

Description

- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Low input Capacitance
- Fast Switching Speed
- Low Input / Output Leakage

Dimensions SOT-23



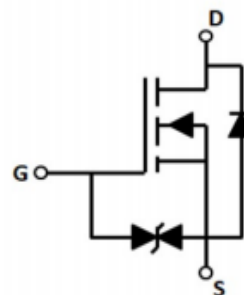
General Features

- V_{DS} 60V
- I_D 300mA
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<2.5\Omega$
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) $<3.0\Omega$
- ESD Protected Up to 2.0KV (HBM)

Application

- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS

Pin Configuration



Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
2N7002Q	72KC	SOT-23	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	60	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_A=25^\circ\text{C}$ @ Steady State	I_D	300	mA
	$T_A=70^\circ\text{C}$ @ Steady State		240	
Pulsed Drain Current ^A		I_{DM}	1.5	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$		P_D	300	mW
Thermal Resistance Junction-to-Ambient @ Steady State ^B		$R_{\theta JA}$	416	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V,V _{GS} =0V			1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V			± 10	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =300mA		1.9	2.5	Ω
		V _{GS} = 4.5V, I _D =200mA		2.0	3.0	
Diode Forward Voltage	V _{SD}	I _S =300mA,V _{GS} =0V			1.2	V
Maximum Body-Diode Continuous Current	I _S				300	mA
Dynamic Parameters						
Input Capacitance	C _{iSS}	V _{DS} =30V,V _{GS} =0V,f=1MHZ		27		pF
Output Capacitance	C _{oSS}			3		
Reverse Transfer Capacitance	C _{rSS}			2		
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V,V _{DS} =30V,I _D =0.3A		1.65	2.4	nC
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V,V _{DD} =30V, I _D =300mA, R _{GEN} =6Ω		6.5		ns
Turn-off Delay Time	t _{D(off)}			9.6		
Reverse recovery Time	t _{rr}	V _{GS} =0V,I _S =300mA,V _R =25V, di/dt=-100A/μs		24		ns

A. Pulse Test: Pulse Width ≤ 300μs, Duty cycle ≤ 2%.

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

Typical Characteristics

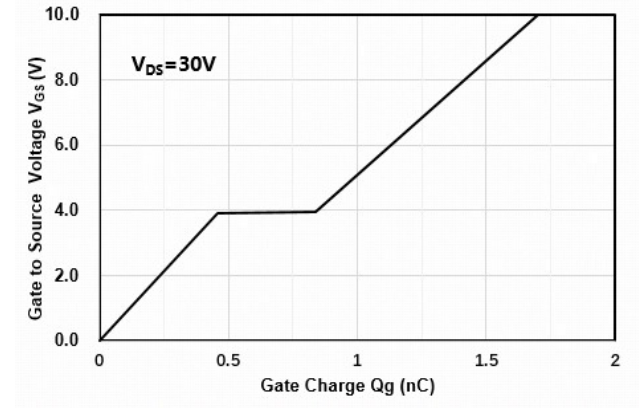
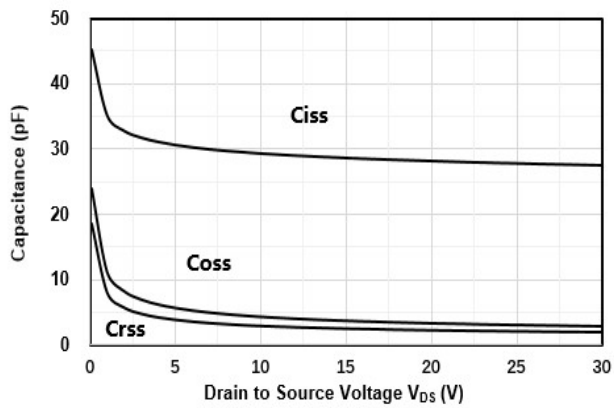
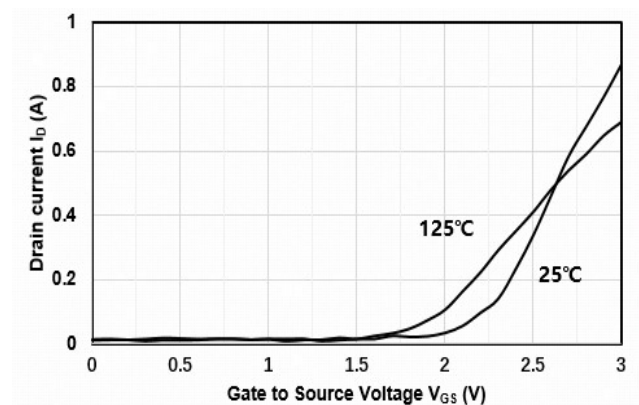
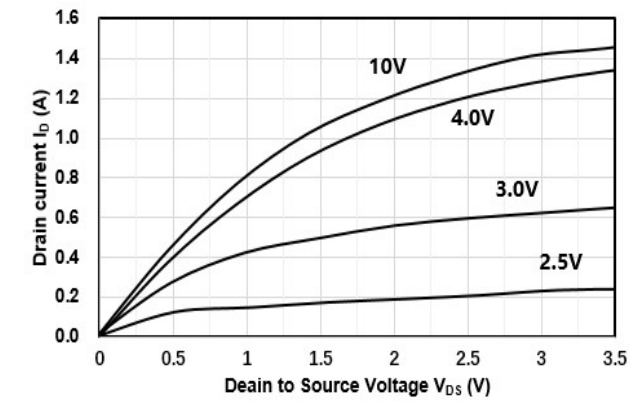


Figure3. Capacitance Characteristics

Figure4. Gate Charge

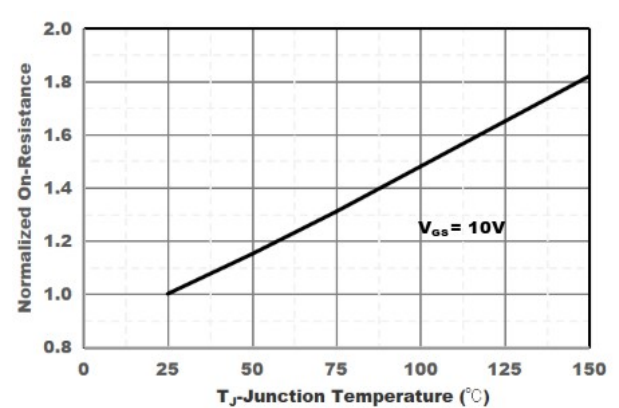
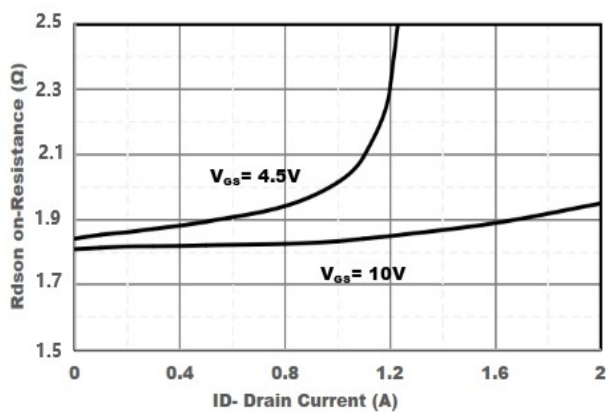
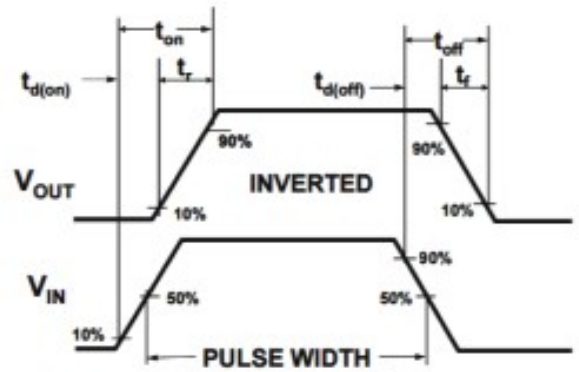
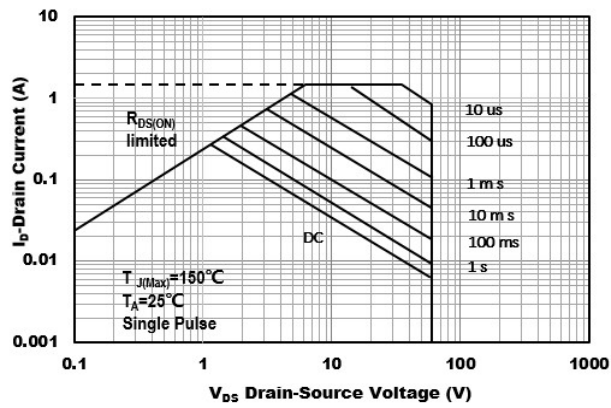
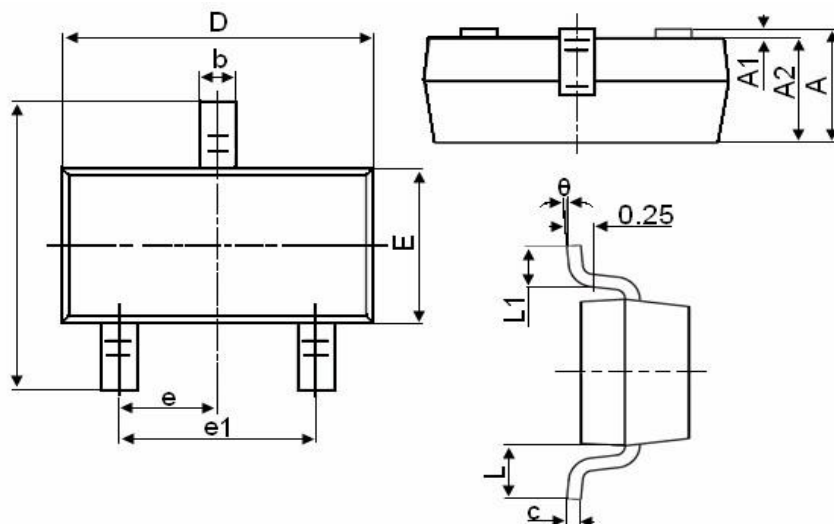


Figure5. Drain-Source on Resistance

Figure6. Drain-Source on Resistance



Package Mechanical Data:SOT-23



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°