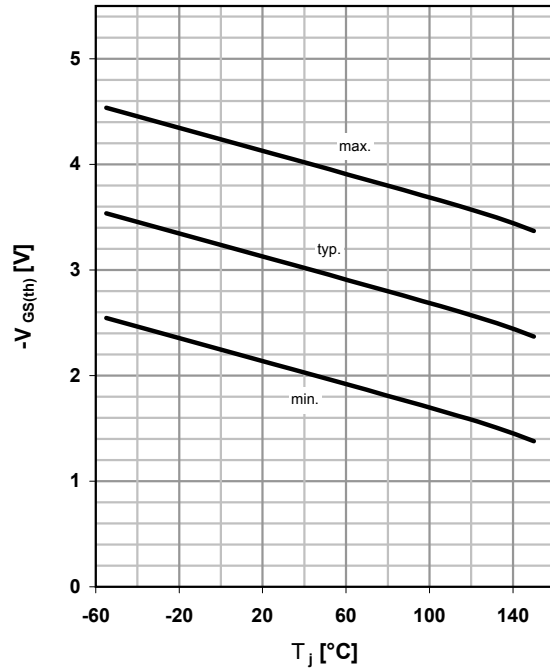
9 Drain-source on-state resistance

$R_{DS(on)} = f(T_j); I_D = -1.9 \text{ A}; V_{GS} = -10 \text{ V}$



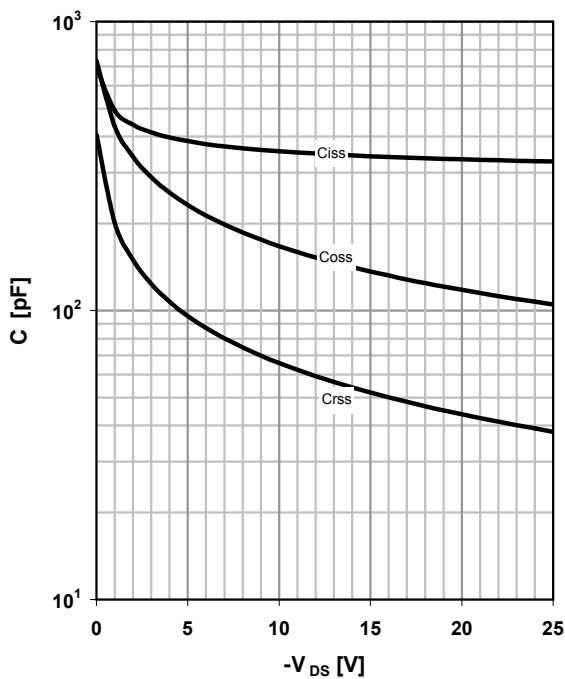
10 Typ. gate threshold voltage

$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; I_D = -250 \mu\text{A}$



11 Typ. capacitances

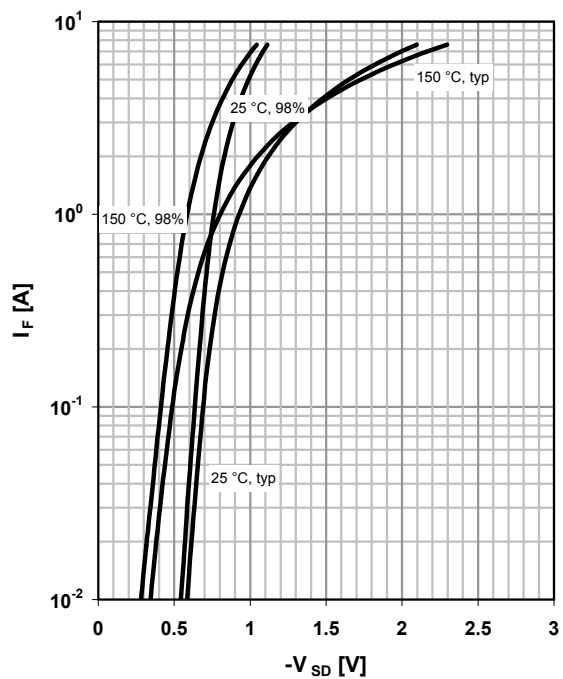
$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$



12 Forward characteristics of reverse diode

$I_F = f(V_{SD})$

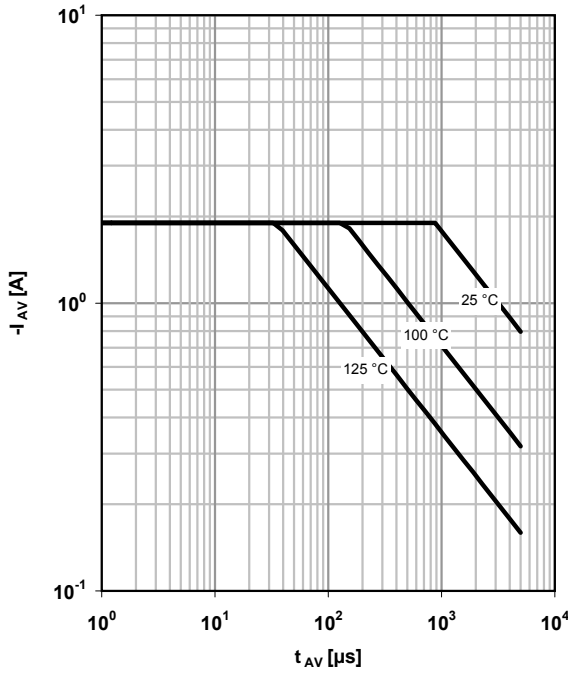
parameter:  $T_j$



**13 Avalanche characteristics**

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

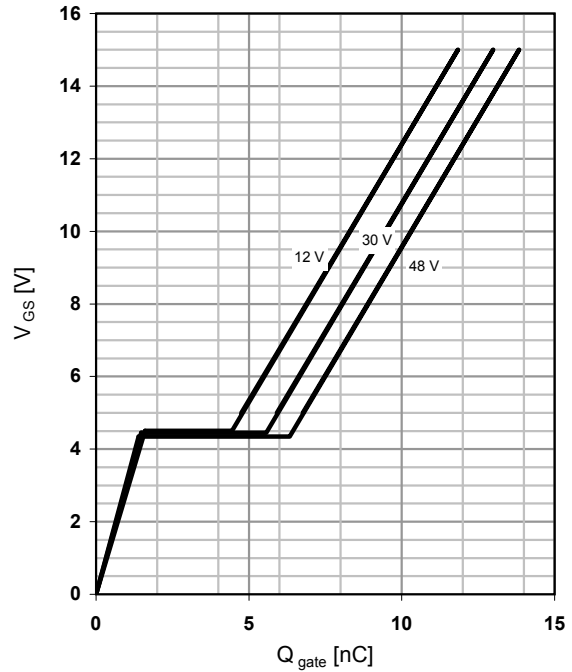
parameter:  $T_{j(start)}$



**14 Typ. gate charge**

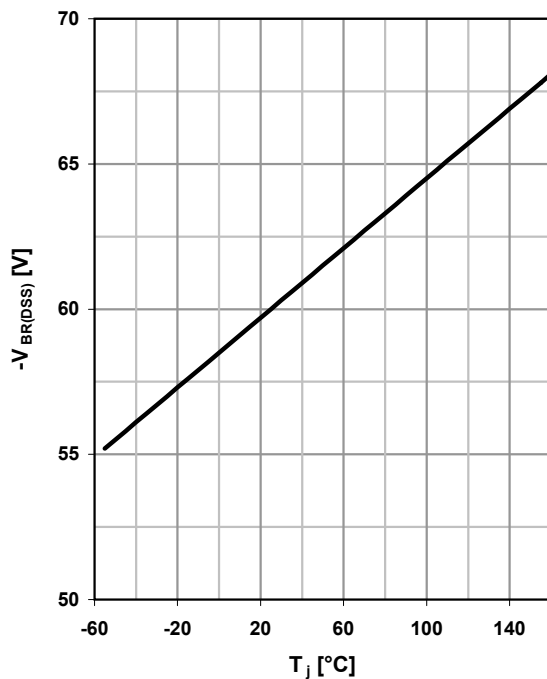
$V_{GS}=f(Q_{gate}); I_D=-1.9\ A\ pulsed$

parameter:  $V_{DD}$



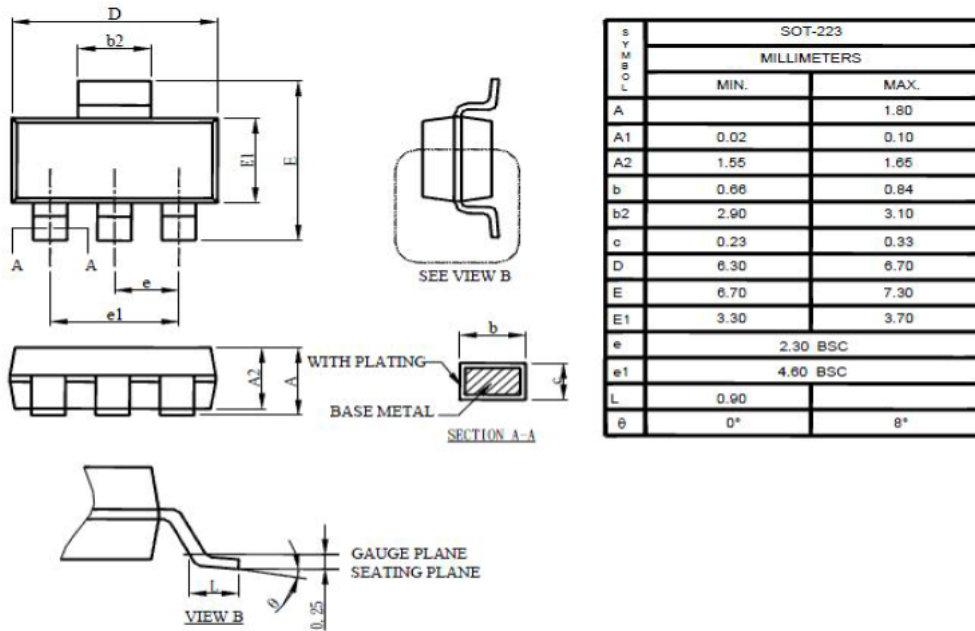
**15 Drain-source breakdown voltage**

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

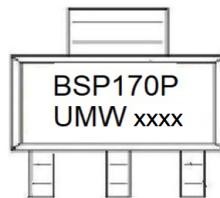


Package Outline

SOT-223:



Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW BSP170	SOT-223	2500	Tape and reel



单击下面可查看定价，库存，交付和生命周期等信息

[>>UMW\(友台半导体\)](#)