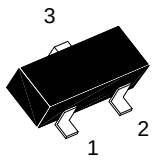
N-Channel High Density Trench MOSFET (30V, 4.8A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
30V	4.8A	30 @ V_{GS} = 10V
		35 @ V_{GS} = 4.5V
		42 @ V_{GS} = 2.5V

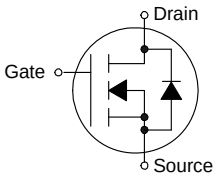
Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Rugged and reliable.

KF3022A Pin Assignment & Symbol



3-Lead Plastic **SOT-23/SOT-23L**
Pin 1: Gate 2: Source 3: Drain



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

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current [A]	T_A=25°C	I_D	4.8	A
Pulsed Drain Current [B]		I_{DM}	30	
Power Dissipation [A]	T_A=25°C	P_D	1.4	W
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics					
Parameter		**Symbol**	**Typ**	**Max**	**Units**
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	65	90	°C/W
Maximum Junction-to-Ambient [A]	Steady-State		85	125	°C/W
Maximum Junction-to-Lead [C]	Steady-State	$R_{\theta JL}$	43	60	°C/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=250μA, V_{GS}=0V	30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=25V, V_{GS}=0V			1	μA
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±12V			100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=250μA	0.6			v
$I_{D(ON)}$	On state drain current	V_{GS}=4.5V, V_{DS}=5V	30			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=4.8A		26	30	mΩ
		V_{GS}=4.5V, I_D=4A		30	35	mΩ
		V_{GS}=2.5V, I_D=3.5A		38	42	mΩ
g_{FS}	Forward Transconductance	V_{DS}=5V, I_D=4.8A	10	15		S
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V		0.71	1.2	V
I_S	Maximum Body-Diode Continuous Current				2.5	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, f=1MHz		823	1030	pF
C_{oss}	Output Capacitance			99		pF
C_{rss}	Reverse Transfer Capacitance			77		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz		1.2	3.6	Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=4.5V, V_{DS}=15V, I_D=5.8A		9.7	12	nC
Q_{gs}	Gate Source Charge			1.6		nC
Q_{gd}	Gate Drain Charge			3.1		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=15V, R_L=2.7Ω, R_{GEN}=3Ω		3.3	5	ns
t_r	Turn-On Rise Time			4.8	7	ns
$t_{D(off)}$	Turn-Off DelayTime			26.3	40	ns
t_f	Turn-Off Fall Time			4.1	6	ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=5A, dI/dt=100A/μs		16	20	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=5A, dI/dt=100A/μs		8.9	12	nC

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design. The current rating is based on the ≦ 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to lead $R_{\theta JL}$ and lead to ambient.

D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80μs pulses, duty cycle 0.5% max.

E. These tests are performed with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

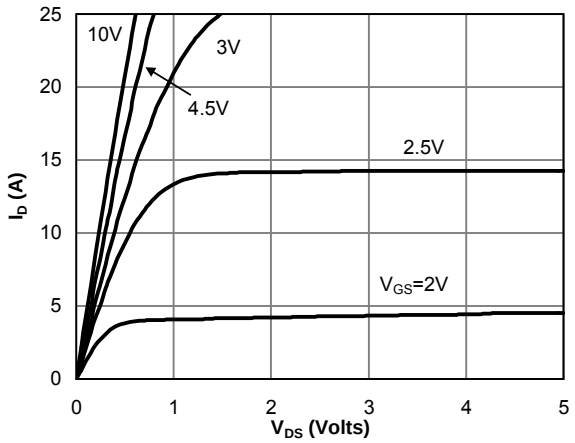


Fig 1: On-Region Characteristics

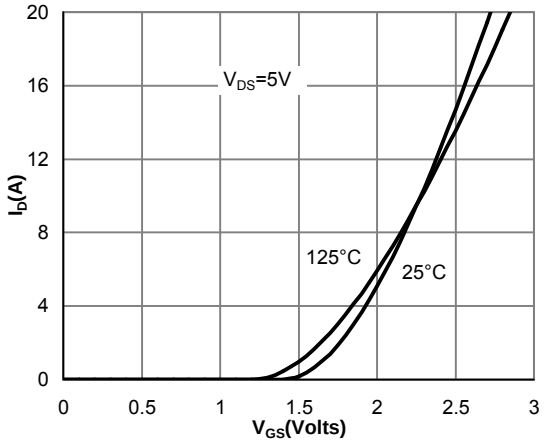


Figure 2: Transfer Characteristics

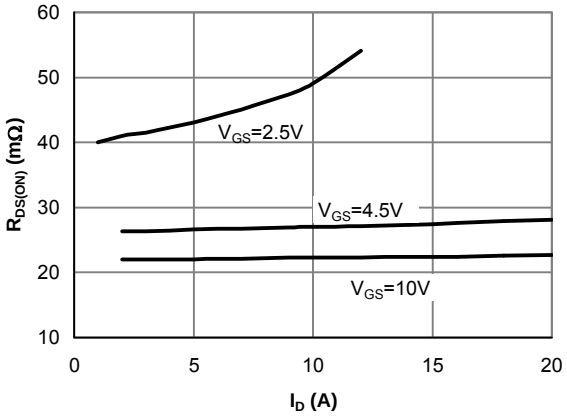


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

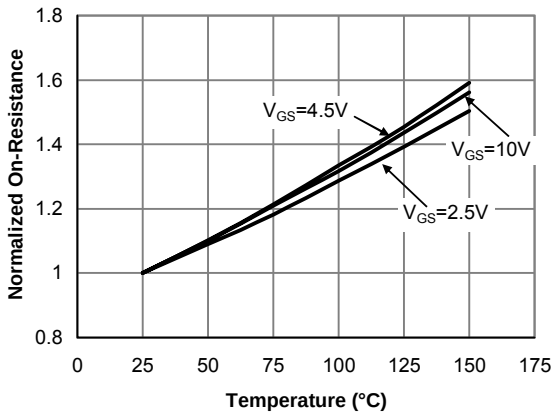


Figure 4: On-Resistance vs. Junction Temperature

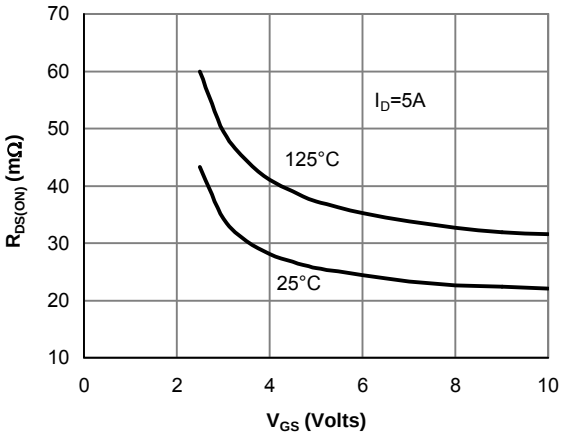


Figure 5: On-Resistance vs. Gate-Source Voltage

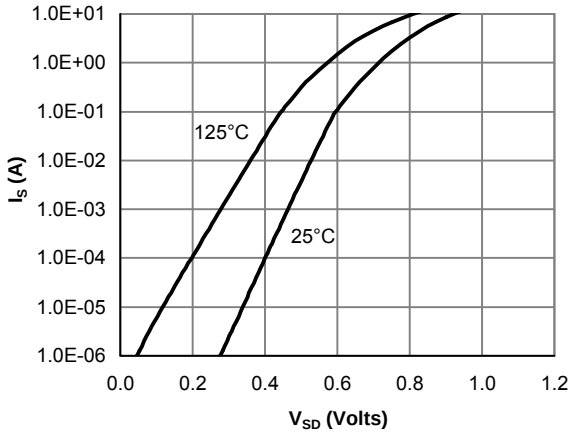


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

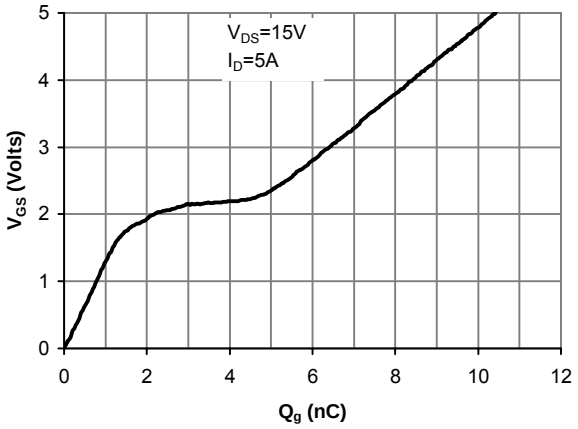


Figure 7: Gate-Charge Characteristics

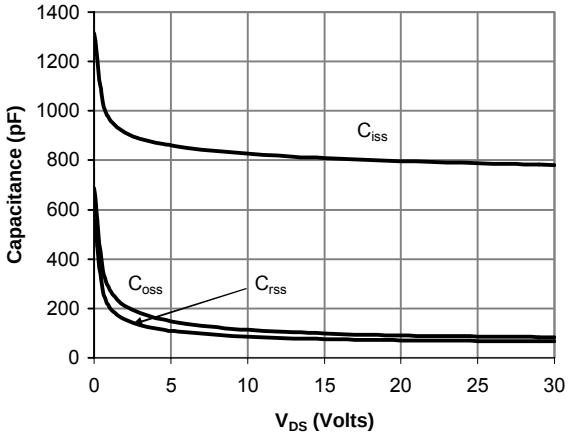


Figure 8: Capacitance Characteristics

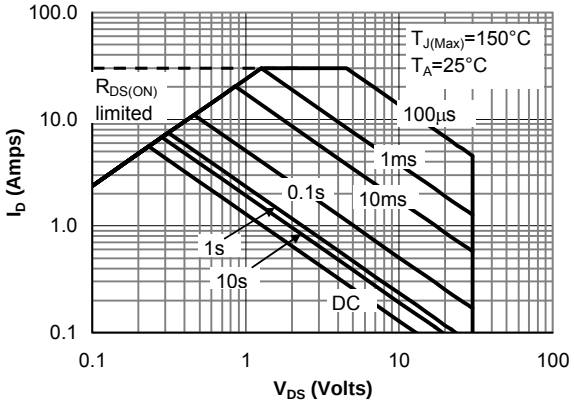


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

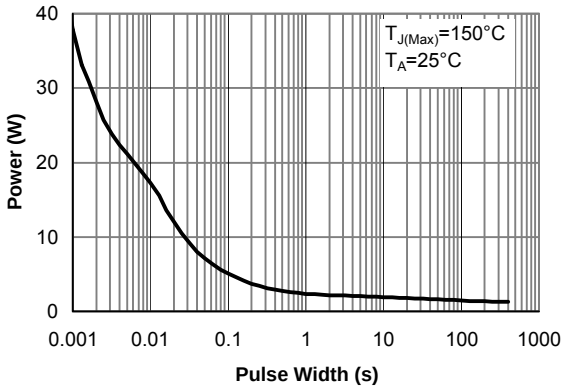


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

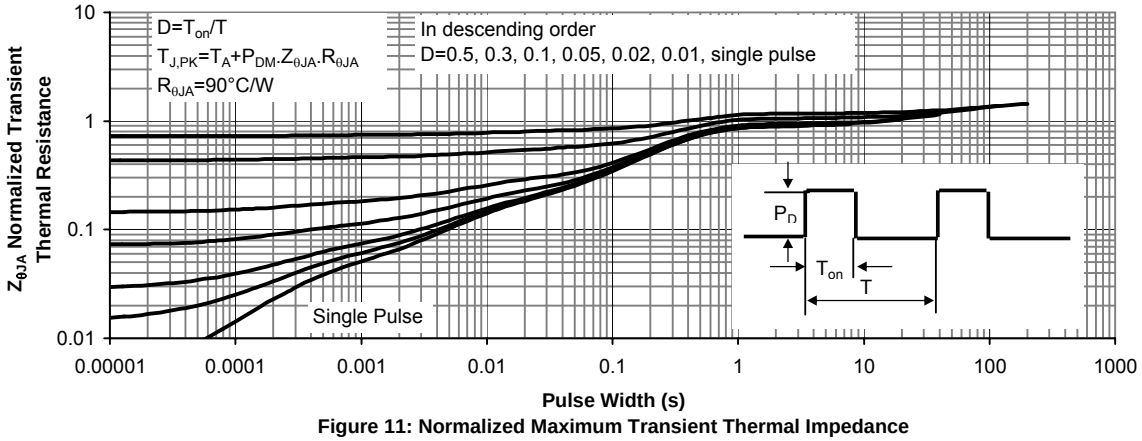
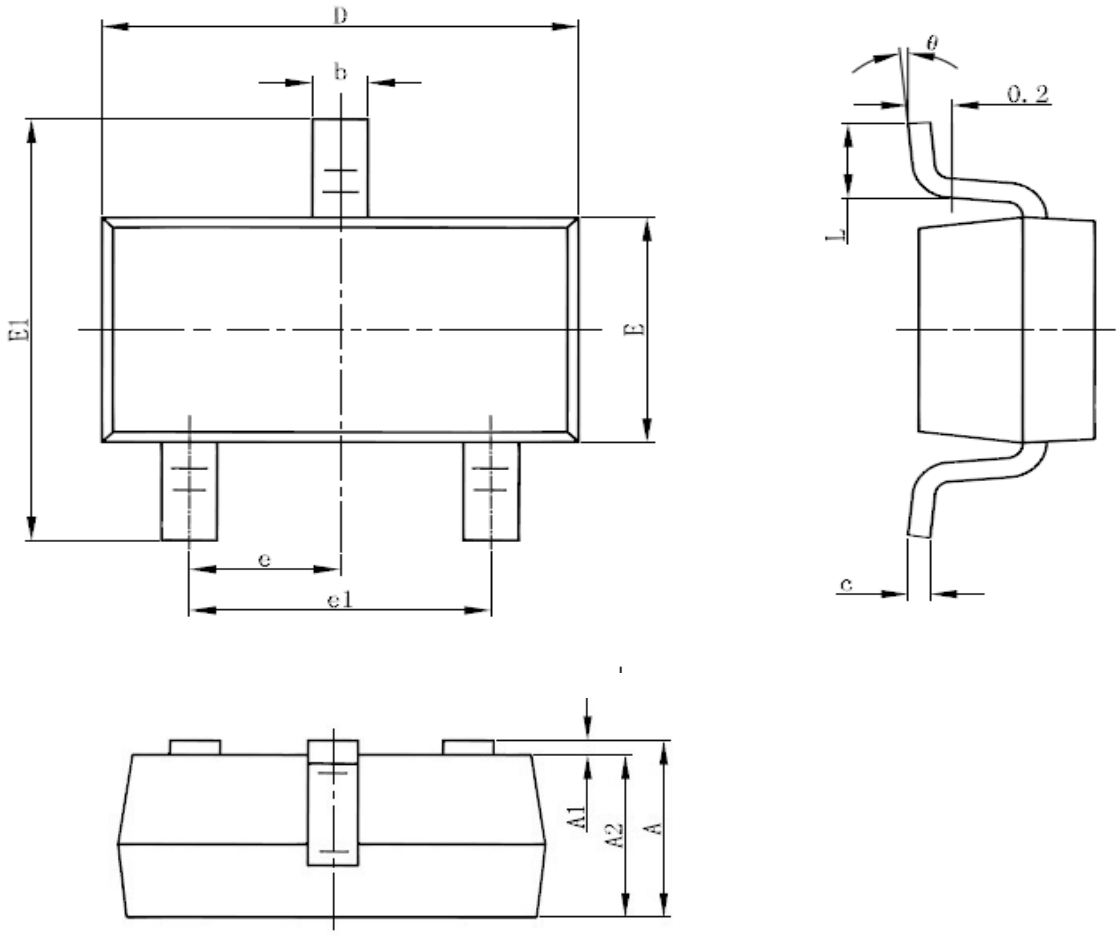


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Dimensions:



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.850	1.250	0.033	0.049
A1	0.000	0.100	0.000	0.004
A2	0.7	1.150	0.028	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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