SIPMOS® Power-Transistor

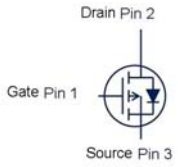
Features

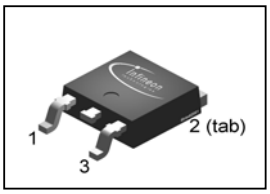
- P-Channel
- Enhancement mode
- Avalanche rated
- d*v*/d*t* rated
- 175°C operating temperature
- Pb-free lead finishing; RoHS compliant
- ° Qualified according to AEC Q101

Product Summary

V_{DS}	-60	V
$R_{DS(on),max}$	0.3	Ω
I_D	-8.8	A

PG-TO252-3





Type	Package	Tape and reel information	Marking	Lead free	Packing
SPD08P06PG	PG-TO252-3	1000 pcs / reel	08P06P	Yes	Non dry

Parameter	Symbol	Conditions	Value	Unit
			steady state	
Continuous drain current	I_D	T_A=25 °C	-8.83	A
		T_A=100 °C	-6.25	
Pulsed drain current	$I_{D,pulse}$	T_A=25 °C	-35.32	
Avalanche energy, single pulse	E_{AS}	I_D=8.83 A, R_{GS}=25 Ω	70	mJ
Avalanche energy, periodic limited by T_{jmax}	E_{AR}		4.2	
Reverse diode d*v*/d*t*	d*v*/d*t*	I_D=8.83 A, V_{DS}=48 V, d*i*/d*t*=-200 A/µs, $T_{j,max}$=175 °C	-6	kV/µs
Gate source voltage	V_{GS}		±20	V
Power dissipation	P_{tot}	T_A=25 °C	42	W
Operating and storage temperature	T_j, T_{stg}		"-55 ... +175"	°C
ESD class				
Soldering temperature			260 °C	
IEC climatic category; DIN IEC 68-1			55/175/56	

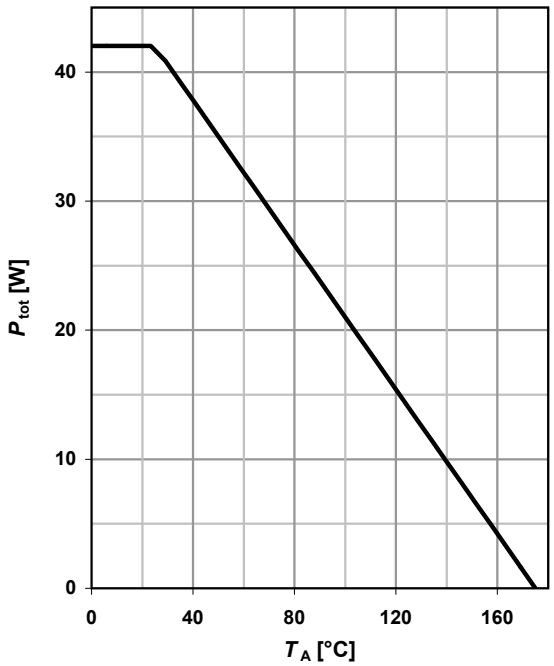
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - case	R_{thJC}		-	-	3.6	K/W
Thermal resistance, junction - ambient,leaded	R_{thJA}		-	-	-	
SMD version, device on PCB:	R_{thJA}	minimal footprint	-	-	75	K/W
		6 cm^2 cooling area[1)]	-	-	50	
Electrical characteristics, at T_j=25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0 V, I_D=-250 µA	-60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250 µA	-2.1	-3.0	-4	
Zero gate voltage drain current	I_{DSS}	V_{DS}=-60 V, V_{GS}=0 V, T_j=25 °C	-	-0.1	-1	µA
		V_{DS}=-60 V, V_{GS}=0 V, T_j=150 °C	-	-10	-100	
Gate-source leakage current	I_{GSS}	V_{GS}=-20 V, V_{DS}=0 V	-	-10	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=-6.2 V, I_D=-10 A	-	230	300	mΩ
Transconductance	g_{fs}	$\|V_{DS}\|>2\|I_D\|R_{DS(on)max}$, I_D=-6.2 A	2.5	4.9	-	S

[1)] Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6 cm^2 (one layer, 70µ, thick) copper area for drain connection. PCB is vertical without blown air.

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics						
Input capacitance	C_{iss}	V_{GS}=0 V, V_{DS}=-25 V, f=1 MHz	-	335	420	pF
Output capacitance	C_{oss}		-	105	135	
Reverse transfer capacitance	C_{rss}		-	65	95	
Turn-on delay time	$t_{d(on)}$	V_{DD}=-30 V, V_{GS}=-10 V, I_D=-6.2 A, R_G=6 Ω	-	16.0	24.0	
Rise time	t_r		-	46.0	69	
Turn-off delay time	$t_{d(off)}$		-	48	72	
Fall time	t_f		-	14	21	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=-48 V, I_D=-8.8 A, V_{GS}=0 to -10 V	-	-1.9	-2.6	nC
Gate to drain charge	Q_{gd}		-	-5	-8	
Gate charge total	Q_g		-	-10	-13	
Gate plateau voltage	$V_{plateau}$		-	-6	-	V
Reverse Diode						
Diode continuous forward current	I_S	T_A=25 °C	-	-	-8.80	A
Diode pulse current	$I_{S,pulse}$		-	-	-35.3	
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=-8.83 A, T_j=25 °C	-	-0.98	-1.55	V
Reverse recovery time	t_{rr}	V_R=30 V, I_F=$\|I_S\|$, di_F/dt=100 A/µs	-	60	90	ns
Reverse recovery charge	Q_{rr}		-	100	150	nC

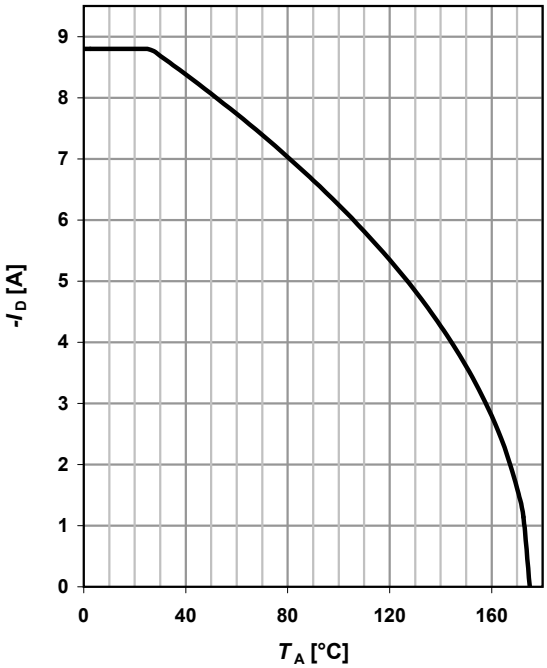
1 Power dissipation

$P_{tot}=f(T_A)$



2 Drain current

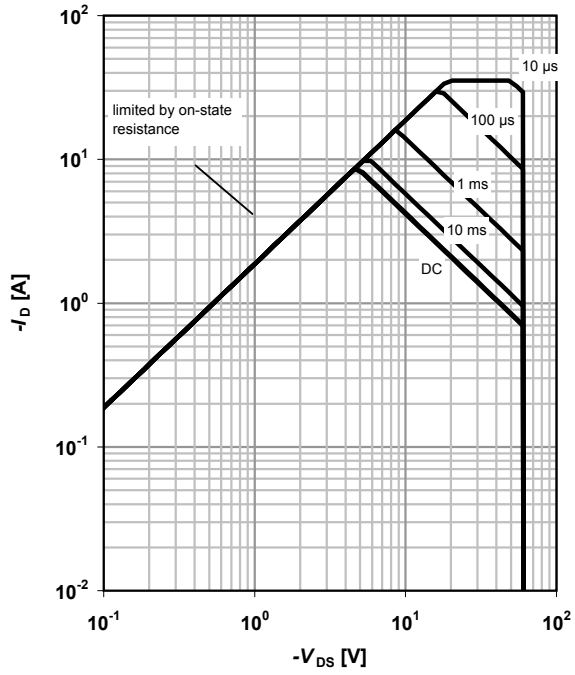
$I_D=f(T_A)$; $|V_{GS}|\geq 10$ V



3 Safe operating area

$I_D=f(V_{DS})$; $T_A=25$ °C; $D=0$

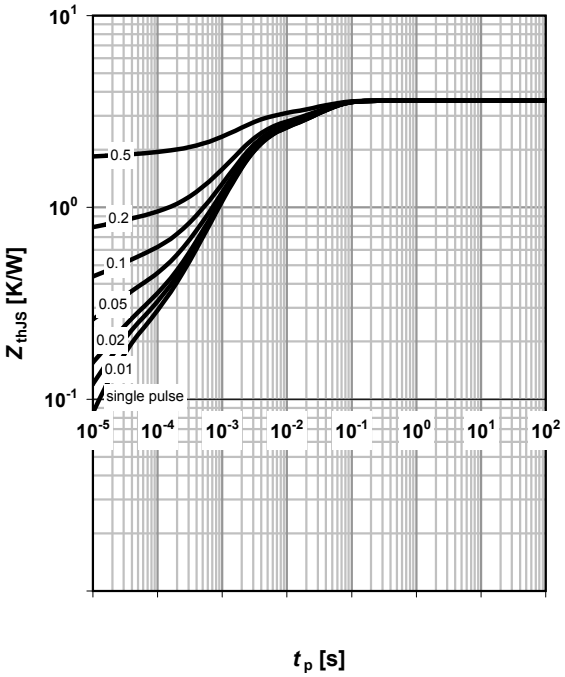
parameter: t_p



4 Max. transient thermal impedance

$Z_{thJA}=f(t_p)$

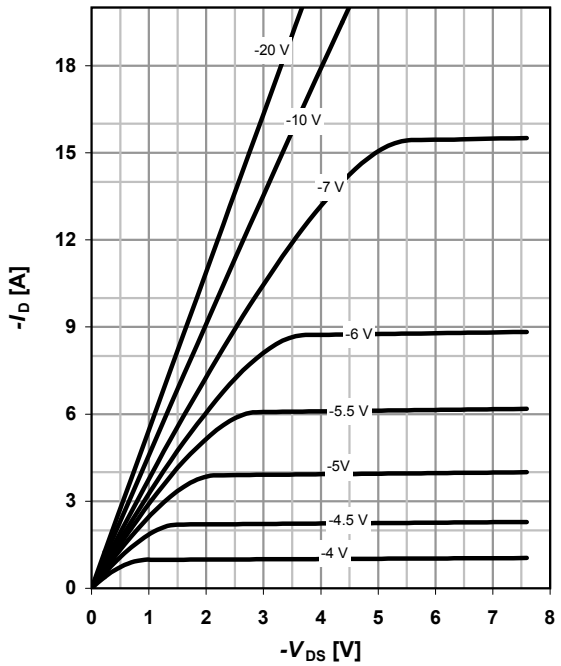
parameter: $D=t_p/T$



5 Typ. output characteristics

I_D=f(V_{DS}); T_j=25 °C

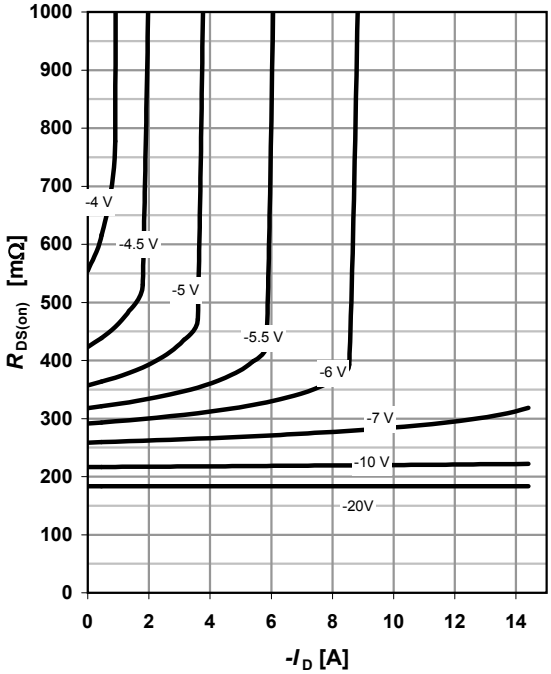
parameter: V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)}$=f(I_D); T_j=25 °C

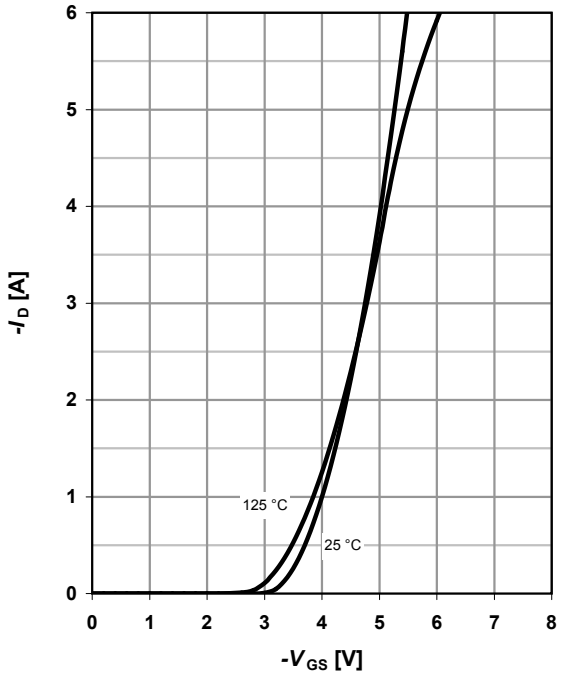
parameter: V_{GS}



7 Typ. transfer characteristics

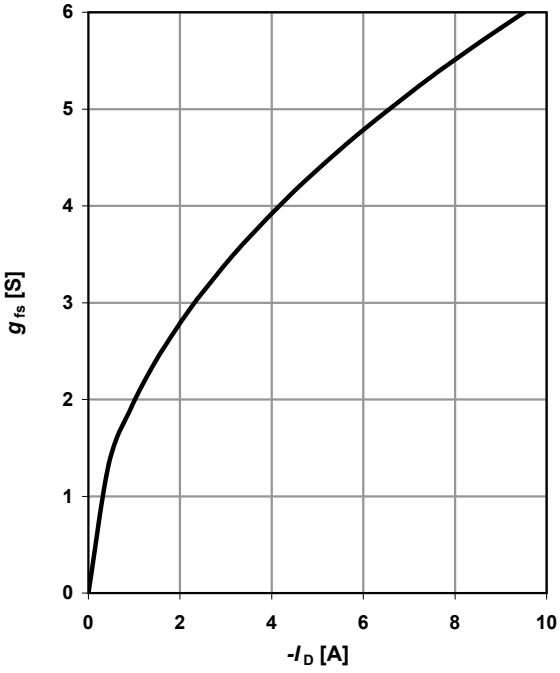
I_D=f(V_{GS}); $|V_{DS}|>2|I_D|R_{DS(on)max}$

parameter: T_j



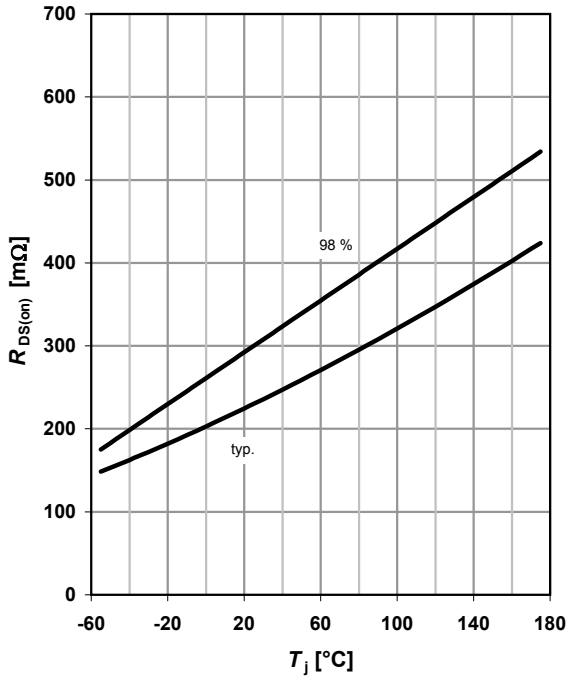
8 Typ. forward transconductance

g_{fs}=f(I_D); T_j=25 °C



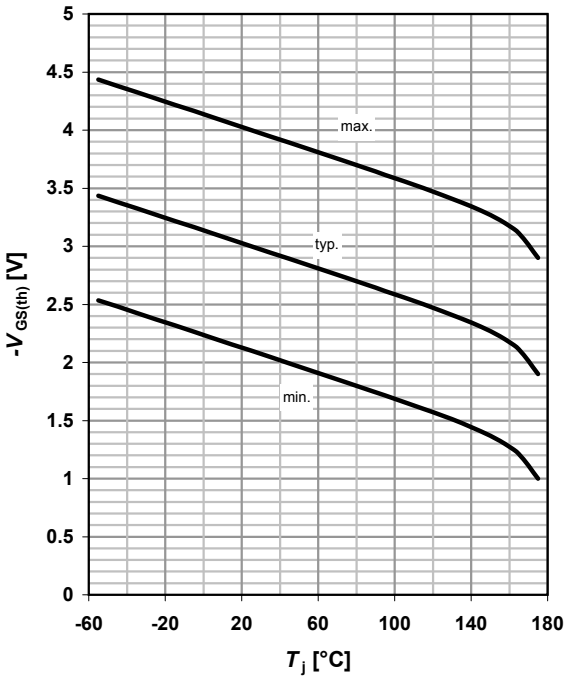
9 Drain-source on-state resistance

$R_{DS(on)}$=f(T_j); I_D=-6.2 A; V_{GS}=-10 V



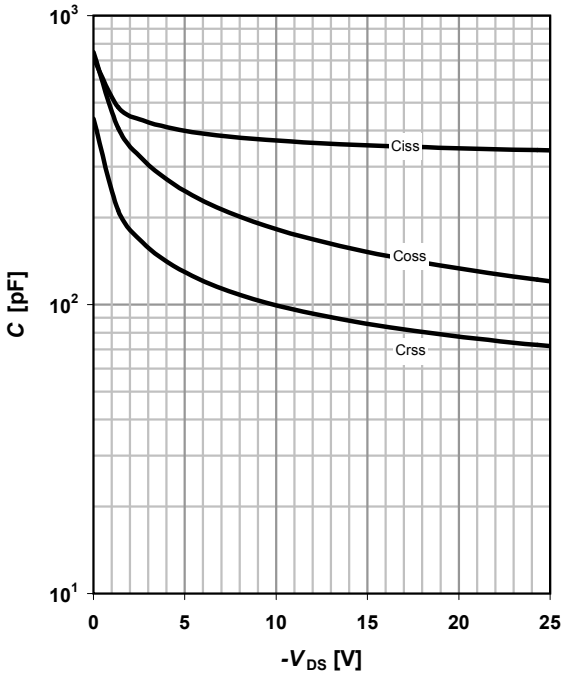
10 Typ. gate threshold voltage

$V_{GS(th)}$=f(T_j); V_{GS}=V_{DS}; I_D=-250 µA



11 Typ. capacitances

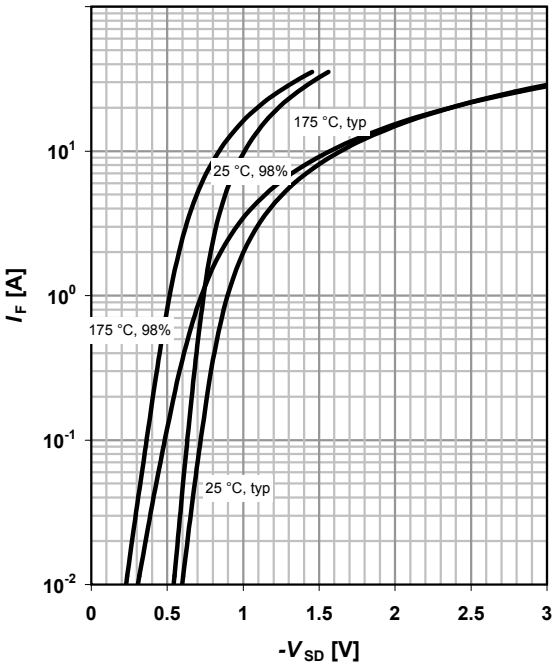
C=f(V_{DS}); V_{GS}=0 V; f=1 MHz



12 Forward characteristics of reverse diode

I_F=f(V_{SD})

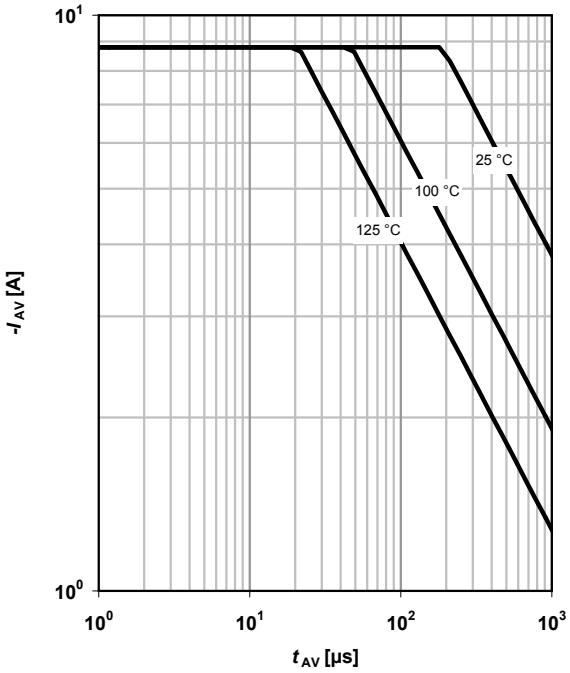
parameter: T_j



13 Avalanche characteristics

I_{AS}=f(t_{AV}); R_{GS}=25 Ω

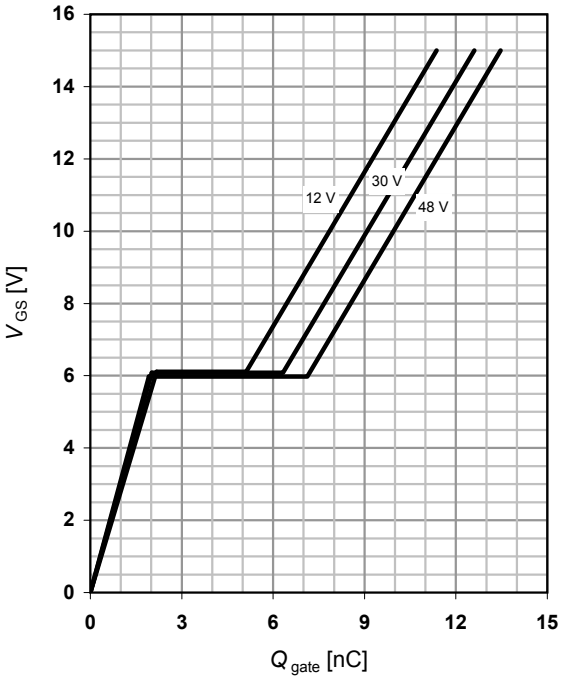
parameter: $T_{j(start)}$



14 Typ. gate charge

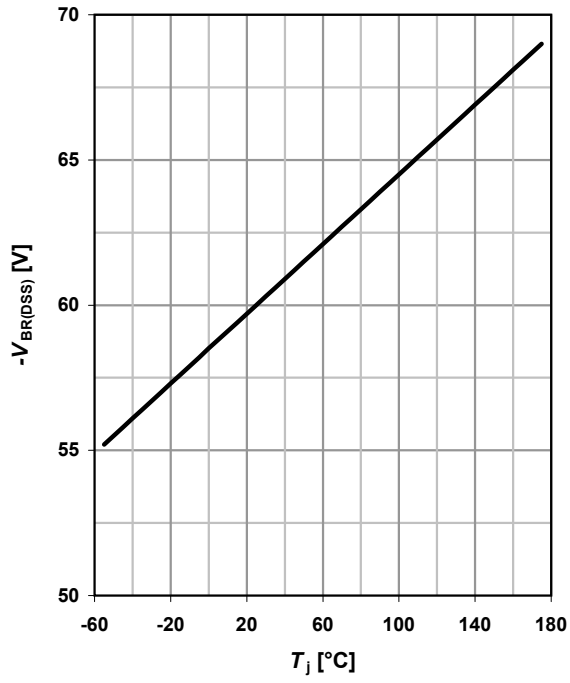
V_{GS}=f(Q_{gate}); I_D=-8.8 A pulsed

parameter: V_{DD}

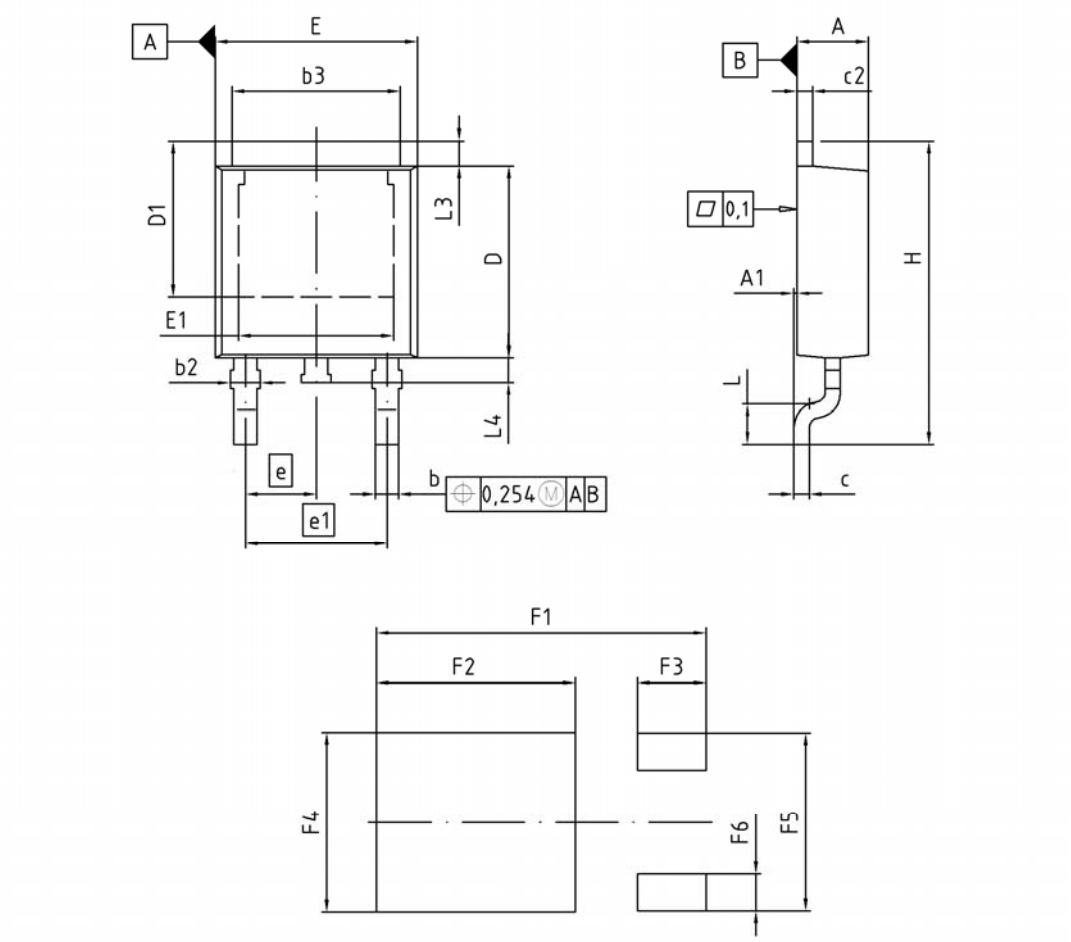


15 Drain-source breakdown voltage

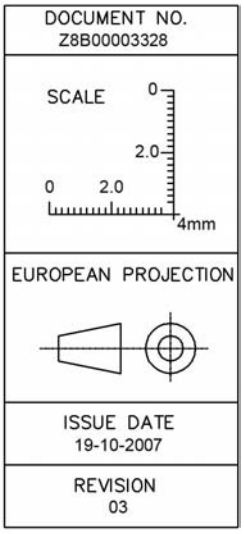
$V_{BR(DSS)}$=f(T_j); I_D=-250 µA



Package outline: PG-TO252-3



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.16	2.41	0.085	0.095
A1	0.00	0.15	0.000	0.006
b	0.64	0.89	0.025	0.035
b2	0.65	1.15	0.026	0.045
b3	5.00	5.50	0.197	0.217
c	0.46	0.60	0.018	0.024
c2	0.46	0.98	0.018	0.039
D	5.97	6.22	0.235	0.245
D1	5.02	5.84	0.198	0.230
E	6.40	6.73	0.252	0.265
E1	4.70	5.21	0.185	0.205
e	2.29		0.090	
e1	4.57		0.180	
N	3		3	
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L3	0.90	1.25	0.035	0.049
L4	0.51	1.00	0.020	0.039
F1	10.50	10.70	0.413	0.421
F2	6.30	6.50	0.248	0.256
F3	2.10	2.30	0.083	0.091
F4	5.70	5.90	0.224	0.232
F5	5.66	5.86	0.223	0.231
F6	1.10	1.30	0.043	0.051



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