

## MSK1N3

### N-Channel 20-V Logic Level Enhancement Mode MOSFET

#### Features

- Low on-resistance
- High ESD
- High speed switching
- Low-voltage drive (4V)
- Easily designed drive circuits
- Easy to use in parallel
- RoHS compliant package

**Package type** : SOT-23

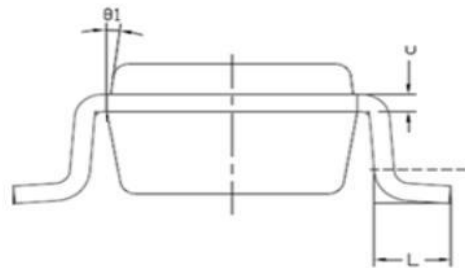
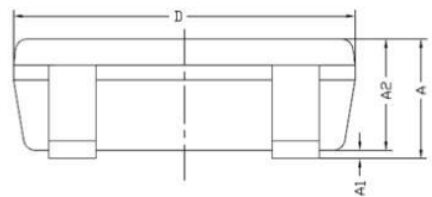
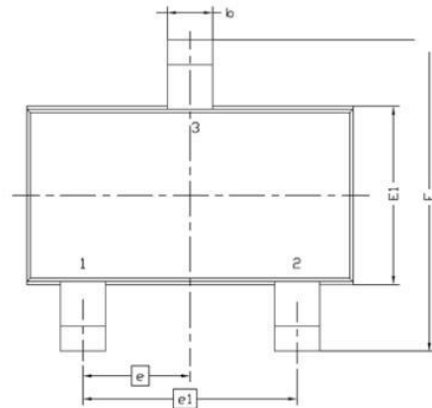
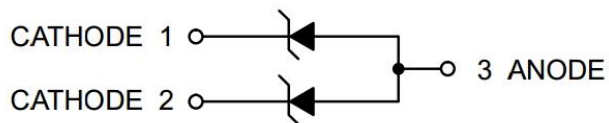
#### Packing & Order Information

3,000/Reel



**RoHS  
COMPLIANT**

Graphic symbol



Symbol	MILLIMETERS	
	MIN	MAX
A	0.8	1.2
A1	0	0.1
A2	0.7	1.1
b	0.3	0.5
c	0.1	0.2
D	2.7	3.1
E	2.6	3
E1	1.4	1.8
e	0.95 BSC	
e1	1.9 BSC	
L	0.3	0.6
θ1	7° NOM	

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#### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

##### Absolute Maximum Ratings (Ta=25°C)

Symbol	Parameter	Value	Unit
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±8	V
I <sub>D</sub>	Drain Current -Continuous (T <sub>A</sub> =25°C)	6	A
	Drain Current -Continuous (T <sub>A</sub> =70°C)	3.6	A
I <sub>DM</sub>	Pulsed Drain Current	22	A
P <sub>D</sub>	Total Power Dissipation (T <sub>A</sub> =25°C)	0.83	W
	Total Power Dissipation (T <sub>A</sub> =70°C)	0.3	W
I <sub>S</sub>	Continuous Source Current (Diode Conduction) <sup>a</sup>	1	A
T <sub>J</sub> ,T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C

##### Thermal Data

Symbol	Parameter	Max.	Units
R <sub>θJA</sub>	Maximum Junction-to- Ambient <sup>a</sup> ( t<=10 sec )	110	°C/W
R <sub>θJA</sub>	Maximum Junction-to- Ambient <sup>a</sup> ( Steady State )	150	

Note:

1. Surface Mounted on 1"x1" FR4 Board.
2. Pulse width limited by maximum junction temperature.

#### Electrical Characteristics

##### Static

Symbol	Test Conditions	Min	Typ.	Max.	Units
V <sub>SD</sub>	V <sub>GS</sub> = 0 V , I <sub>S</sub> = 1 A	--	0.7	--	V
V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	20	--	--	V
I <sub>DSS</sub>	V <sub>DS</sub> = 24 V , V <sub>GS</sub> = 0 V	--	--	1	μA
	V <sub>DS</sub> = 20 V , V <sub>GS</sub> = 0 V , T <sub>J</sub> = 125°C	--	--	30	
I <sub>GSS</sub>	V <sub>GS</sub> = ±8 V , V <sub>DS</sub> = 0	--	--	±10	nA
I <sub>D(ON)</sub>	V <sub>DS</sub> = 5 V , V <sub>GS</sub> = 4.5 V	10	--	--	A
R <sub>DS(ON)*1</sub>	V <sub>GS</sub> = 2.5 V , I <sub>D</sub> = 5 A	--	--	20	mΩ
	V <sub>GS</sub> = 4.5 V , I <sub>D</sub> = 6 A	--	--	28	
G <sub>FS*1</sub>	V <sub>DS</sub> = 15 V , I <sub>D</sub> = 6 A		10		S

##### Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> = 10 V , V <sub>GS</sub> = 0 V , f = 1.0MHz	--	680	--	pF
C <sub>OSS</sub>	Output Capacitance		--	144	--	pF
C <sub>rSS</sub>	Reverse Transfer Capacitance		--	137	--	pF

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Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$Q_g$	Total Gate Charge	$V_{DS} = 10\text{ V}$ , $I_D = 6\text{ A}$ , $V_{GS} = 4.5\text{ V}$	--	13.5	--	nC
$Q_{gs}$	Gate-Source Charge		--	0.9	--	nC
$Q_{gd}$	Gate-Drain Charge		--	5.4	--	nC
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 10\text{ V}$ , $I_D = 1\text{ A}$ , $V_{GEN} = 4.5\text{ V}$ , $R_{GEN} = 6\Omega$ $R_L = 10\Omega$	--	6	--	ns
$t_r$	Rise Time		--	12	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	65	--	ns
$t_f$	Fall Time		--	35	--	ns

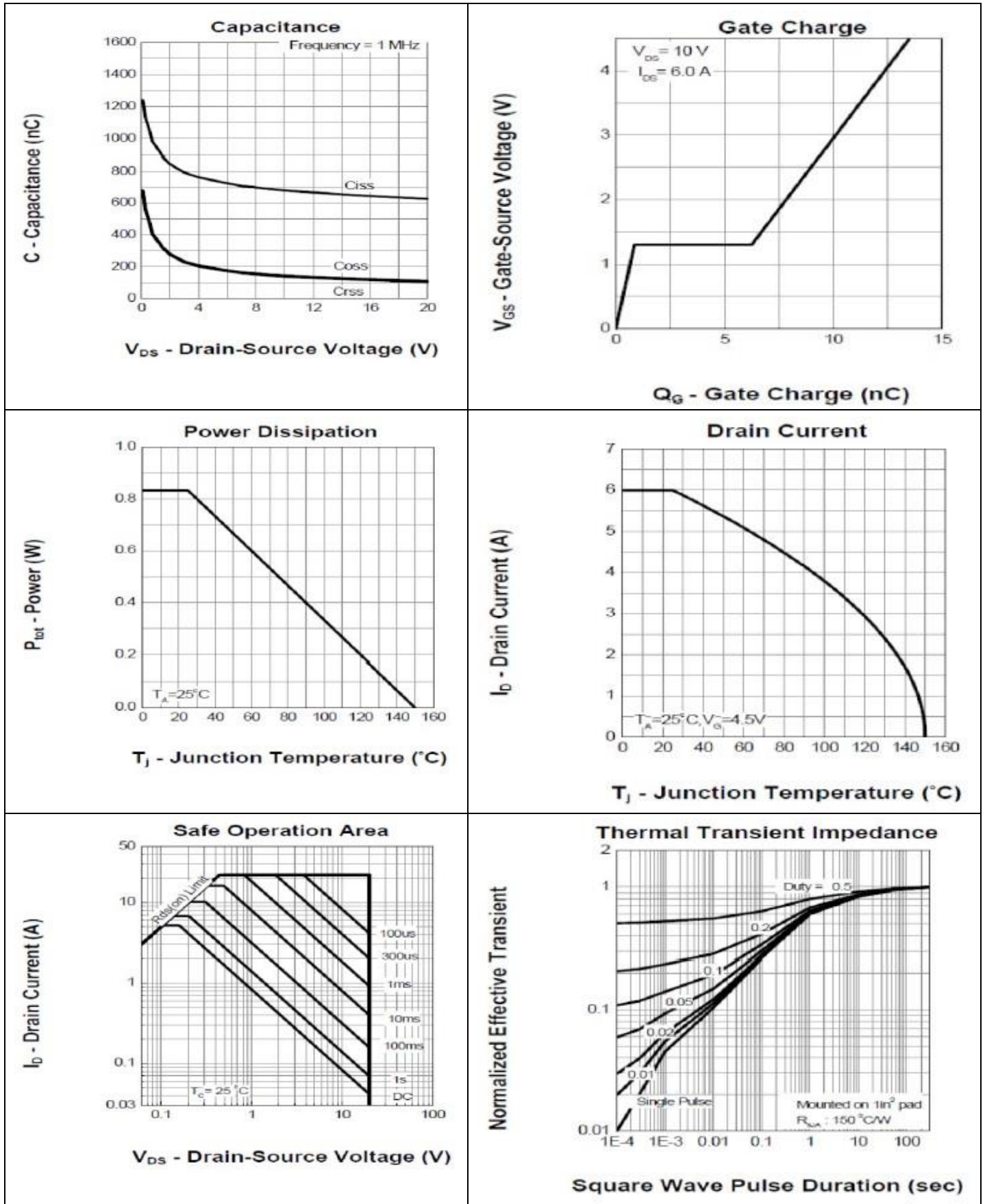
#### Notes

- Pulse test:  $PW \leq 300\mu s$  duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.

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### N-Channel 20-V Logic Level Enhancement Mode MOSFET

#### ■ Characteristics Curves



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### N-Channel 20-VLogic Level Enhancement Mode MOSFET

#### Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

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