

2N7002KL

60V N-Channel MOSFET

340mA 60V; $R_{DS(ON)typ}=1.9\Omega@10V$, $R_{DS(ON)typ}=2.3\Omega@4.5V$

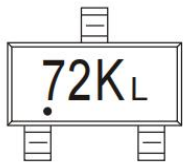
FEATURE

- High density cell design for Low RDS(on)
- Voltage controlled small signal switch
- Rugged and reliable
- ESD protected Gate HBM 2.5KV

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

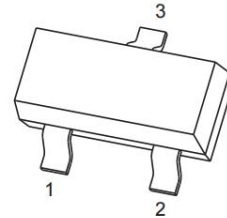
MARKING:



72KL=Device code

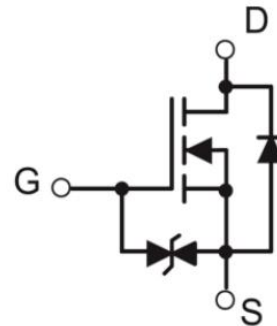
Solid dot = Green molding compound device, if none, the normal device.

SOT-23



1. GATE
2. SOURCE
3. DRAIN

Schematic diagram



ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	340	mA
Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~+150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25°C unless otherwise noted)

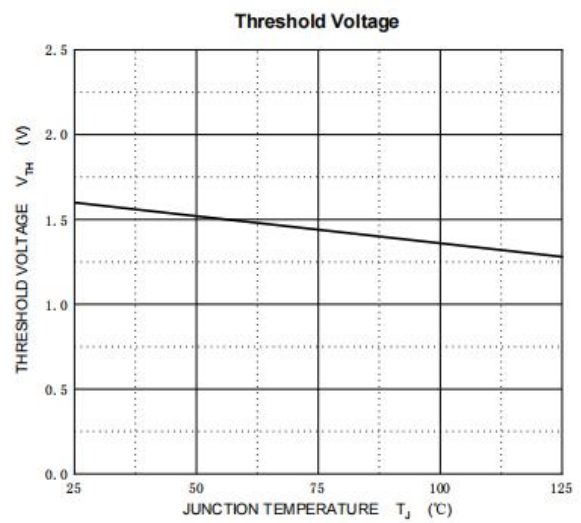
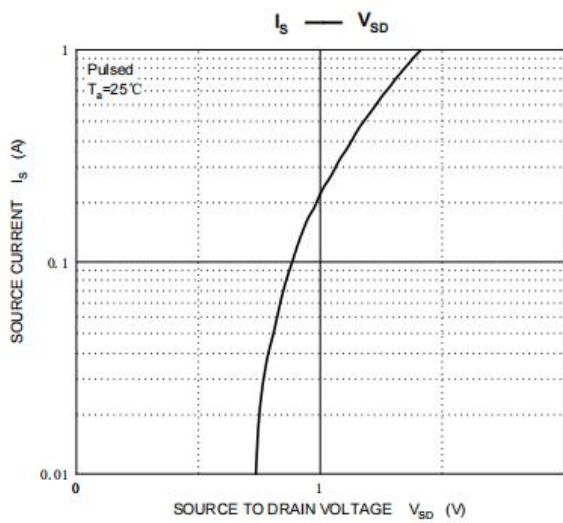
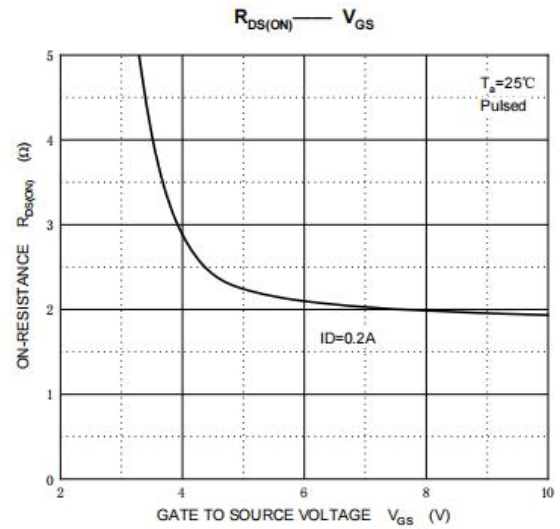
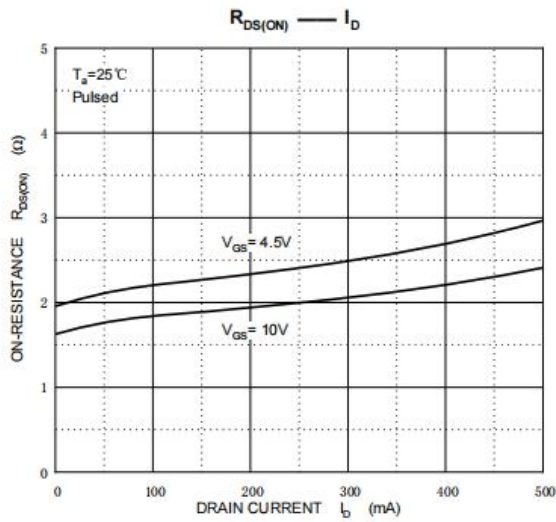
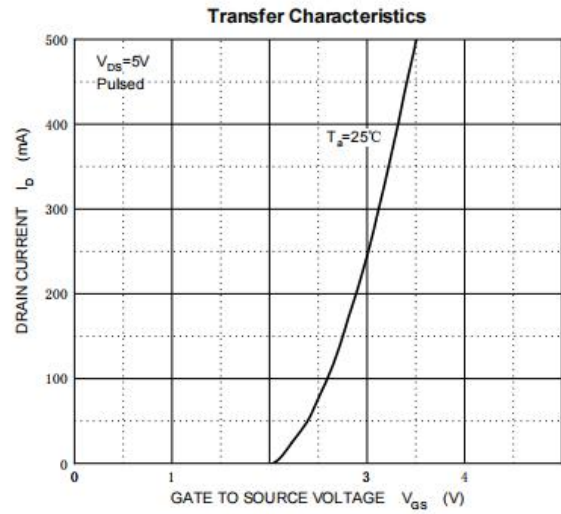
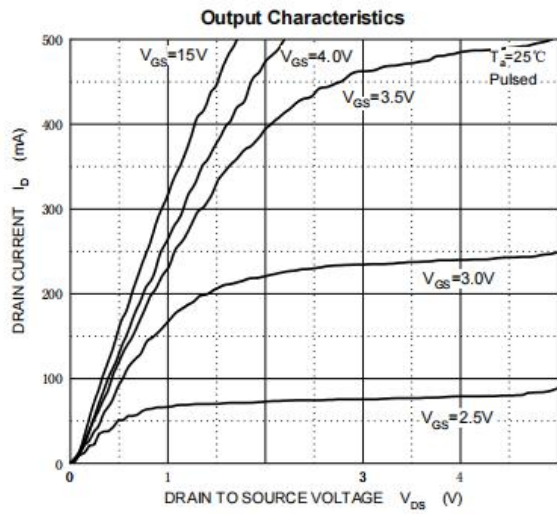
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 48V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS1}	V _{GS} = ±20V, V _{DS} = 0V			±10	μA
	I _{GSS2}	V _{GS} = ±10V, V _{DS} = 0V			±200	nA
	I _{GSS2}	V _{GS} = ±5V, V _{DS} = 0V			±100	nA
Gate threshold voltage*	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.6	2.5	V
Drain-source on-resistance*	R _{DS(on)}	V _{GS} = 10V, I _D = 500mA		1.9	2.5	Ω
		V _{GS} = 4.5V, I _D = 200mA		2.3	4	
Recovered charge	Q _r	V _{GS} = 0V, I _S = 300mA, V _R = 25V, dI _S /dt = -100A/μS		30		nC
Dynamic characteristics**						
Input Capacitance	C _{iss}	V _{DS} = 10V, V _{GS} = 0V, f = 1MHz			40	pF
Output Capacitance	C _{oss}				30	
Reverse Transfer Capacitance	C _{rss}				10	
Switching characteristics**						
Turn-on delay time	t _{d(on)}	V _{GS} = 10V, V _{DD} = 50V, R _G = 50Ω,			10	ns
Turn-off delay time	t _{d(off)}	R _{GS} = 50Ω, R _L = 250Ω			15	
Reverse recovery Time	t _{rr}	V _{GS} = 0V, I _S = 300mA, V _R = 25V, dI _S /dt = -100A/μS		30		
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	I _S = 300mA, V _{GS} = 0V			1.5	V
GATE-SOURCE ZENER DIODE						
Gate-Source Breakdown Voltage	BV _{GSO}	I _{GS} = ±1mA (Open Drain)	±21.5		±30	V

Notes:

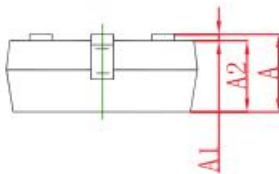
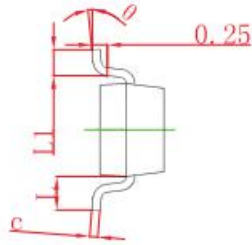
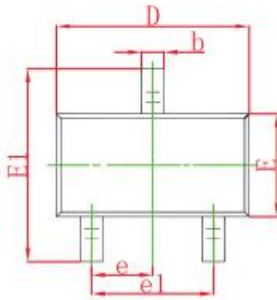
*Pulse Test: Pulse Width ≤ 300μs' Duty Cycle ≤ 2%.

**These parameters have no way to verify.

Typical Electrical and Thermal Characteristics



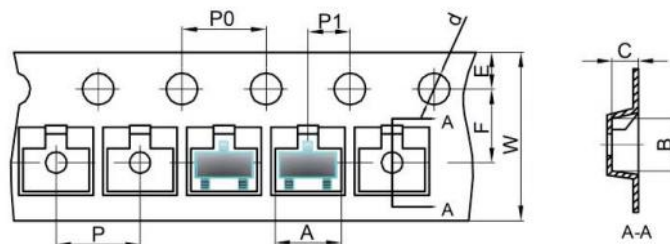
SOT-23 Package Information



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°

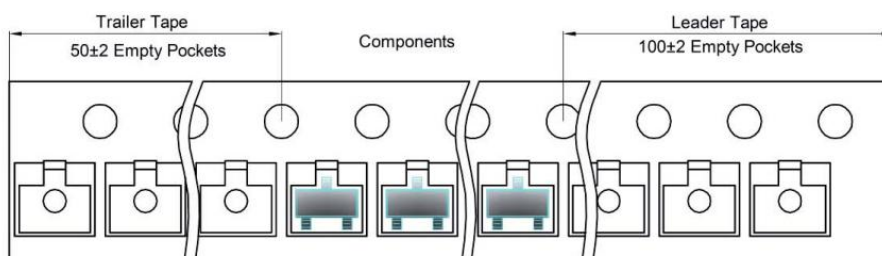
SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

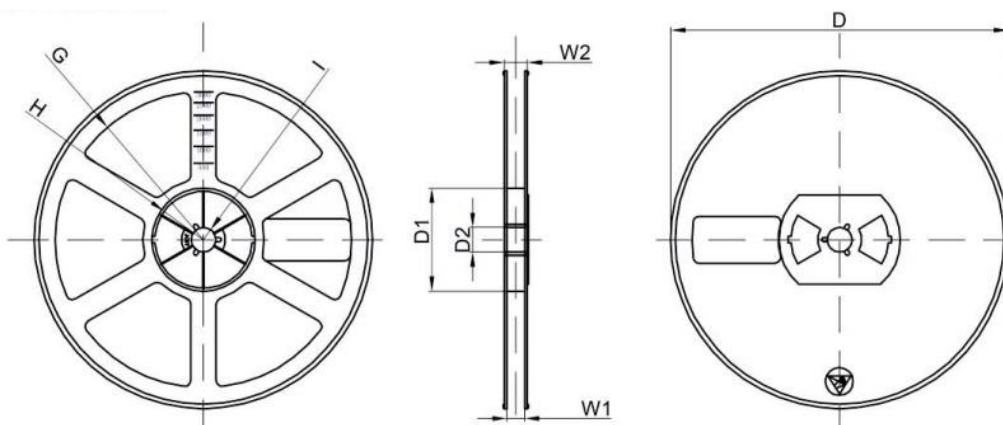


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	