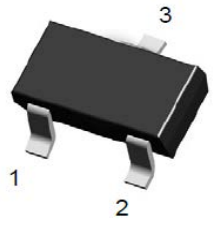
N-Channel High Density Trench MOSFET (60V,0.5A)

PRODUCT SUMMARY

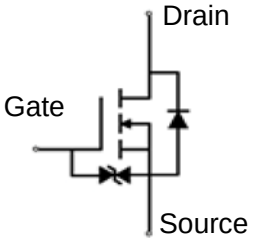
V_{DSS}	I_D	$R_{DS(on)}$ (mΩ)Typ.
60V	500mA	2.5 @ VGS = 10V, ID=0.5A
		3.0 @ VGS = 4.5V, ID=0.2A

Features

- High speed switch
- Advanced Trench Process Technology
- SOT-23 package
- ESD protected up to 2KV
- Lead（Pb）-free and halogen-free



EN2N7002K Pin Assignment & Symbol
3-Lead Plastic SOT-23
Pin 1: Gate Pin 2: Source Pin3: Drain



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current (Continuous)	0.5	A
I_{DM}	Drain Current (Pulsed) [a]	0.8	A
P_D	Total Power Dissipation @T_A=25°C	0.3	W
I_S	Maximum Diode Forward Current	0.5	A
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	°C
R_{QJA}	Thermal Resistance Junction to Ambient (PCB mounted)[b]	357	°C/W

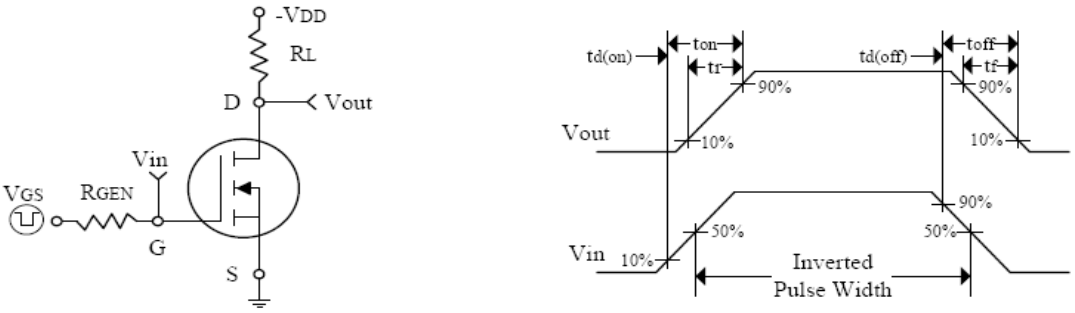
a: Repetitive Rating: Pulse width limited by the maximum junction temperature.

b: 1-in^2 2oz Cu PCB board

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

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=48V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±15V, V_{DS}=0V	-	-	±10	mA
• On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1.0	-	2.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=0.5A	-	2.5	3.5	mΩ
		V_{GS}=4.5V, I_D=0.2A	-	3.0	4.0	
• Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	-	60	PF
C_{oss}	Output Capacitance		-	-	30	
C_{rss}	Reverse Transfer Capacitance		-	-	10	
• Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=15V, R_L=23Ω, I_D=0.5A, VGEN=10V, RG=25Ω	-	-	15	nS
$t_{d(off)}$	Turn-off Delay Time		-	-	15	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward	V_{GS}=0V, I_S=1.7A	-	-	1.2	V

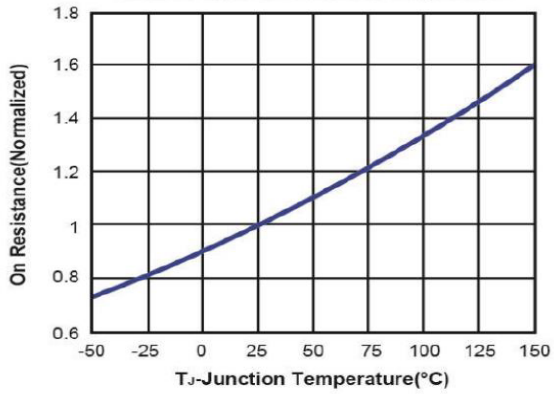
Note: Pulse Test: Pulse Width≤300us, Duty Cycle≤2%



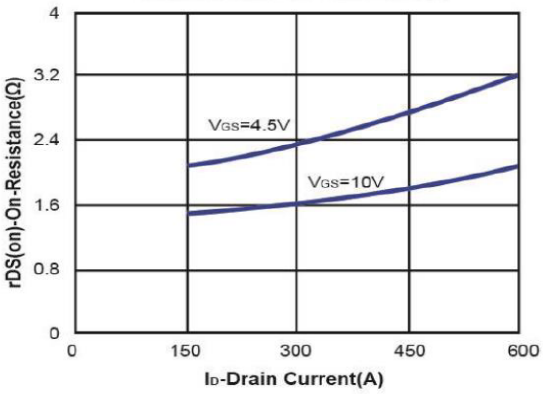
Switching Test Circuit and Switching Waveforms

Typical Characteristics Curves (Ta=25°C, unless otherwise note)

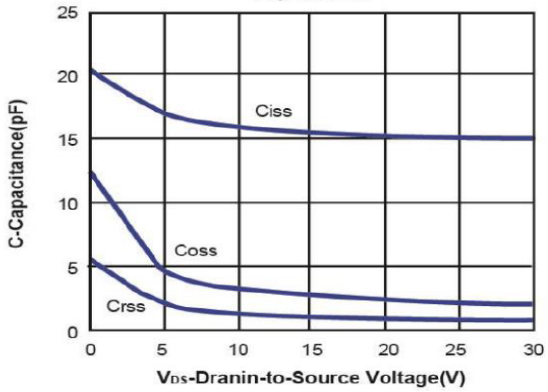
On Resistance vs. Junction Temperature



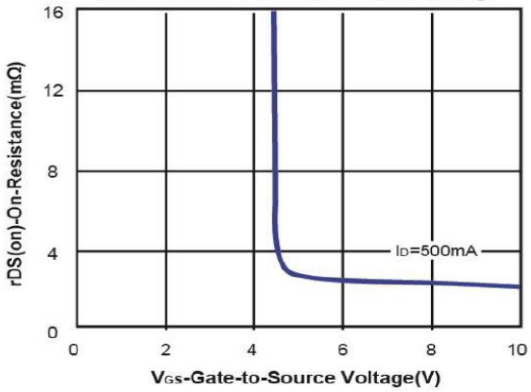
On Resistance vs. Drain Current



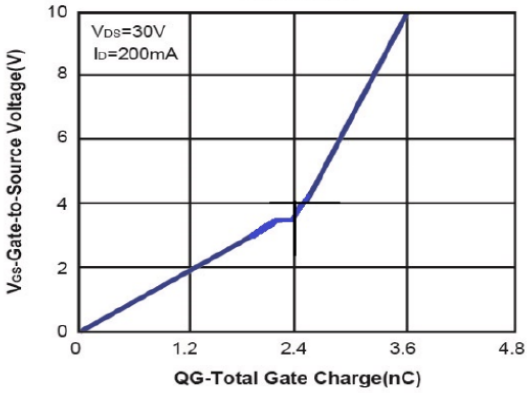
Capacitance



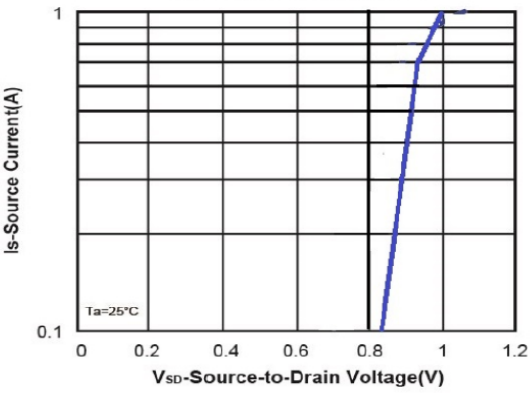
On Resistance vs. Gate-to-Source Voltage



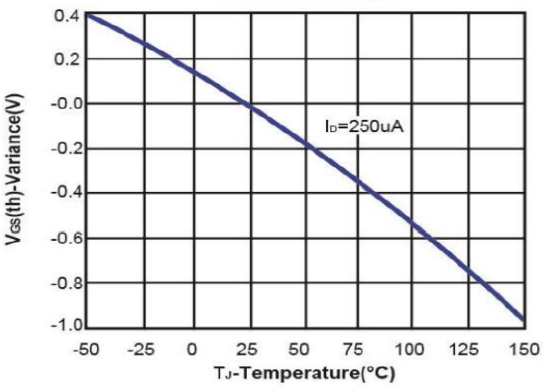
Gate Charge



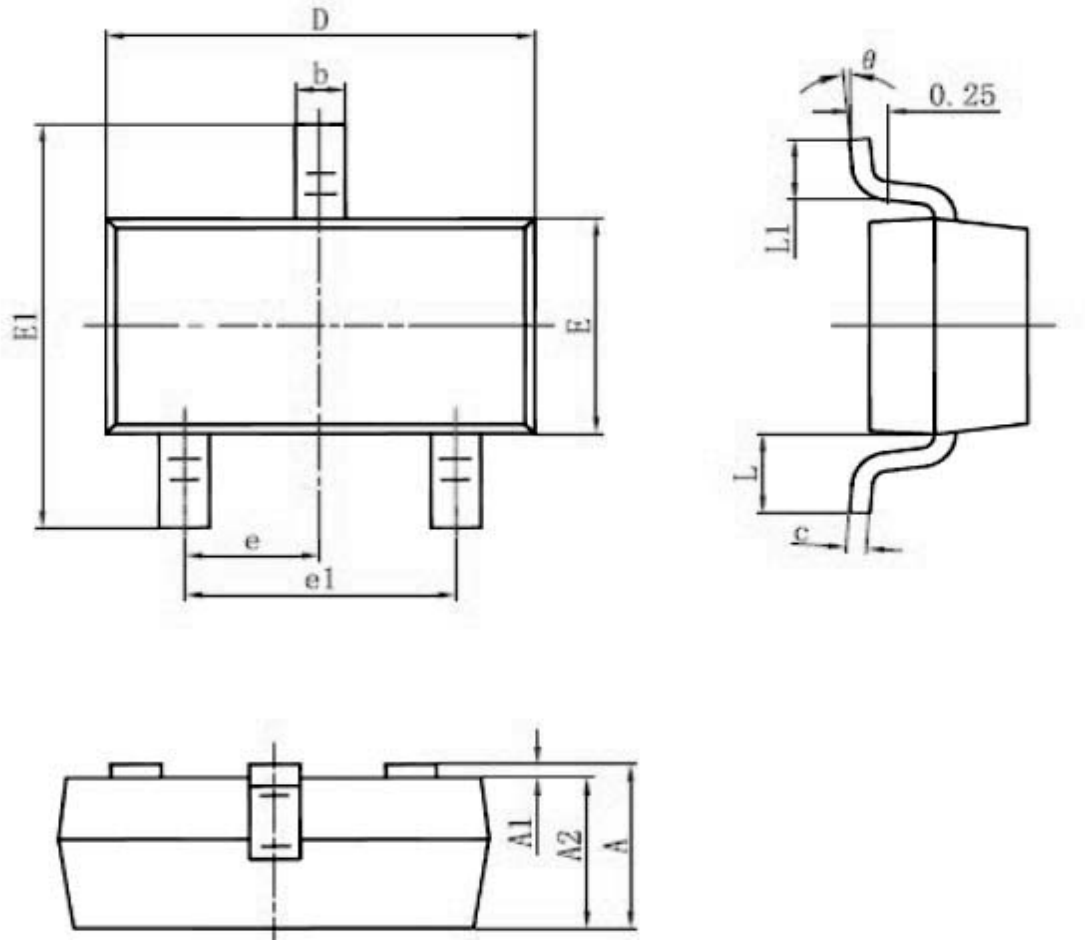
Body-diode characteristics



Threshold Voltage



SOT-23L 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°