

Enhancement Mode N-Channel Power MOSFET

PRIMARY CHARACTERISTICS

BV _{DSS}	R _{DS(ON)} MAX	I _D
60V	3 Ω @V _{GS} =10V	500mA
	4 Ω @V _{GS} =4.5V	

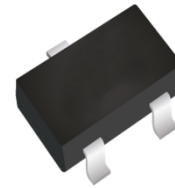
Features

- V_{DS}=60V, I_D=500mA
- R_{DS(ON)} < 3 Ω @V_{GS}=10V, R_{DS(ON)} < 4 Ω @V_{GS}=4.5V
- High Power and Current Handling Capability
- Lead Free Product
- Surface Mount Package
- ESD Rating: >2000V HBM

Mechanical Data

- SOT-23 Small Outline Plastic Package
- Epoxy UL: 94V-0
- Mounting Position: Any

SOT-23



Applications

- PWM Applications
- Load Switch
- Power Management

Ordering Information

Orderable Part Number	Package Type	Device Marking	Form	Quantity (pcs)
2N7002KS	SOT-23	7002	7" Tape&Reel	3,000

Maximum Ratings (@ T_A = 25°C, unless otherwise specified.)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V _{DS}	60	V
Gate - Source Voltage	V _{GS}	±20	V
Continuous Drain Current (V _{GS} = 4.5V) ⁽¹⁾	I _D	0.5	A
Pulsed Drain Current ⁽²⁾	I _{DM}	1.2	A
Power Dissipation	P _D	0.35	W
Junction & Storage Temperature Range	T _J , T _{STG}	-55 ~ +150	°C

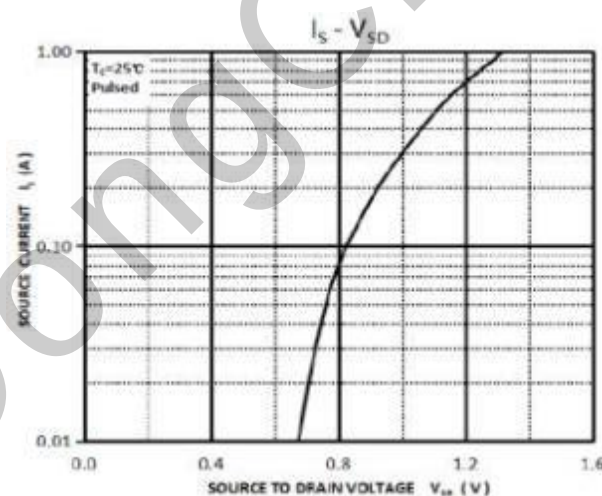
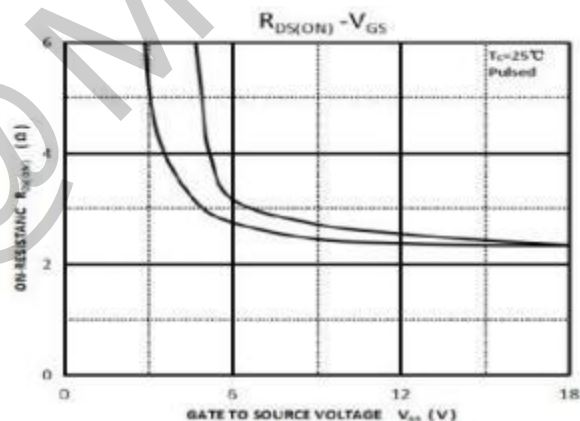
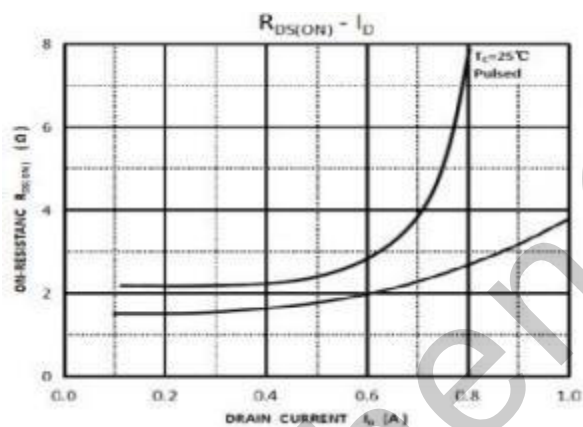
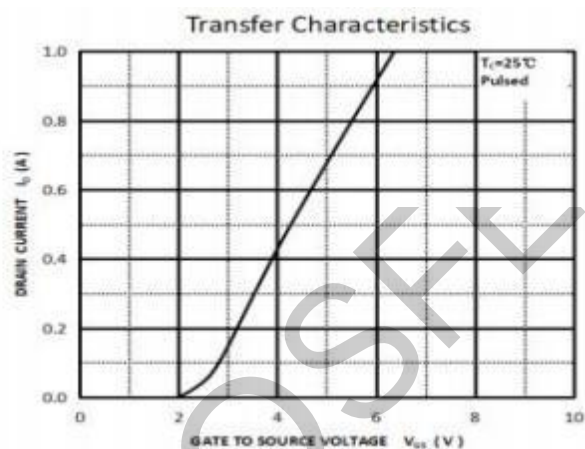
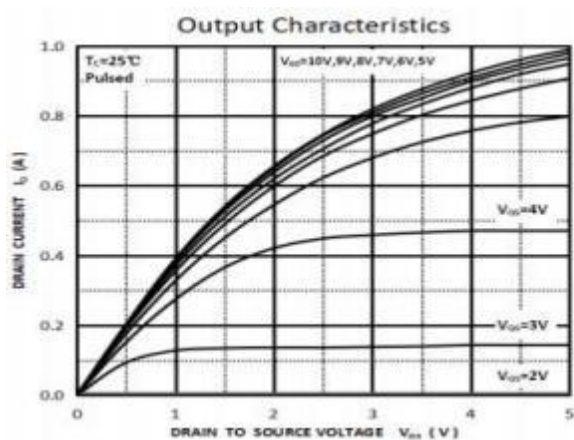
Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient ⁽³⁾	R _{θJA}	357	-	°C/W

Electrical Characteristics (@ $T_J = 25^\circ\text{C}$, unless otherwise specified.)

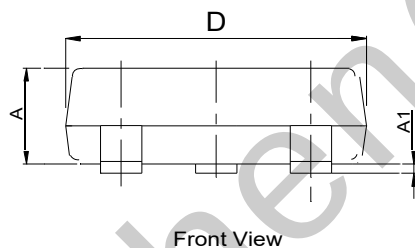
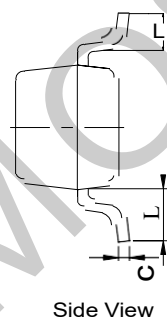
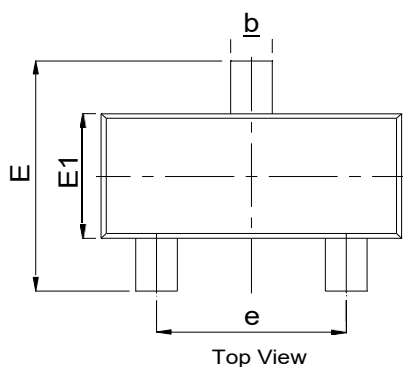
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics ⁽⁴⁾						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	VGS=0V, ID=250μA	60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	VDS=48V, VGS = 0V,TJ=25°C	-	-	1	μA
Gate-Source Leakage Current	I _{GSS}	VGS=±20V, VDS = 0V	-	-	±10	μA
On Characteristics ⁽⁴⁾						
Gate Threshold Voltage	V _{GS(th)}	VDS=VGS, , ID=1mA	0.8	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	VGS=4.5V, ID=0.2A	-	2.4	4	Ω
		VGS=10V, ID=0.5A	-	1.9	3	Ω
Diodes Forward Voltage	V _{SD}	IS=0.3A, VGS=0V	-	-	1.5	V
Dynamic Characteristics ⁽⁴⁾						
Input Capacitance	C _{iss}	VDS=10V, VGS=0V, f=1MHz	-	-	40	pF
Output Capacitance	C _{oss}		-	-	30	pF
Reverse Transfer Capacitance	C _{rss}		-	-	10	pF
Switching Characteristics ⁽⁵⁾						
Turn-On DelayTime	t _{d(on)}	VGS=10V, VDD=50V, , RG=50Ω, RL=250Ω	-	-	10	ns
Turn-Off DelayTime	t _{d(off)}		-	-	15	ns
Gate Charge Characteristics ⁽⁵⁾						
Drain-Source Diode Characteristics ⁽⁵⁾						
Notes:						
1. This current is chip limited, which is calculated based on Rthja.						
2. This current is calculated on single pulse with 10μs Single Pulse .						
3. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.						
4. Short duration pulse test used to minimize self-heating effect.						
5. Defined by design, not subject to production.						

Typical Electrical and Thermal Characteristics



Outline Drawing

SOT-23

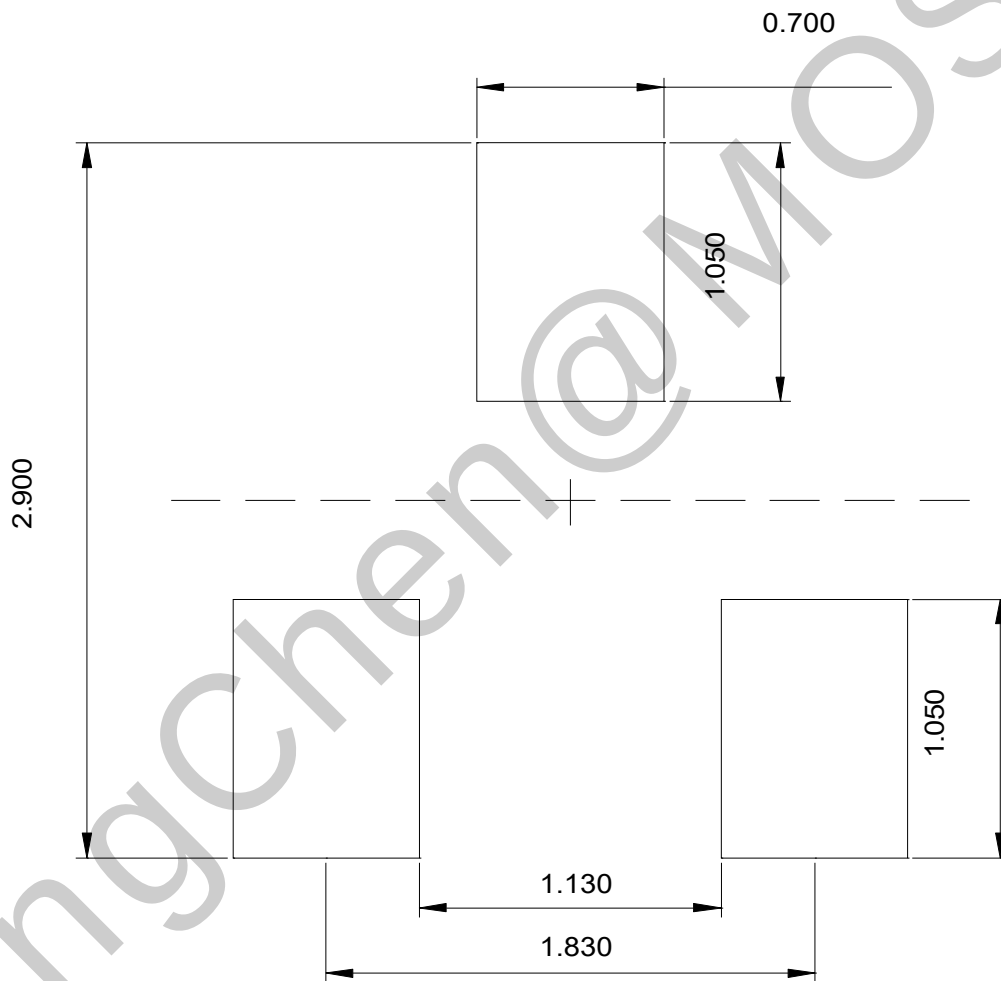


DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0.00	-	0.10
D	2.80	2.90	3.00
E	2.30	2.40	2.50
E1	1.20	1.30	1.40
L	0.45	0.55	0.65
L1	0.20	-	0.55
b	0.30	0.40	0.50
c	-	0.10	0.15
e	-	1.90	-

Dimensions in inches and (millimeters)

Suggested Soldering Pad Layout

SOT-23



Dimensions in inches and (millimeters)

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