

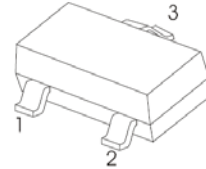
Features

- $V_{DS} (V) = -30V$
- $R_{DS(ON)} < 80m\ \Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 130m\Omega$ ($V_{GS} = 4.5V$)

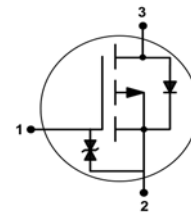
Product Summary

- P-channel
- Enhancement mode
- Logic level (4.5V rated)
- ESD protected

SOT - 23



1. GATE
2. SOURCE
3. DRAIN



Maximum ratings, at $T_j=25\ ^\circ C$, unless otherwise specified

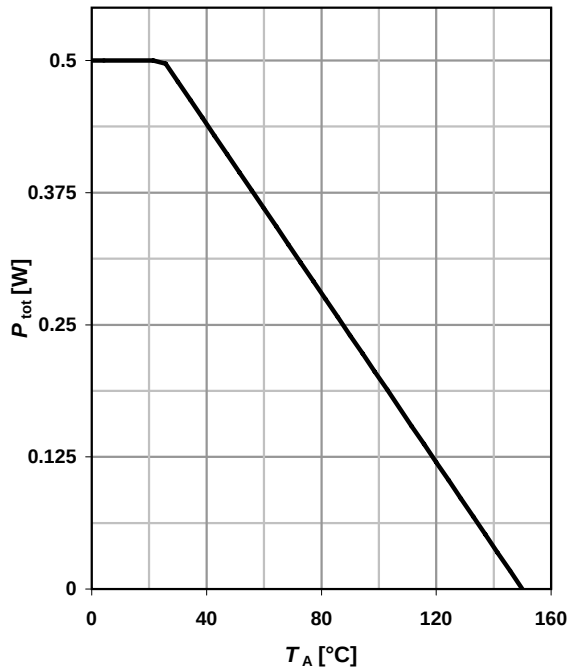
Parameter	Symbol	Conditions	Value	Unit
Continuous drain current	I_D	$T_A=25\ ^\circ C$	-2.0	A
		$T_A=70\ ^\circ C$	-1.6	
Pulsed drain current	$I_{D,pulse}$	$T_A=25\ ^\circ C$	-8.0	
Avalanche energy, single pulse	E_{AS}	$I_D=-2\ A, R_{GS}=25\ \Omega$	-10.7	mJ
Reverse diode dv/dt	dv/dt	$I_D=-2\ A,$ $V_{DS}=-16V,$ $di/dt=-200A/\mu s,$ $T_{j,max}=150\ ^\circ C$	6	kV/ μs
Gate source voltage	V_{GS}		± 20	V
Power dissipation ¹⁾	P_{tot}	$T_A=25\ ^\circ C$	0.5	W
Operating and storage temperature	T_j, T_{stg}		-55 ... 150	$^\circ C$
ESD Class		JESD22-A114 -HBM	2 (2kV to 4kV)	
Soldering Temperature			260 $^\circ C$	$^\circ C$
IEC climatic category; DIN IEC 68-1			55/150/56	$^\circ C$

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal characteristics						
Thermal resistance, junction - ambient	R _{thJA}	minimal footprint ¹⁾	-	-	250	K/W
Electrical characteristics, at T _j =25 °C, unless otherwise specified						
Static characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =-250µA	-30	-	-	V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-11µA	-2.0	-1.5	-1.0	
Drain-source leakage current	I _{DSS}	V _{DS} =-30V, V _{GS} =0 V, T _j =25 °C	-	-	-1	µA
		V _{DS} =-30V, V _{GS} =0V, T _j =150 °C	-	-	-100	
Gate-source leakage current	I _{GSS}	V _{GS} =-20V, V _{DS} =0V	-	-	-5	µA
Drain-source on-state resistance	R _{DS(on)}	V _{GS} =-4.5 V, I _D =-1.7 A	-	88	130	mΩ
		V _{GS} =-10 V, I _D =-2 A	-	62	80	
Transconductance	g _{fs}	V _{DS} >2 I _D R _{DS(on)} max, I _D =-1.6 A		4.6	-	S

¹⁾ Performed on 40mm² FR4 PCB. The traces are 1mm wide, 70μm thick and 20mm long; they are present on both sides of the PCB.

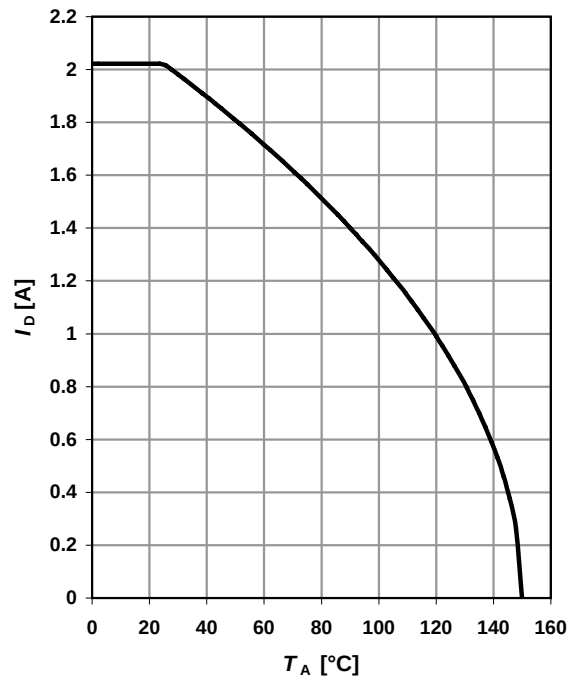
Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic characteristics						
Input capacitance	C _{iss}	V _{GS} =0 V, V _{DS} =-15 V, f=1 MHz	-	376	500	pF
Output capacitance	C _{oss}		-	196	261	
Reverse transfer capacitance	C _{rss}		-	12	18	
Turn-on delay time	t _{d(on)}	V _{DD} =-15V, V _{GS} =-10 V, I _D =-2 A, R _G =6 Ω	-	5.6	-	ns
Rise time	t _r		-	7.7	-	
Turn-off delay time	t _{d(off)}		-	15.3	-	
Fall time	t _f		-	2.8	-	
Gate Charge Characteristics						
Gate to source charge	Q _{gs}	V _{DD} =-15 V, I _D =-2 A, V _{GS} =0 to -10 V	-	-1.2	-	nC
Gate to drain charge	Q _{gd}		-	-0.6	-	
Gate charge total	Q _g		-	-5.0	-	
Gate plateau voltage	V _{plateau}		-	-3.1	-	V
Reverse Diode						
Diode continous forward current	I _S	T _A =25 °C	-	-	-0.4	A
Diode pulse current	I _{S,pulse}		-	-	-8.4	
Diode forward voltage	V _{SD}	V _{GS} =0 V, I _F =-2 A, T _j =25 °C	-	-0.8	-1.1	V
Reverse recovery time	t _{rr}	V _R =10 V, I _F =-2 A, di _F /dt=100 A/μs	-	14	-	ns
Reverse recovery charge	Q _{rr}		-	-5.9	-	nC

Typical Electrical Characteristics



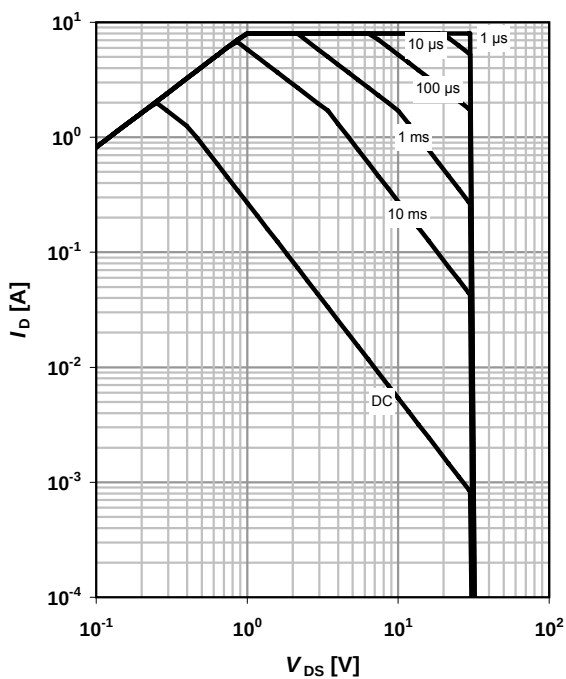
1 Power dissipation

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



2 Drain current

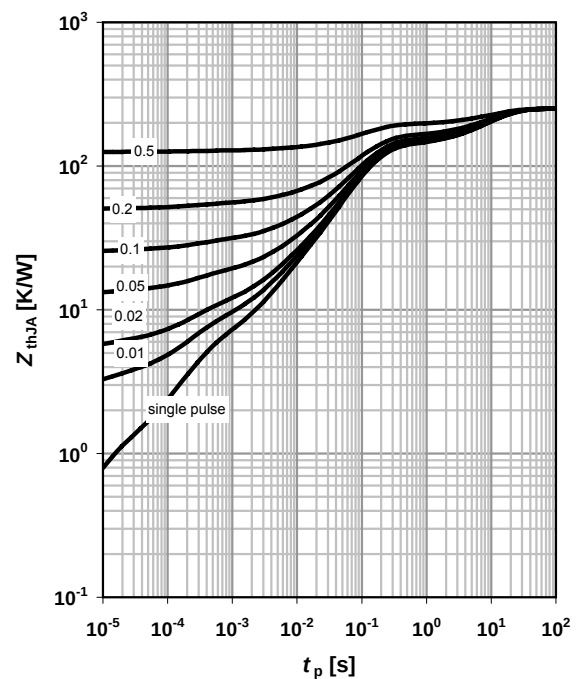
$$I_D = f(T_A); V_{GS} \geq 10 \text{ V}$$



3 Safe operating area

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

parameter: t_p

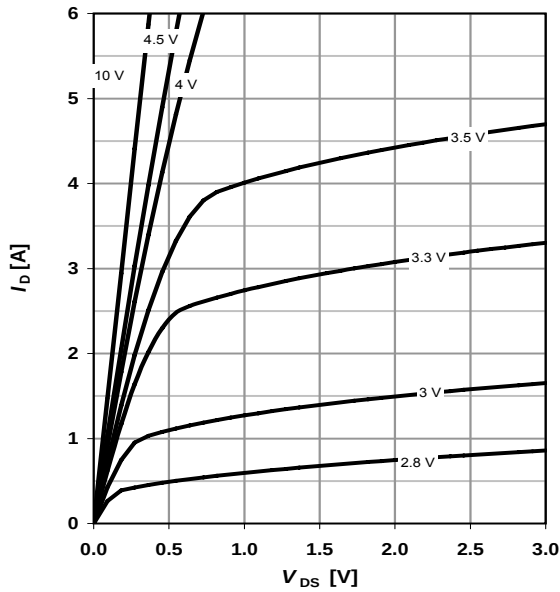


4 Max. transient thermal impedance

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

parameter: $D = t_p/T$

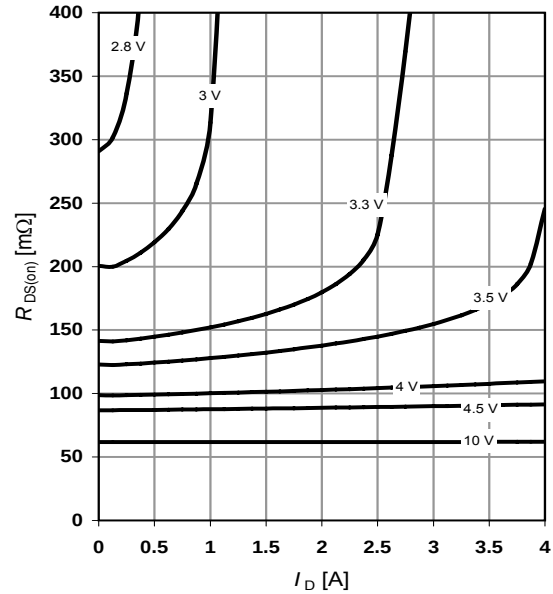
Typical Electrical Characteristics



5 Typ. output characteristics

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

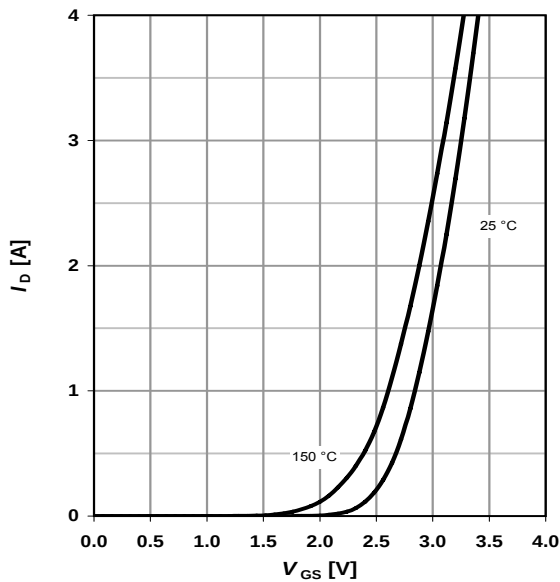
parameter: V_{GS}



6 Typ. drain-source on resistance

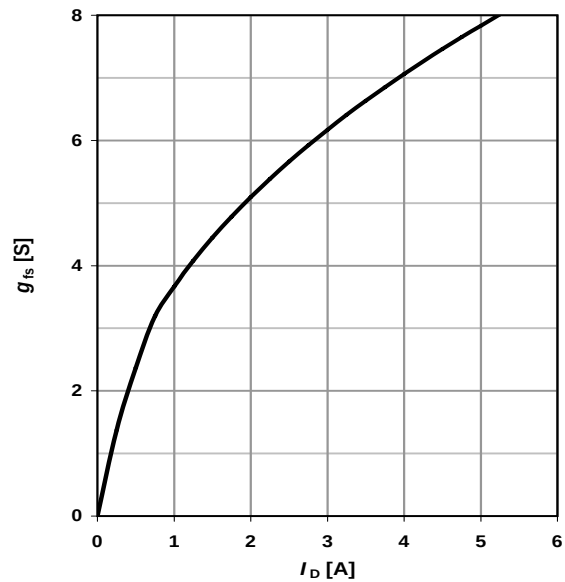
$$R_{DS(on)} = f(I_D); T_J = 25^\circ\text{C}$$

parameter: V_{GS}



7 Typ. transfer characteristics

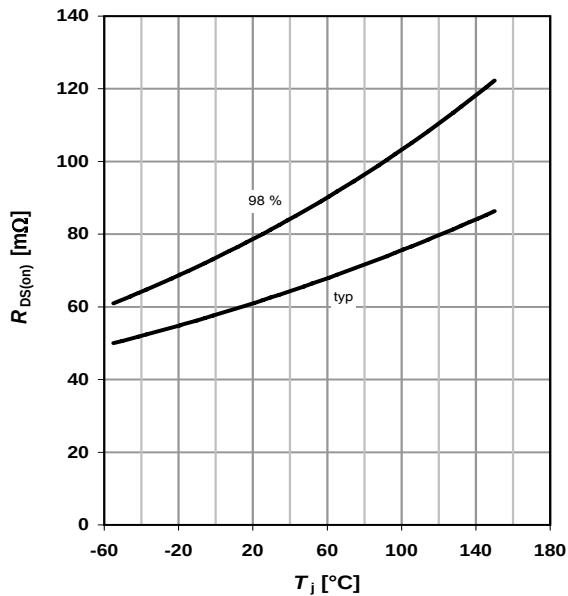
$$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}$$



8 Typ. forward transconductance

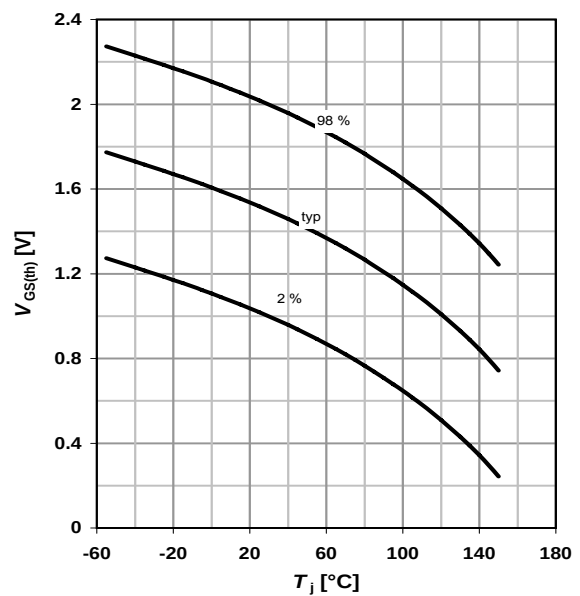
$$g_{fs} = f(I_D); T_J = 25^\circ\text{C}$$

Typical Electrical Characteristics



9 Drain-source on-state resistance

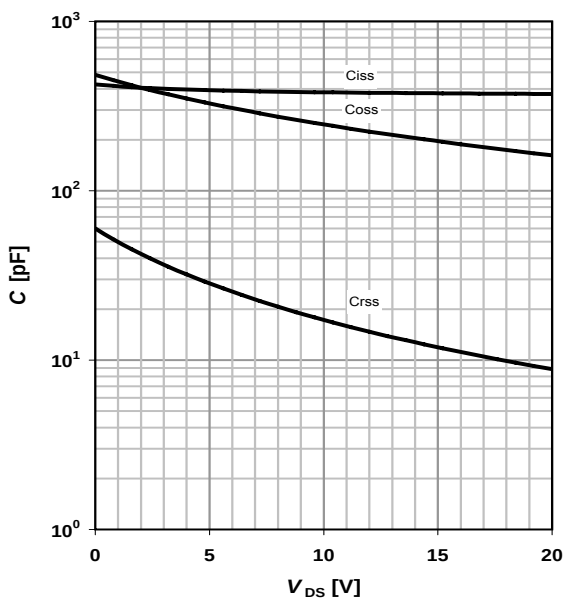
$$R_{DS(on)} = f(T_j); I_D = -2 \text{ A}; V_{GS} = -10 \text{ V}$$



10 Typ. gate threshold voltage

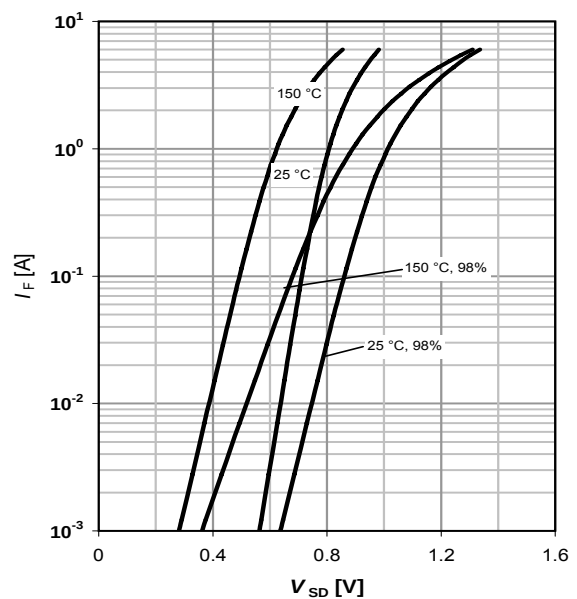
$$V_{GS(th)} = f(T_j); V_{DS} = V_{GS}; I_D = 11 \text{ μA}$$

parameter: I_D



11 Typ. capacitances

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

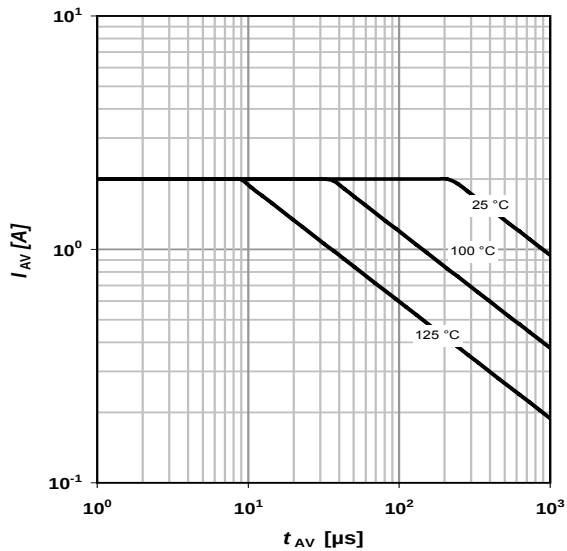


12 Forward characteristics of reverse diode

$$I_F = f(V_{SD})$$

parameter: T_j

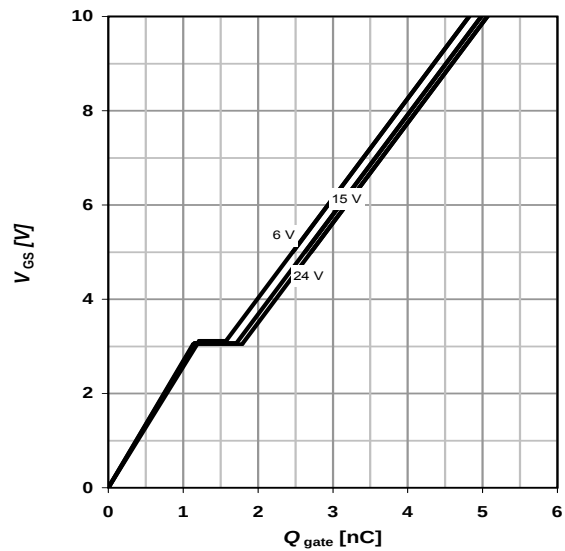
Typical Electrical Characteristics



13 Avalanche characteristics

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

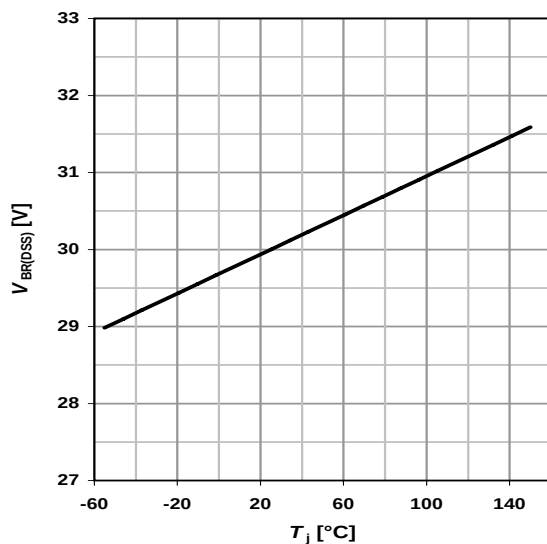
parameter: $T_{j(\text{start})}$



14 Typ. gate charge

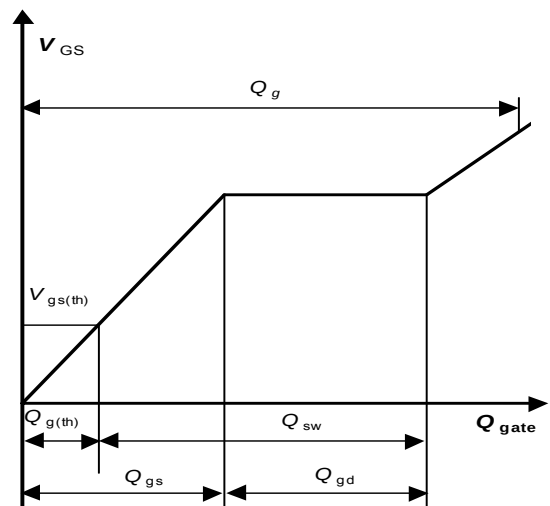
$$V_{GS}=f(Q_{\text{gate}}); I_D=-2\ \text{A pulsed}$$

parameter: V_{DD}



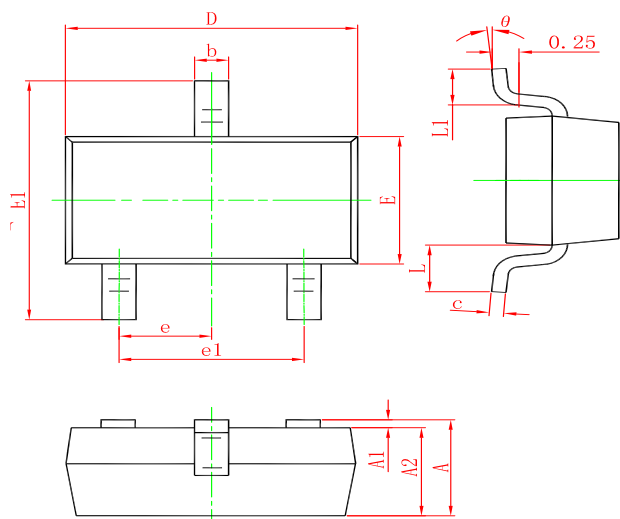
15 Drain-source breakdown voltage

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



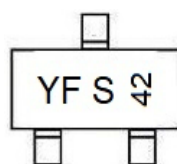
16 Gate charge waveforms

SOT-23 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW BSS308PE	SOT-23	3000	Tape and reel