

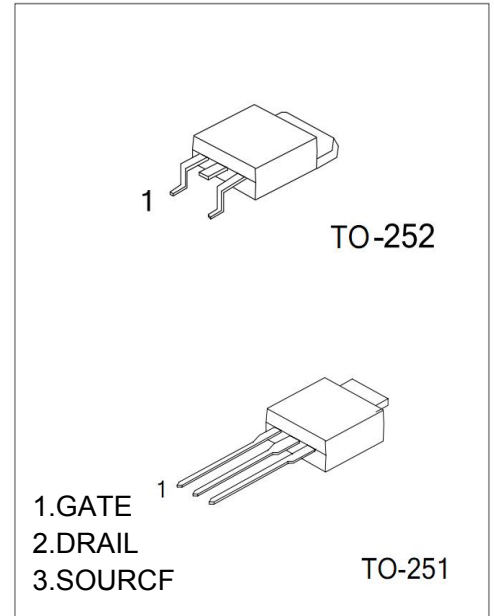


## MK4003N

## N-Channel 30-V(D-S) Power MOSFET

V(BR)DSS	RDS(on)MAX	ID
30 V	14mΩ@ 10 V	40A
	18mΩ@ 4.5 V	

### Equivalent Circuit:



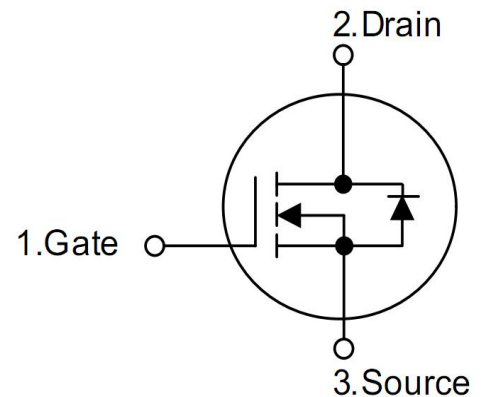
### General Description:

The high voltage MOSFET uses an advanced termination scheme to provide enhanced voltage-blocking capability without degrading performance over time. In addition, this advanced MOSFET is designed to withstand high energy in avalanche and commutation modes. The new energy efficient design also offers a drain-to-source diode with a fast recovery time. Designed for high voltage, high speed switching applications in power suppliers, converters and PWM motor controls, these devices are particularly well suited for bridge circuits where diode speed and commutating safe operating areas are critical and offer additional and safety margin against unexpected voltage transients.

### FEATURE:

- ※ Power switching application
- ※ Hard switched and high frequency circuits
- ※ Uninterruptible power supply
- ※ Fully characterized avalanche voltage and current
- ※ Excellent package for good heat dissipation
- ※ Good stability and uniformity with high EAS

### SYMBOL:



### Maximum ratings ( Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	VDS	30	V
Gate-Source Voltage	VGS	±20	
Continuous Drain Current	ID	40	A
Pulsed Diode Current	IDM	170	
Power Dissipation	PD	50	W
Thermal Resistance from Junction to Ambient (t≤10s)	RθJA	100	°C/W
Operating Junction	TJ	150	°C
Storage Temperature	TSTG	-55~+150	



MOSFET ELECTRICAL CHARACTERISTICS

Static Electrical Characteristics (Ta = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-source breakdown voltage	<b>V(BR)DSS</b>	VGS = 0V, ID = 250μA	30			V
Gate-source threshold voltage	<b>VGS(th)</b>	VDS =VGS, ID = 250μA	1		2.5	V
Gate-source leakage	<b>IGSS</b>	VDS =0V, VGS = ±20V			±100	μA
Zero gate voltage drain current	<b>IDSS</b>	VDS = 30V, VGS =0V			1	μA
Drain-source on-state resistancea	<b>RDS(on)</b>	VGS = 10V, ID = 20A		10	14	mΩ
		VGS = 4.5V, ID = 20A		13	18	mΩ
Forward transconductancea	<b>gfs</b>	VDS = 25V, ID = 20A		28		S
Diode forward voltage	<b>VSD</b>	IS= 30A, VGS=0V		0.8	1.3	V
<b>Dynamic</b>						
Input capacitance	<b>Ciss</b>	VDS = 25V,VGS =0V, f=1MHz		800		pF
Output capacitance	<b>Coss</b>			380		pF
Reverse transfer capacitanceb	<b>Crss</b>			133		pF
Total gate charge	<b>Qg</b>	VDS = 25V,VGS = 10V, ID = 20A		17		nC
Gate-source charge	<b>Qgs</b>			3		nC
Gate-drain charge	<b>Qgd</b>			10		nC
<b>Switchingb</b>						
Turn-on delay time	<b>td(on)</b>	VDD= 25V RL= 1Ω, ID = 20A, VGEN= 10V,Rg= 3.3Ω		8		ns
Rise time	<b>tr</b>			60		ns
Turn-off delay time	<b>td(off)</b>			23		ns
Fall time	<b>tf</b>			10		ns
<b>Drain-Source Diode Characteristics</b>						
Continuous Source-Drain Diode Current	<b>IS</b>				40	A
Pulsed Diode forward Curren	<b>ISM</b>				170	A

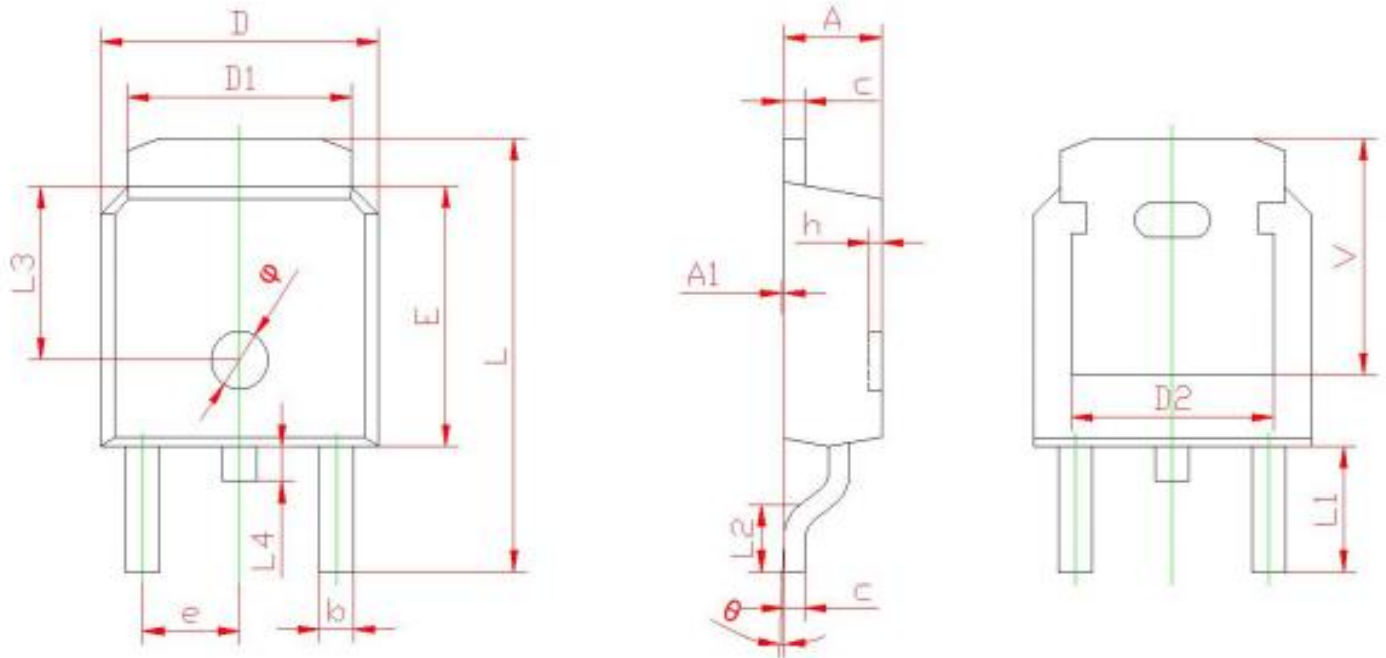
**Note :**

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.



PACKAGE OUTLINE DIMENSIONS :

**TO-252 PACKAGE OUTLINE DIMENSIONS**

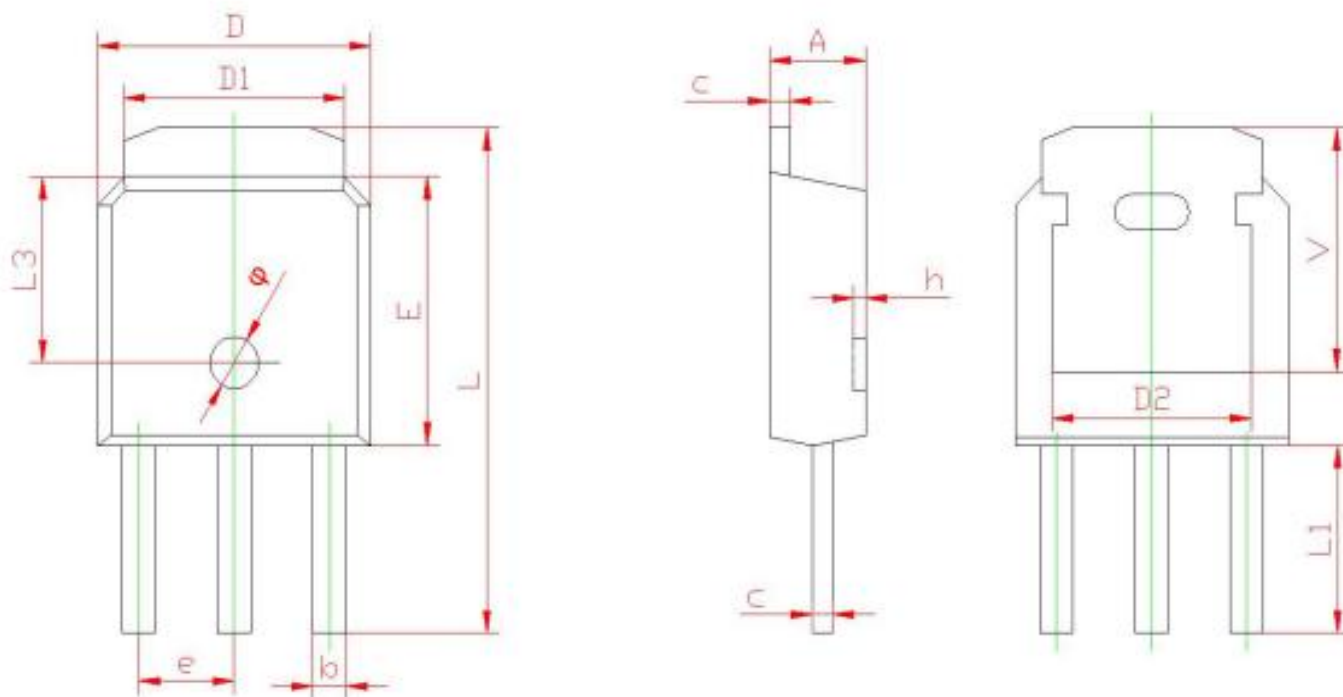


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	<b>2.400</b>	0.087	0.094
A1	0.000	<b>0.127</b>	0.000	0.005
b	0.660	<b>0.860</b>	0.026	0.034
c	0.460	<b>0.580</b>	0.018	0.023
D	6.500	<b>6.700</b>	0.256	0.264
D1	5.100	<b>5.460</b>	0.201	0.215
D2	4.800 REF		0.189 REF	
E	6.000	<b>6.200</b>	0.236	0.244
e	2.186	<b>2.386</b>	0.086	0.094
L	9.800	<b>10.400</b>	0.386	0.409
L1	2.900 REF		0.114 REF	
L2	1.400	<b>1.700</b>	0.055	0.067
L3	4.00 REF		0.157 REF	
L4	0.600	<b>1.000</b>	0.024	0.039
φ	<b>1.200</b>	<b>1.400</b>	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	<b>0.300</b>	0.000	0.012
V	5.500 REF		0.217 REF	



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D	6.500	<b>6.700</b>	0.256	0.264
D1	5.100	<b>5.460</b>	0.201	0.215
D2	4.800 REF		0.189 REF	
E	6.000	<b>6.200</b>	0.236	0.244
e	2.186	<b>2.386</b>	0.086	0.094
L	9.800	<b>10.400</b>	0.386	0.409
L1	4.300 REF		0.170 REF	
L3	4.00 REF		0.16 REF	
L4	0.600	<b>1.000</b>	0.024	0.039
h	0.000	<b>0.300</b>	0.000	0.012
V	5.500 REF		0.217 REF	