山东晶导微电子股份有限公司
Jingdao Microelectronics co.LTD

NM3404BWK

5A , 30V N-CHANNEL MOSFET

Features

- $R_{DS(ON)}$ ≤ 27mΩ @ V_{GS}=10V,I_D=4A

- $R_{DS(ON)}$ ≤ 35mΩ @ V_{GS}=4.5,I_D=3A

- High Speed Switching

- High Density Cell Design For Low $R_{DS(ON)}$

- Trench Power LV MOSFET Technology

- Halongen Free."Green" Device(Note1)

Applications

- Load Switch
- PWM Application
- Power Management

Simplified outline SOT-223 and symbol
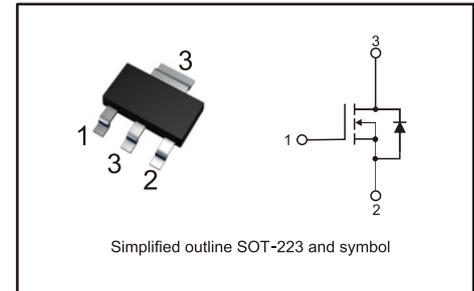
MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	Ta=25°C	I_D	5	A
	Ta=100°C		3.2	A
Pulsed Drain Current(Note2)		I_{DM}	20	A
Power Dissipation	Ta=25°C	P_D	1.25	W
Thermal Resistance-Junction to Ambient(Note3)	Ta=25°C	$R_{\theta JA}$	100	°C/W
Avalanche energy, single pulse(Note4)		EAS	9	mJ
Operating Junction Temperature		T_j	-55 to +150	°C
Storage Temperature		T_{stg}	-55 to +150	°C

1.Halongfen free "GREEN"products are defined ai those which contain <900ppm bromine, <900ppm chlorine
 (<1500ppm total Br+Cl) and <1000ppm antimony compounds.
2. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.
3. Device mounted on FR-4 PCB, 1 inch^2,t≤10sec.
4. EAS condition: Starting TJ=25°C, VDD=30V, VGS=10V, RG=25Ω，L=0.5mH, IAS=6A.

Electrical Characteristics (TA=25°C, unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250uA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V			1	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±0.1	uA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250uA	1	1.5	2.5	V
Static Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 4A		21	27	mΩ
		V_{GS} = 4.5V, I_D = 3A		27	35	
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS} = 15V		388		pF
Output Capacitance	C_{OSS}	V_{GS} = 0V		57		
Reverse Transfer Capacitance	C_{RSS}	f =1MHz		45		
Total Gate Charge	Q_g	V_{DS} = 15V		9		nC
Gate-Source Charge	Q_{gs}	V_{GS} =0 to 10V		1.5		
Gate-Drain Charge	Q_{gd}	I_D = 3A		2		
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=15V,		2		ns
Turn-On Rise Time	t_{rr}	R_{GEN}=3Ω,		6		
Turn-Off Delay Time	$t_{d(off)}$	V_{GS}=10V,		61		
Turn-Off Fall Time	t_f	I_D=3A,		34		
Body Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	I_S = 5A, V_{GS} = 0V			1.2	V
Diode Forward Current	I_S				5	A
Reverse Recovery Charge	t_{rr}	dI_{SD}/dt=100A/μs		6		nS
Reverse Recovery Time	Q_{rr}	I_{SD}=3A		2		nC

TYPICAL CHARACTERICS

Fig 1. Output characteristics

V_{GS} = 10V
V_{GS} = 4.5V
V_{GS} = 3.5V
V_{GS} = 3.0V

I_D (A)
V_{DS} (V)
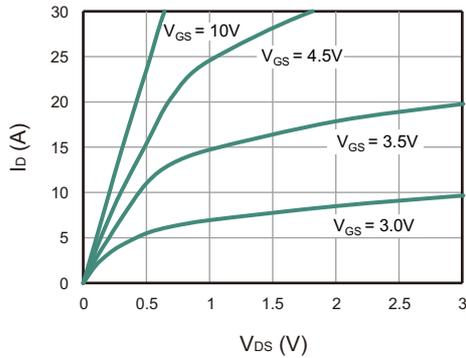
Fig 2. Typical Transfer characteristics

V_{DS} = 5V
T_J = 125°C
T_J = -55°C
T_J = 25°C

I_D (A)
V_{GS} (V)
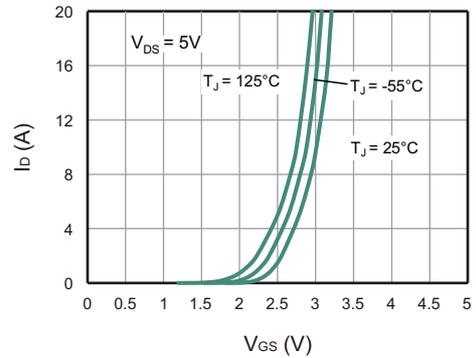
Fig 3. On-resistance vs. Drain Current

V_{GS} = 4.5V
V_{GS} = 10V

$R_{DS(ON)}$ (mΩ)
I_D (A)

Fig 4. Body Diode Characteristics

V_{GS} = 0V
T_J = 125°C
T_J = -55°C
T_J = 25°C

I_S (A)
V_{SD} (V)
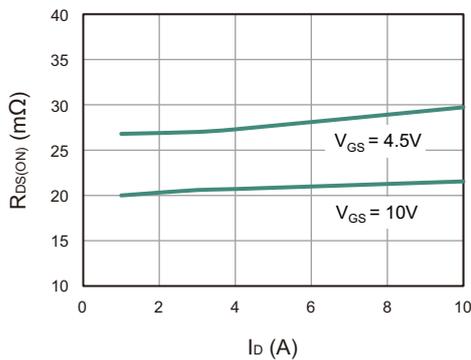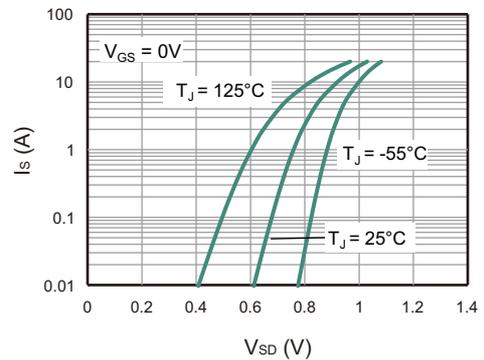
Fig 5. Gate Charge Characteristics

V_{DD} = 15V
I_D = 3A

V_{GS} (V)
Q_g (nC)
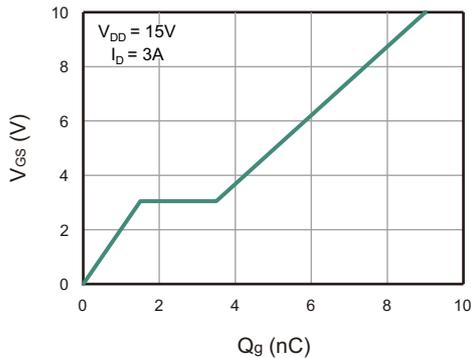
Fig 6. Capacitance Characteristics

C_{iss}
C_{oss}
C_{rss}
f = 1MHZ
V_{GS} = 0V

Capacitance(pF)
V_{ds} Drain Source Voltage(V)
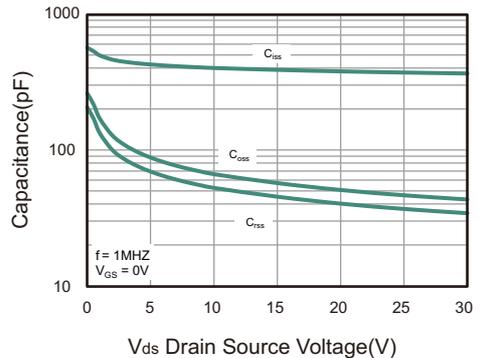
Fig 7. Normalized Breakdown voltage vs.T_J

I_D = 1mA

Normalized $V_{(BR)DSS}$
T_J (°C) Junction Temperature
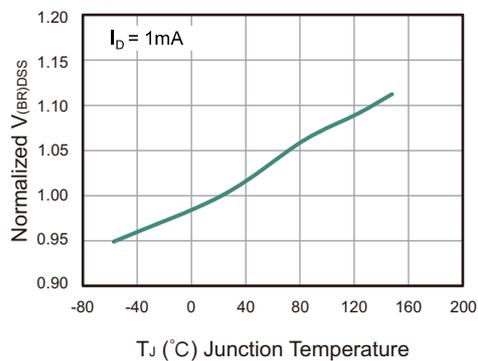
Fig 8. Normalized on Resistance vs. T_J

V_{GS} = 10V
I_D = 4A

Normalized $R_{DS(ON)}$
T_J (°C) Junction Temperature
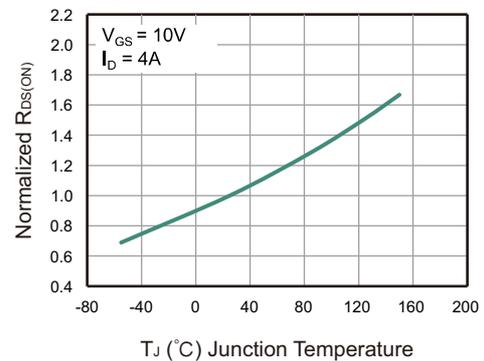
TYPICAL CHARACTERICS

## Fig 9. Maximum Safe Operating Area
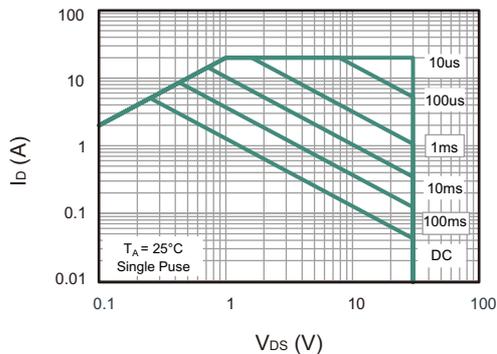
Fig 10. Maximum Continuous Drain Currenr vs. Ambient Temperature
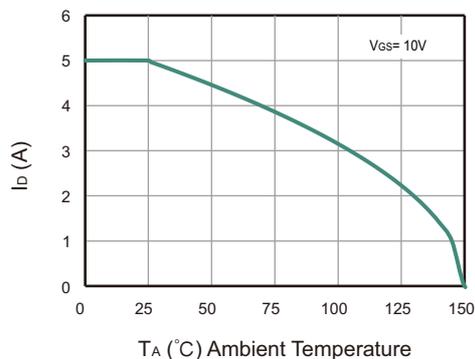


## Fig 11. Normalized Maximum Transient Thermal Impedance
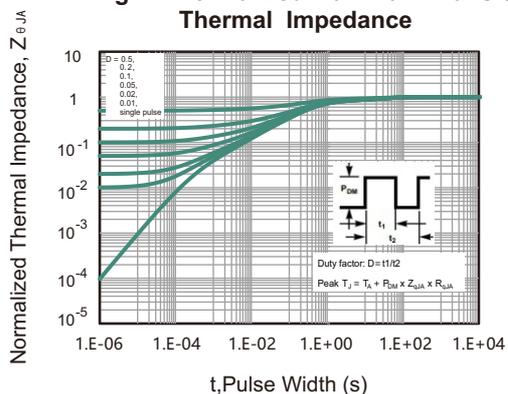

Fig 12. Peak Current Capacity
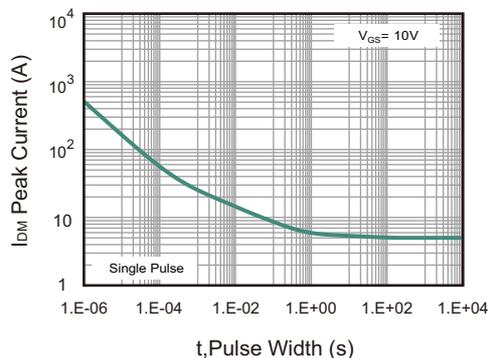
SOT-223 Package Outline Dimensions

SOT-223 mechanical data

UNIT		A	B	C	D	d1	d2	e1	e2	HE	L	a	L1	ALL
mm	MAX	1.65	3.7	0.254	6.6	2.3	4.6	3.1	0.84	7.20	1.750	0.1	/	11~13°
	MIN	1.55	3.3	REF	6.4	BSC	BSC	2.9	0.66	6.80	REF	0	0.75	
mil	MAX	64.96	145.67	10.00	259.84	90.55	181.10	122.05	33.07	283.46	68.90	3.94	/	
	MIN	61.02	129.92	REF	251.97	BSC	BSC	114.17	25.98	267.72	REF	0.00	29.53	
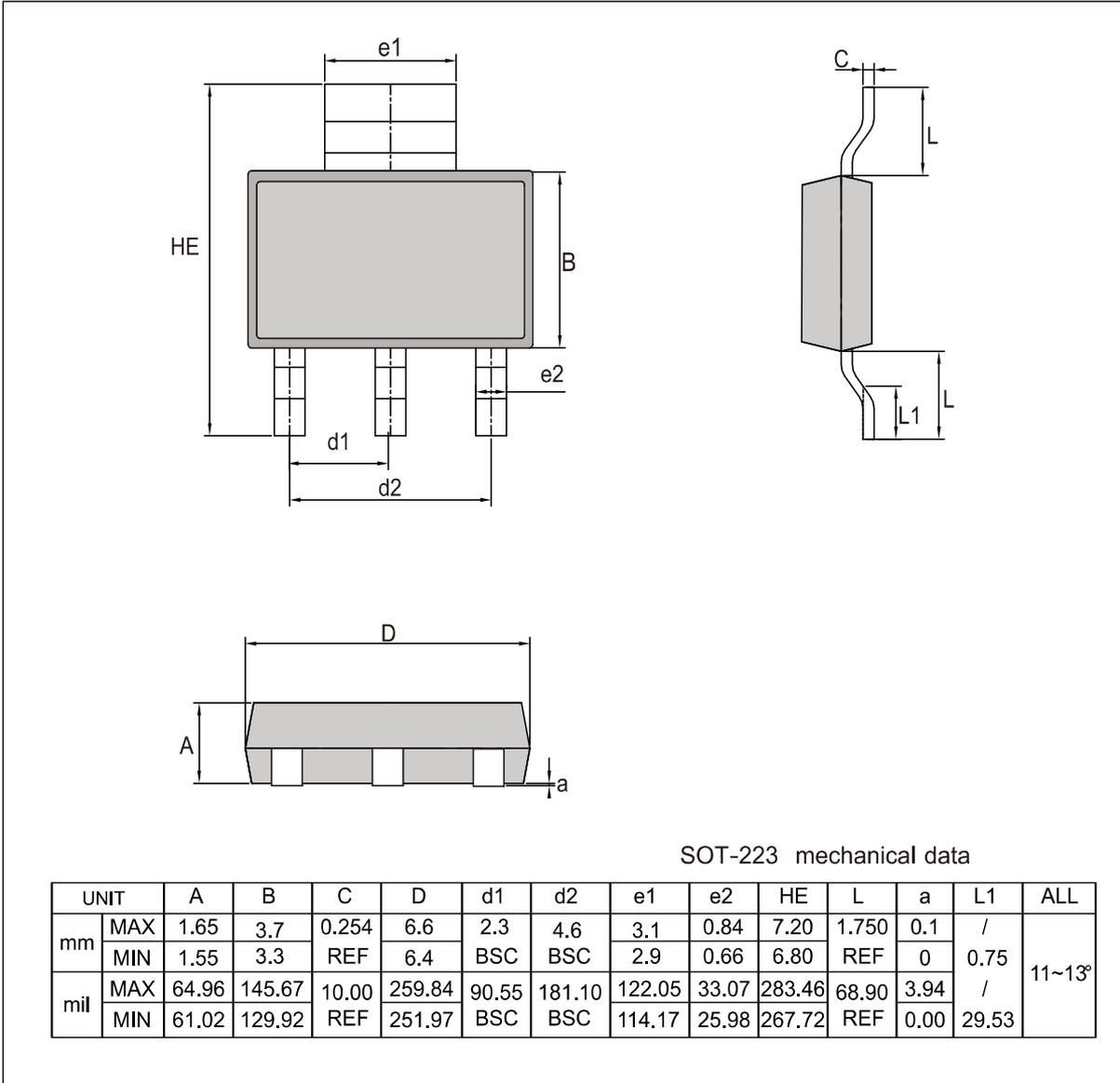
The recommended mounting pad size

3.8 / 0.15
2.0 / 0.075
2.3 / 0.091
2.3 / 0.091
5.5 / 0.217
2.0 / 0.079
1.5 / 0.059
SCALE:6:1 (mm/inches)
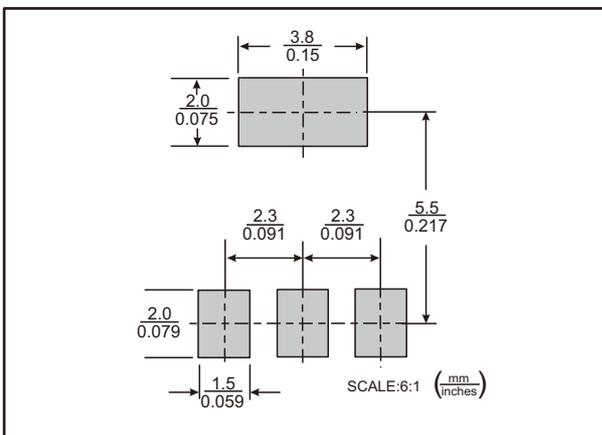
Marking

Type number	Marking code
NM3404BWK	J4B

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