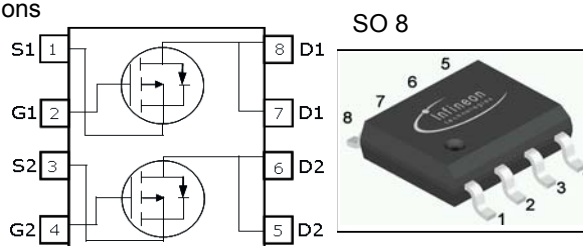


OptiMOS® -P Small-Signal-Transistor
Features

- Dual P-Channel in SO8
- Enhancement mode
- Logic level
- 150°C operating temperature
- Qualified according JEDEC for target applications
- Halogen-free according to IEC61249-2-21


Halogen-Free
Product Summary

V_{DS}		-30	V
$R_{DS(on),max}$	$V_{GS} = -10V$	21	mΩ
	$V_{GS} = -4.5V$	32	
I_D		-8.2	A



Type	Package	Marking	Lead free	Halogen free	Packing
BSO303P H	PG-DSO- 8	303P	Yes	Yes	dry

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

Parameter	Symbol	Conditions	Value		Unit
			10 secs	steady state	
Continuous drain current ¹⁾	I_D	$T_C=25\text{ °C}$	-8.2	-7.0	A
		$T_C=70\text{ °C}$	-6.6	-5.8	
Pulsed drain current ²⁾	$I_{D,pulse}$	$T_C=25\text{ °C}$	-32.8		
Avalanche energy, single pulse	E_{AS}	$I_D=-8.2\text{ A}, R_{GS}=25\text{ }\Omega$	97		mJ
Gate source voltage	V_{GS}		± 20		V
Power dissipation	P_{tot}	$T_A=25\text{ °C}$	2		W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150		°C
ESD class		JESD22-A114 HBM	1B (500V - 1kV)		
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 - soldering point	R_{thJS}		-	-	50	K/W
SMD version, device on PCB:	R_{thJA}	minimal footprint, $t < 10s$			110	
		minimal footprint, steady state			150	
		6 cm ² cooling area ¹⁾ $t < 10s$	-	-	62.5	
		6 cm ² cooling area ¹⁾ , steady state	-	-	80	

Electrical characteristics, at $T_j = 25^\circ C$, unless otherwise specified
Static characteristics

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0 V, I_D = -250 \mu A$	-30	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -100 \mu A$	-1	-1.5	-2	
Zero gate voltage drain current	I_{DSS}	$V_{DS} = -30 V, V_{GS} = 0 V,$ $T_j = 25^\circ C$	-	-0.1	-1	μA
		$V_{DS} = -30 V, V_{GS} = 0 V,$ $T_j = 150^\circ C$	-	-10	-100	
Gate-source leakage current	I_{GSS}	$V_{GS} = -20 V, V_{DS} = 0 V$	-	-	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = -4.5 V, I_D = -6.6 A$	-	25	32	mW
		$V_{GS} = -10 V, I_D = -8.2 A$	-	17	21	
Transconductance	g_{fs}	$ V_{DS} > 2 I_D R_{DS(on)max},$ $I_D = -6.6 A$	11	27	-	S

¹⁾ Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm² (one layer, 70 μm thick) copper area for drain connection. PCB is vertical without blown air; ≤ 10 sec.

²⁾ See figure3 for more detailed information

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	

Dynamic characteristics

Input capacitance	C_{iss}	$V_{GS}=0\text{ V}, V_{DS}=-25\text{ V},$ $f=1\text{ MHz}$	-	1785	2678	pF
Output capacitance	C_{oss}		-	510	765	
Reverse transfer capacitance	C_{rss}		-	425	638	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=-15\text{ V}, V_{GS}=-$ $10\text{ V}, I_D=-1\text{ A}, R_G=6\ \Omega$	-	11	17	ns
Rise time	t_r		-	13	20	
Turn-off delay time	$t_{d(off)}$		-	55	83	
Fall time	t_f		-	39	59	

Gate Charge Characteristics³⁾

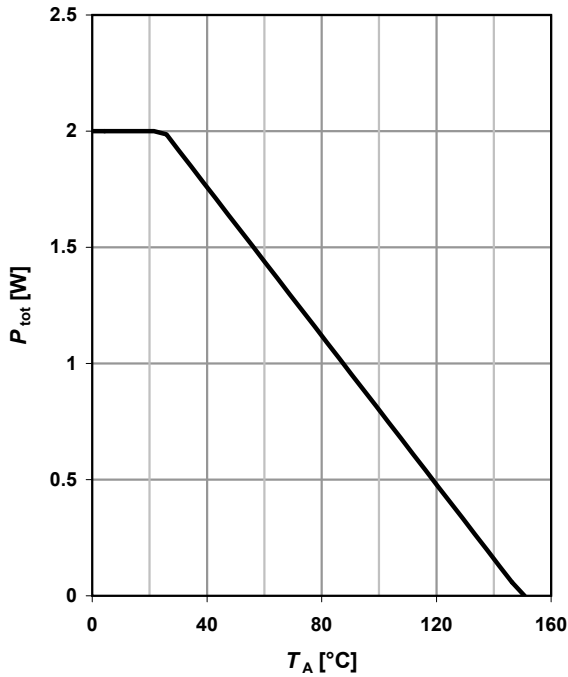
Gate to source charge	Q_{gs}	$V_{DD}=-24\text{ V}, I_D=-8.2\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	-5	-6	nC
Gate to drain charge	Q_{gd}		-	-14	-20	
Gate charge total	Q_g		-	-36	-49	
Gate plateau voltage	$V_{plateau}$		-	-2.7	-	

Reverse Diode

Diode continuous forward current	I_S	$T_C=25\text{ }^\circ\text{C}$	-	-	-2.2	A
Diode direct current, pulsed	I_{SM}		-	-	-32.8	
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=-8.2\text{ A},$ $T_j=25\text{ }^\circ\text{C}$	-	-0.9	-1.3	V
Reverse recovery time	t_{rr}	$V_R=-15\text{ V}, I_F= I_S ,$ $di_F/dt=100\text{ A}/\mu\text{s}$	-	24	36	ns
Reverse recovery charge	Q_{rr}		-	13	19	

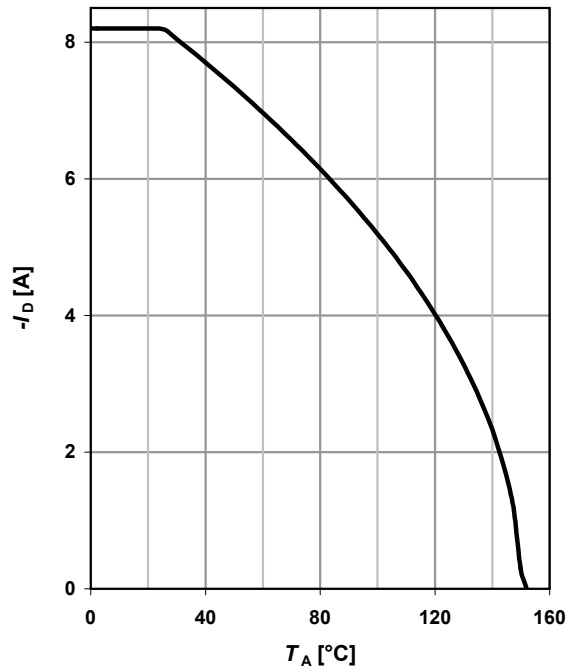
1 Power dissipation

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



2 Drain current

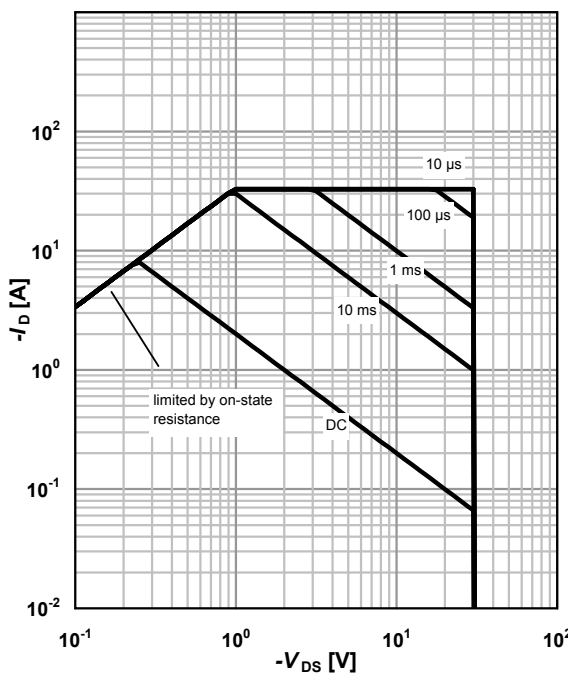
$$I_D = f(T_A); |V_{GS}| \geq 10 \text{ V}$$



3 Safe operating area

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

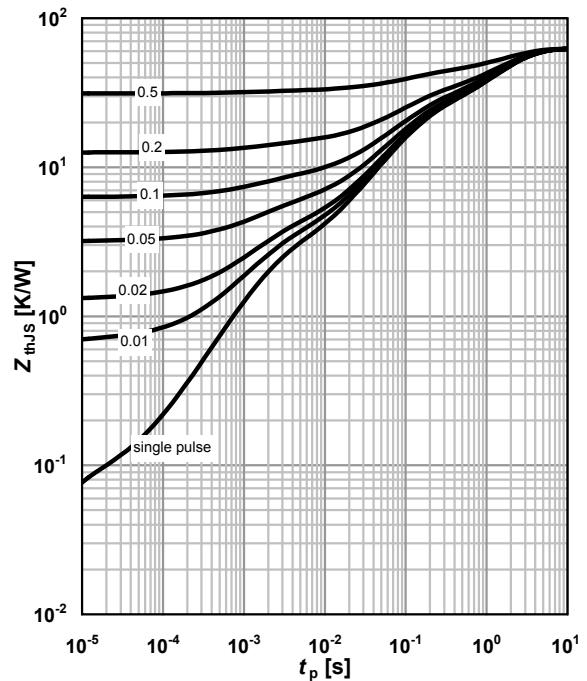
parameter: t_p



4 Max. transient thermal impedance

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

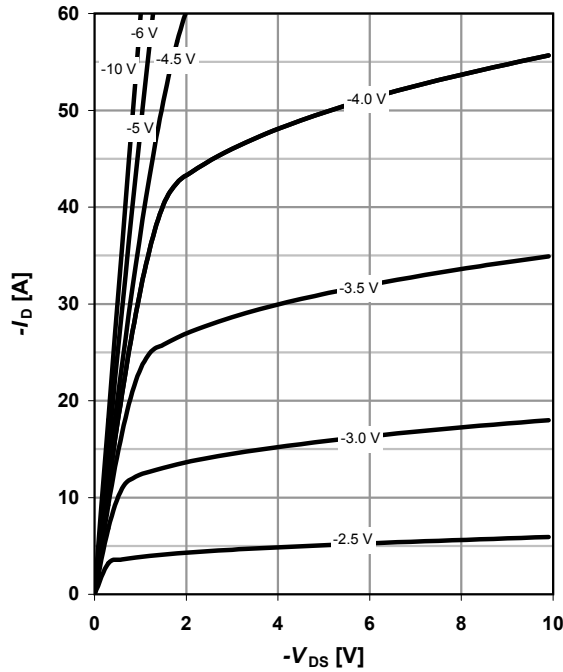
parameter: $D = t_p / T$



5 Typ. output characteristics

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

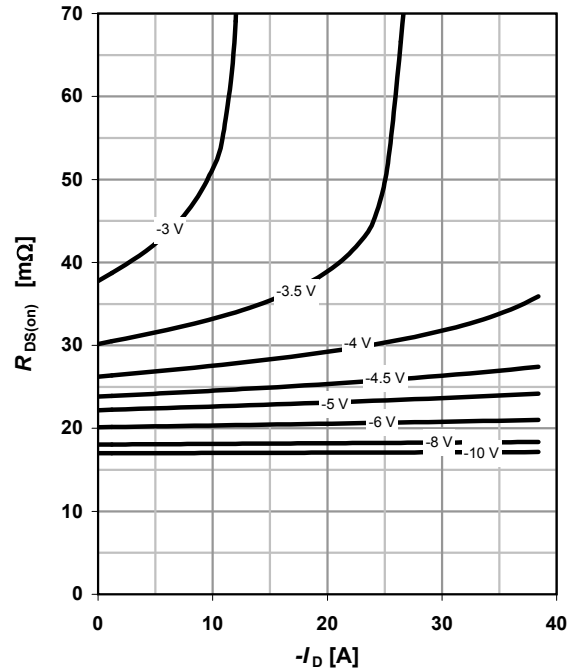
parameter: V_{GS}



6 Typ. drain-source on resistance

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

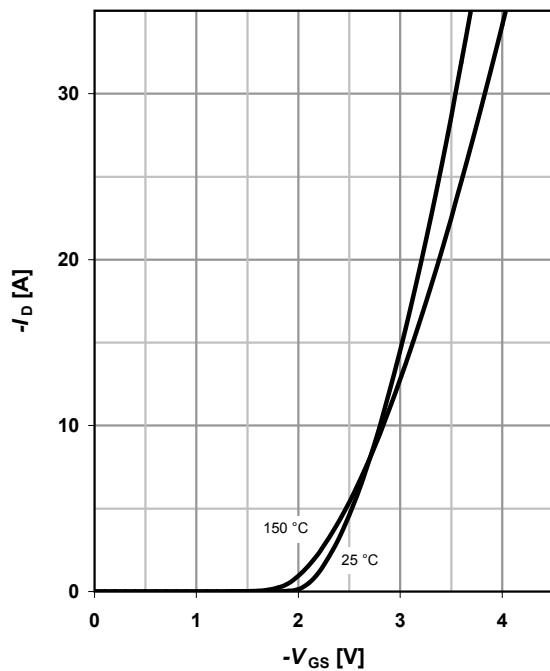
parameter: V_{GS}



7 Typ. transfer characteristics

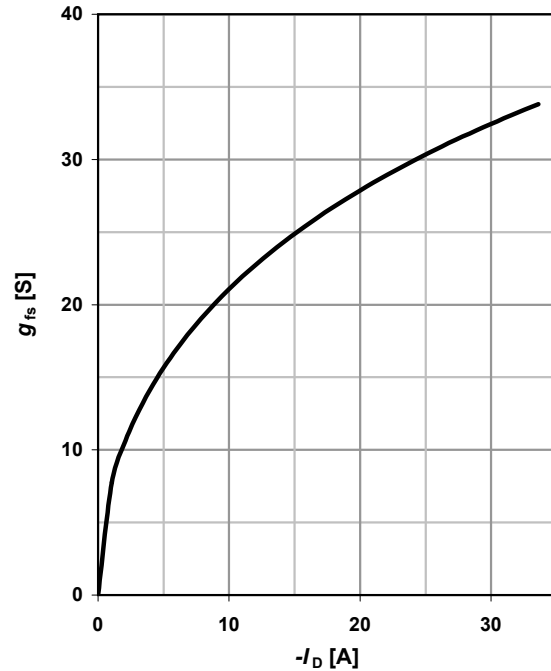
$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$

parameter: T_j



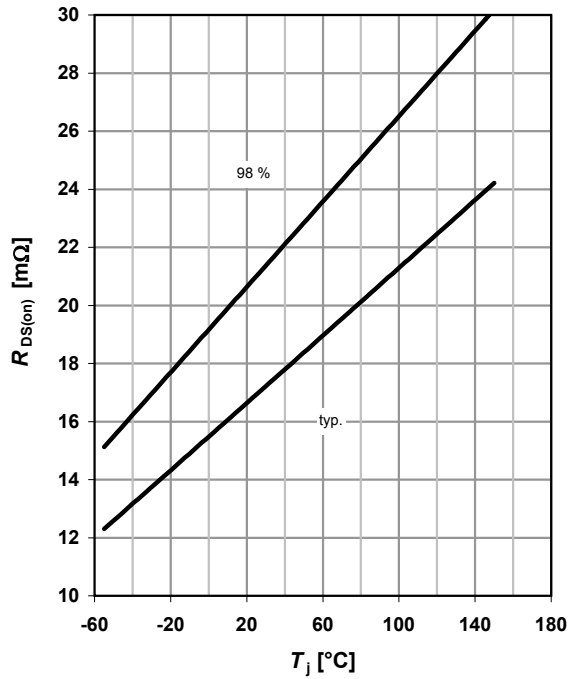
8 Typ. forward transconductance

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



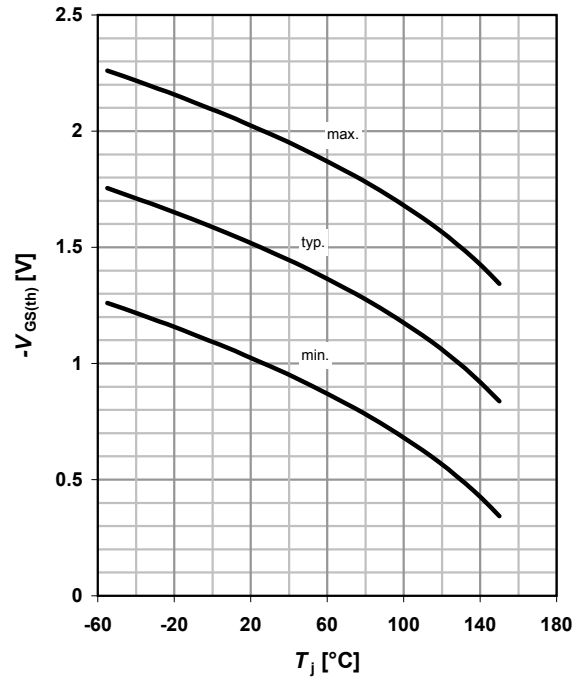
9 Drain-source on-state resistance

$R_{DS(on)} = f(T_j); I_D = -8.2 \text{ A}; V_{GS} = -10 \text{ V}$



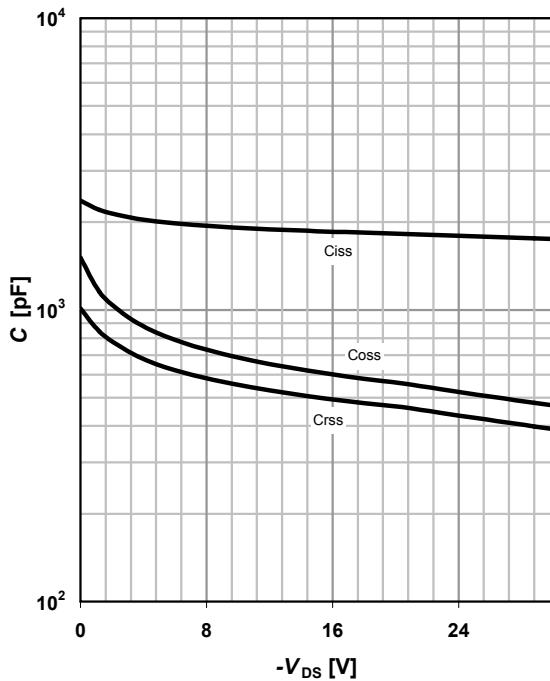
10 Typ. gate threshold voltage

$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; I_D = -100 \mu\text{A}$



11 Typ. capacitances

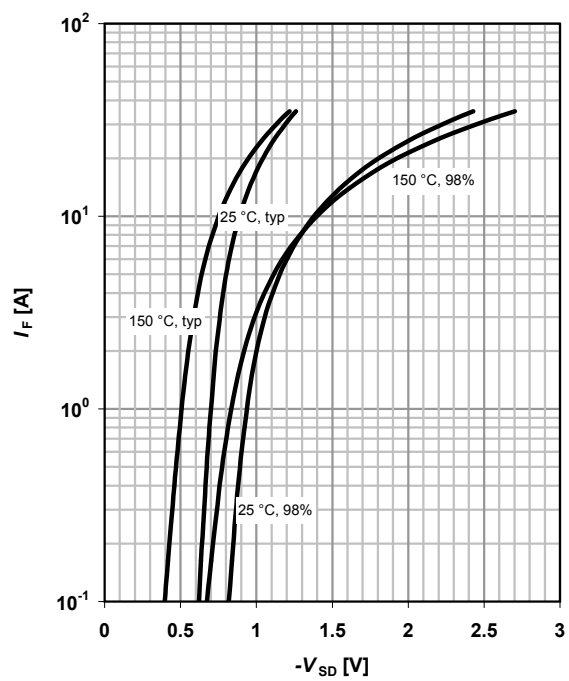
$C = f(V_{DS}); V_{GS} = 0 \text{ V}; f = 1 \text{ MHz}$



12 Forward characteristics of reverse diode

$I_F = f(V_{SD})$

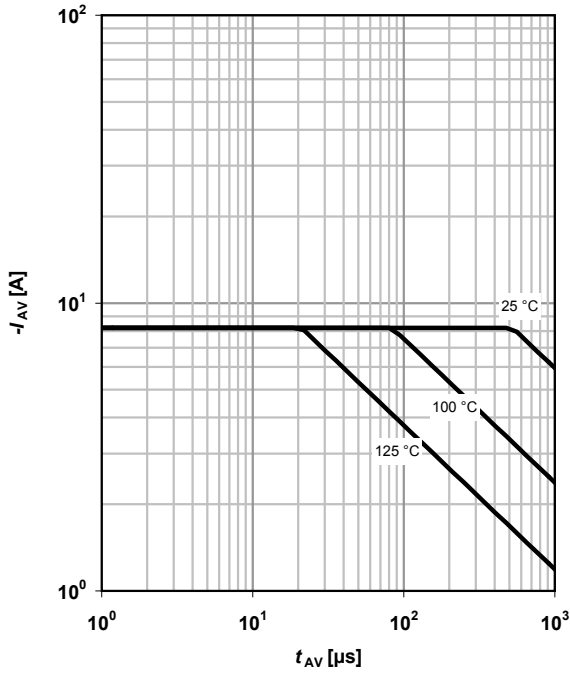
parameter: T_j



13 Avalanche characteristics

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

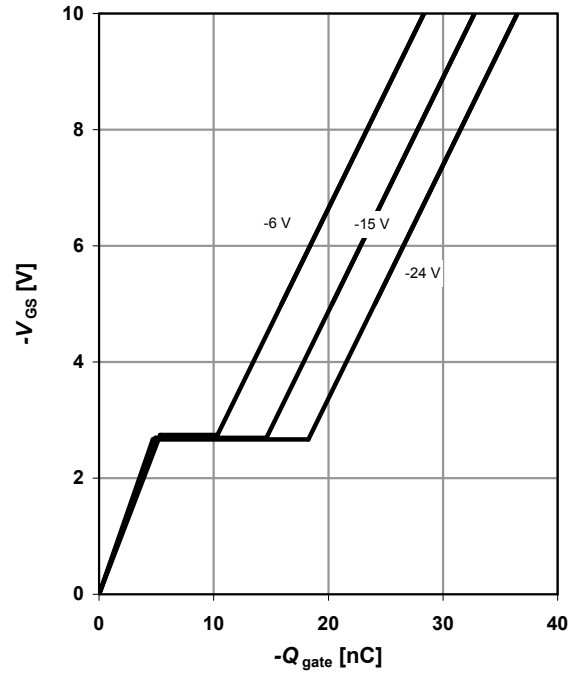
parameter: $T_{j(start)}$



14 Typ. gate charge

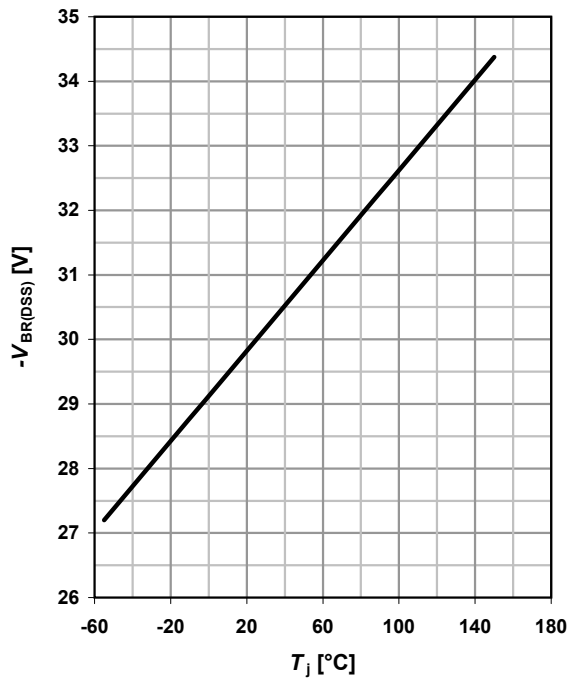
$V_{GS}=f(Q_{gate}); I_D=-8.2 \text{ A pulsed}$

parameter: V_{DD}



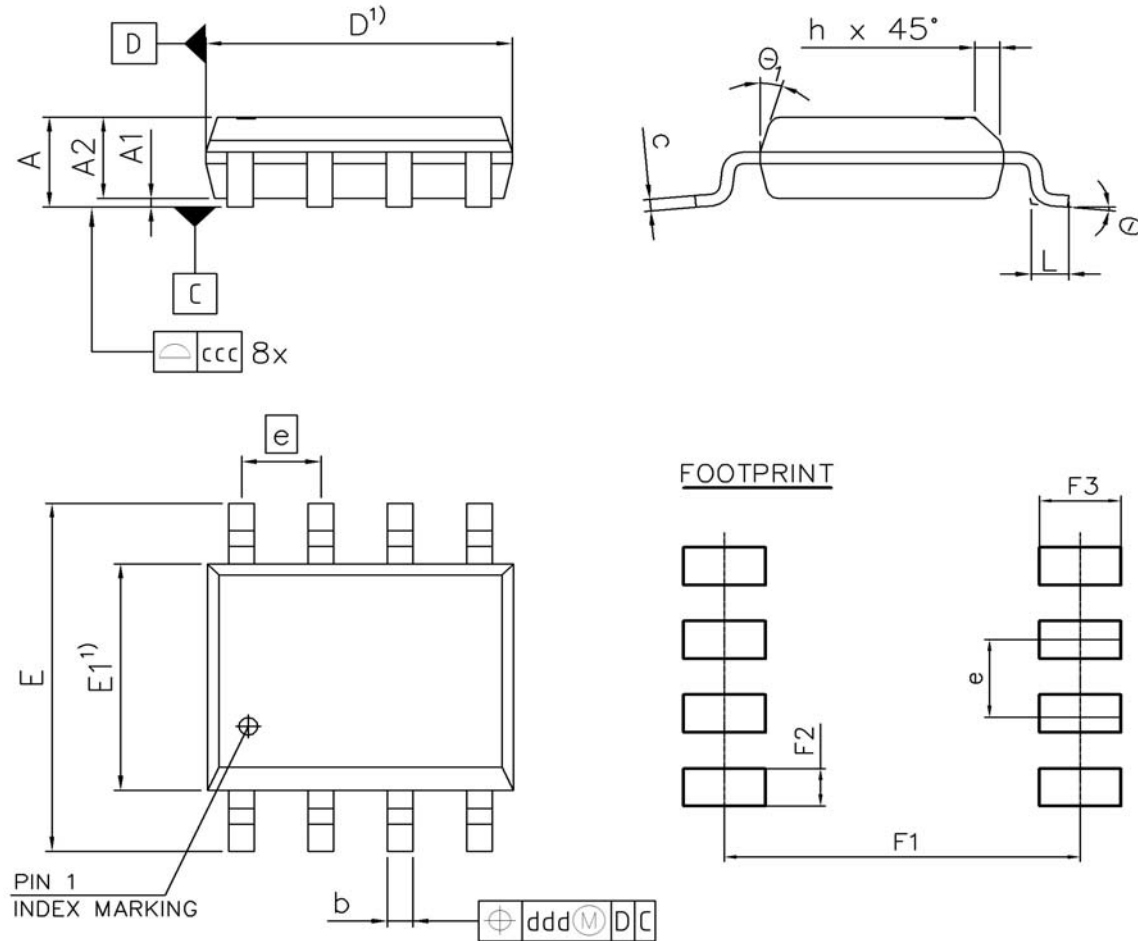
15 Drain-source breakdown voltage

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



Package Outline

PG-DSO-8: Outline



1) DOES NOT INCLUDE MOLD FLASH OR PROTRUSIONS.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	1.75	-	0.069
A1	0.10	-	0.004	-
A2	1.25	1.65	0.049	0.065
b	0.35	0.51	0.014	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27		0.050	
N	8		8	
L	0.39	0.89	0.015	0.035
h	0.23	0.50	0.009	0.020
θ	0°	8°	0°	8°
θ ₁	-	19°	-	19°
ccc	0.10		0.004	
ddd	0.25		0.010	
F1	5.59	5.79	0.220	0.228
F2	0.55	0.75	0.022	0.030
F3	1.21	1.41	0.048	0.056

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