2N7002

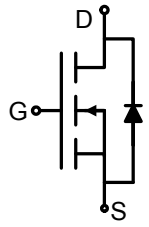
N-Channel Power MOSFET

General Features

- V_{DS} = 60V,I_D =0.115A
  $R_{DS(ON)}$ < 7.5 Ω@ V_{GS}=5V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

- Battery protection
- Load switch
- Power management



Schematic diagram

SOT-23 top view

■MAXIMUM RATINGS

Characteristic	Symbol	Max	Unit
Drain-Source Voltage	BV_{DSS}	60	V
Gate- Source Voltage	V_{GS}	±20	V
Drain Current (continuous)	I_{DR}	115	mA
Drain Current (pulsed)	I_{DRM}	800	mA

■THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation Derate above25℃	P_D	225 1.8	mW mW/℃
Thermal Resistance Junction to Ambient	$R_{\Theta JA}$	417	℃/W
Junction and Storage Temperature	T_J,T_{stg}	150℃, -55to+150℃	

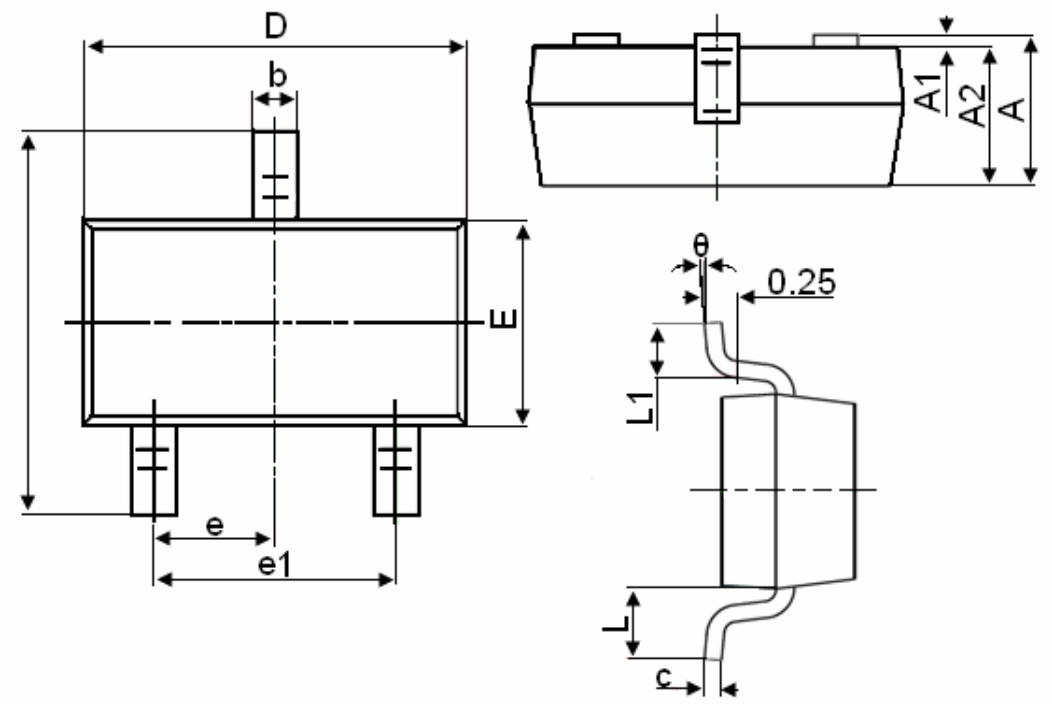
■ELECTRICAL CHARACTERISTICS

(T_A=25℃ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage (I_D =250uA,V_{GS}=0V)	BV_{DSS}	60	—	—	V
Gate Threshold Voltage (I_D =250uA,V_{GS}= V_{DS})	$V_{GS(th)}$	1.0	—	2.5	V
Drain-Source On Voltage (I_D=50mA,V_{GS}=5V) (I_D =500mA,V_{GS}=10V)	$V_{DS(ON)}$	—	—	0.375 3.75	V
Diode Forward Voltage Drop (I_{SD}=200mA,V_{GS}=0V)	V_{SD}	—	—	1.5	V
Zero Gate Voltage Drain Current (V_{GS}=0V, V_{DS}= BV_{DSS}) (V_{GS}=0V, V_{DS}=0.8BV_{DSS}, T_A=125℃)	I_{DSS}	—	—	1 500	uA
Gate Body Leakage (V_{GS}=±20V, V_{DS}=0V)	I_{GSS}	—	—	±100	nA
Static Drain-Source On-State Resistance (I_D=50mA,V_{GS}=5V) (I_D=500mA,V_{GS}=10V)	$R_{DS(ON)}$	—	—	7.5 7.5	Ω
Input Capacitance (V_{GS}=0V, V_{DS}=25V,f=1MHz)	C_{ISS}	—	—	50	pF
Common Source Output Capacitance (V_{GS}=0V, V_{DS}=25V,f=1MHz)	C_{OSS}	—	—	25	pF
Turn-ON Time (V_{DS}=30V, I_D=200mA, R_{GEN}=25Ω)	$t_{(on)}$	—	—	20	ns
Turn-OFF Time (V_{DS}=30V, I_D=200mA, R_{GEN}=25Ω)	$t_{(off)}$	—	—	40	ns
Reverse Recovery Time (I_{SD}=800mA, V_{GS}=0V)	t_{rr}	—	400	—	ns

1. FR-5=1.0×0.75×0.062in.
2. Alumina=0.4×0.3×0.024in.99.5%alumina.
3. Pulse Width≤300 μs; Duty Cycle≤2.0%.

SOT-23 Package Information



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°