



**NM3400**

**5.8A, 30V N-CHANNEL MOSFET**

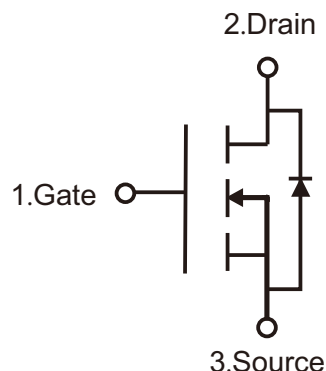
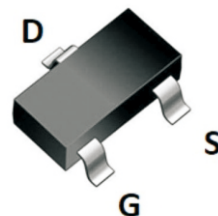
**Features**

- $R_{DS(ON)} \leq 30m\Omega @ V_{GS}=10V, I_D=4A$
- $R_{DS(ON)} \leq 35m\Omega @ V_{GS}=4.5, I_D=4A$
- $R_{DS(ON)} \leq 55m\Omega @ V_{GS}=2.5, I_D=3A$
- High Speed Switching
- High Density Cell Design For Low  $R_{DS(ON)}$
- Trench Power LV MOSFET Technology

**Features**

- Load Switch
- PWM Application
- Power Management

SOT-23



**Absolute Maximum Ratings (TA=25°C, unless otherwise specified)**

Parameter	Symbols	Ratings	Units
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	5.8	A
Pulsed Drain Current(A)	$I_{DM}$	23	A
Power Dissipation	$P_D$	1.2	W
Thermal Resistance,Junction to Case(B)	$R_{\theta JA}$	100	$^{\circ}C/W$
Operation Junction Temperature and Storage Temperature	$T_j, T_{stg}$	-55 ~ +150	$^{\circ}C$



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

Parameter	Symbols	Test Conditions	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	B <sub>VDS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30	32		V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V			1	μA
Gate- Source Leakage Current	Forward	I <sub>GSS</sub>			100	nA
	Reverse				-100	
<b>On Characteristics</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	0.6	0.9	1.5	V
Static Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4A		21	33	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4A		23	35	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 3A		38	55	mΩ
Drain-Source Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 5.8A, V <sub>GS</sub> = 0V			1.2	V
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0MHz		630		pF
Output Capacitance	C <sub>oss</sub>			55		pF
Reverse Transfer Capacitance	C <sub>rss</sub>			71		pF
<b>Switching Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 5.8A		17.5		nC
Gate-Source Charge	Q <sub>gs</sub>			2.1		nC
Gate-Drain Charge	Q <sub>gd</sub>			2		nC
Turn-On Delay Time	t <sub>D(on)</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 5.8A, R <sub>GEN</sub> = 3Ω		4.4		ns
Turn-On Rise Time	t <sub>r</sub>			28.2		ns
Turn-Off Delay Time	t <sub>D(off)</sub>			16.2		ns
Turn-Off Fall Time	t <sub>f</sub>			26		ns

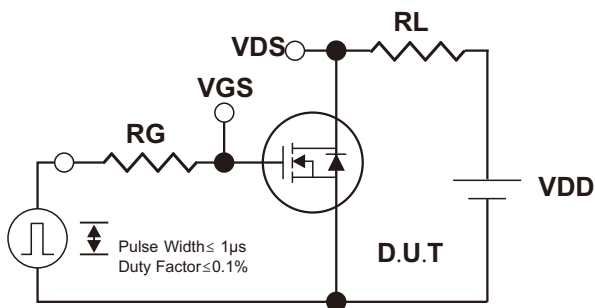
Notes:

A. Pulse Test: Pulse Width ≤ 300μs, Duty cycle ≤ 2%.

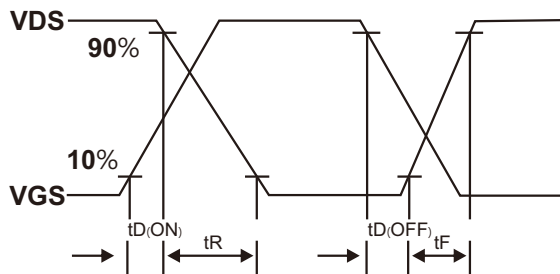
B. RθJA is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the soldermounting surface of the drain pins. RθJC is guaranteed by design, while RθJA is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.



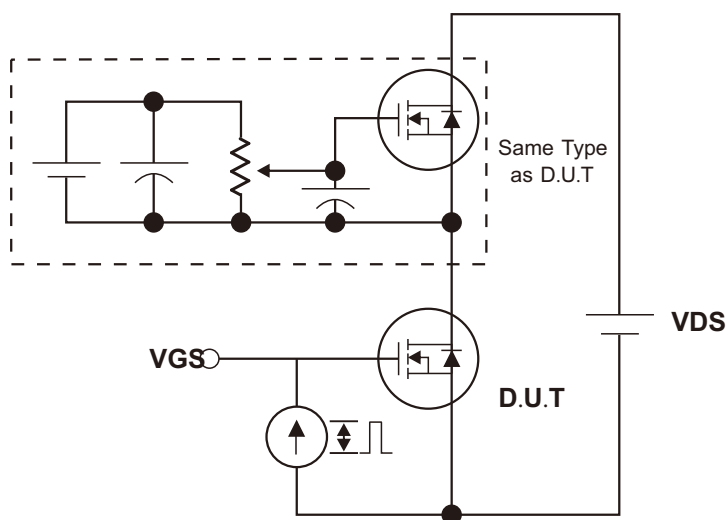
### Test Circuits and waveforms



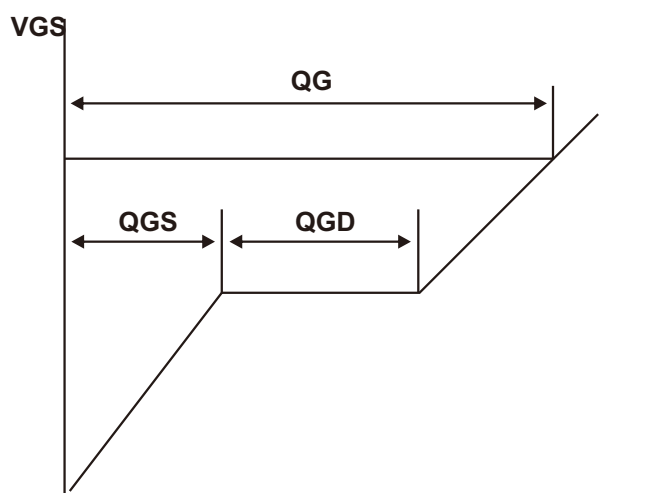
Switching Test Circuit



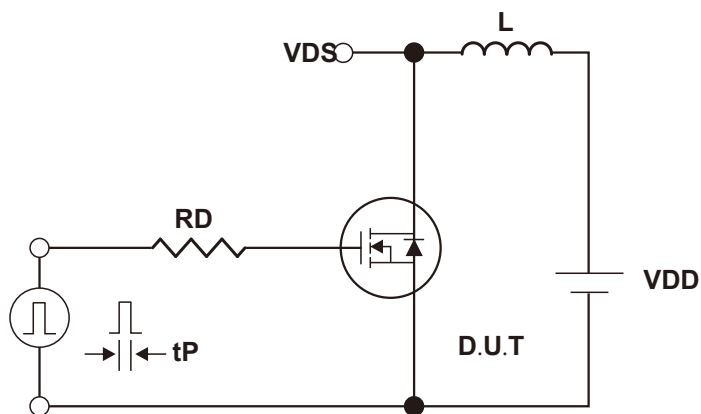
Switching Waveforms



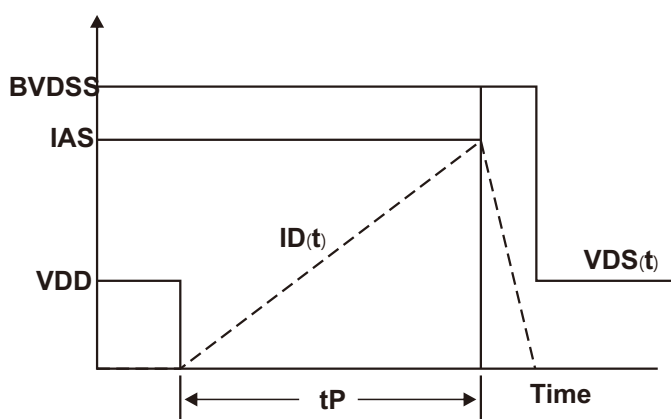
Gate Charge Test Circuit



Charge  
Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms



### Typical Characteristics

Fig.1 Output Characteristics

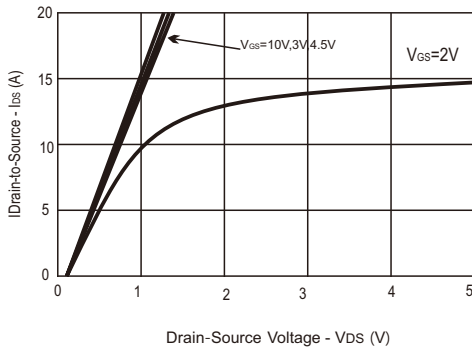


Fig.2 Typical Transfer Characteristics

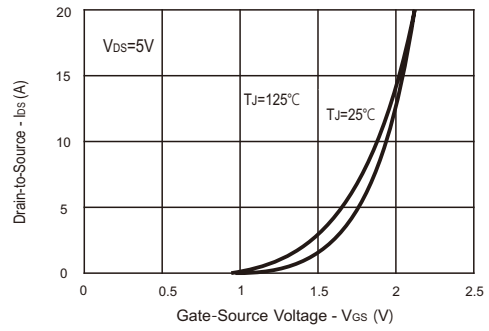


Fig.3 Drain-Source On-Resistance vs. Drain Current

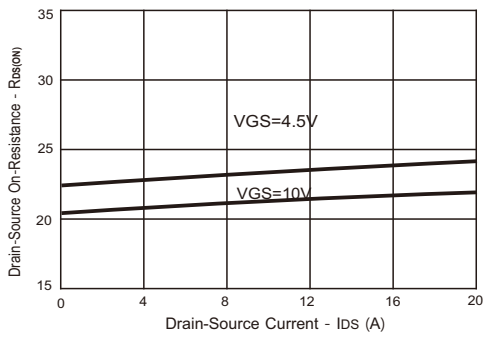


Fig.4 On-Resistance vs. Junction temperature

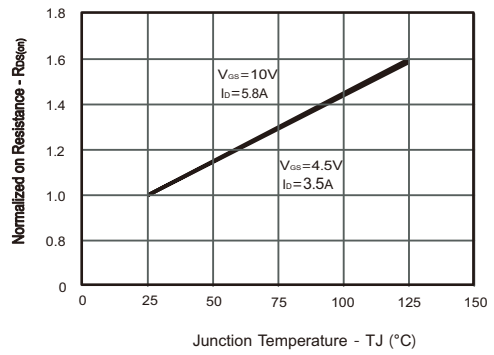


Fig.5 Gate-Charge Characteristics

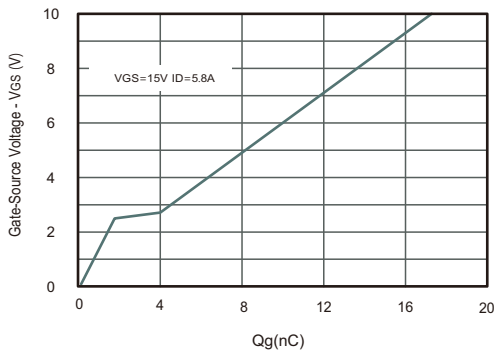
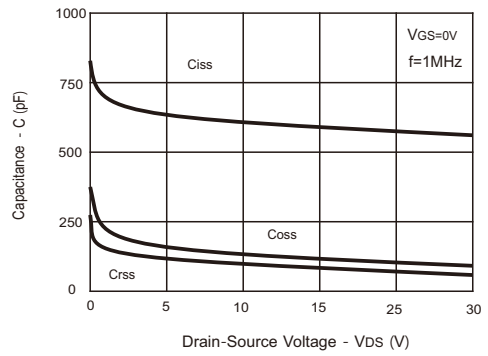
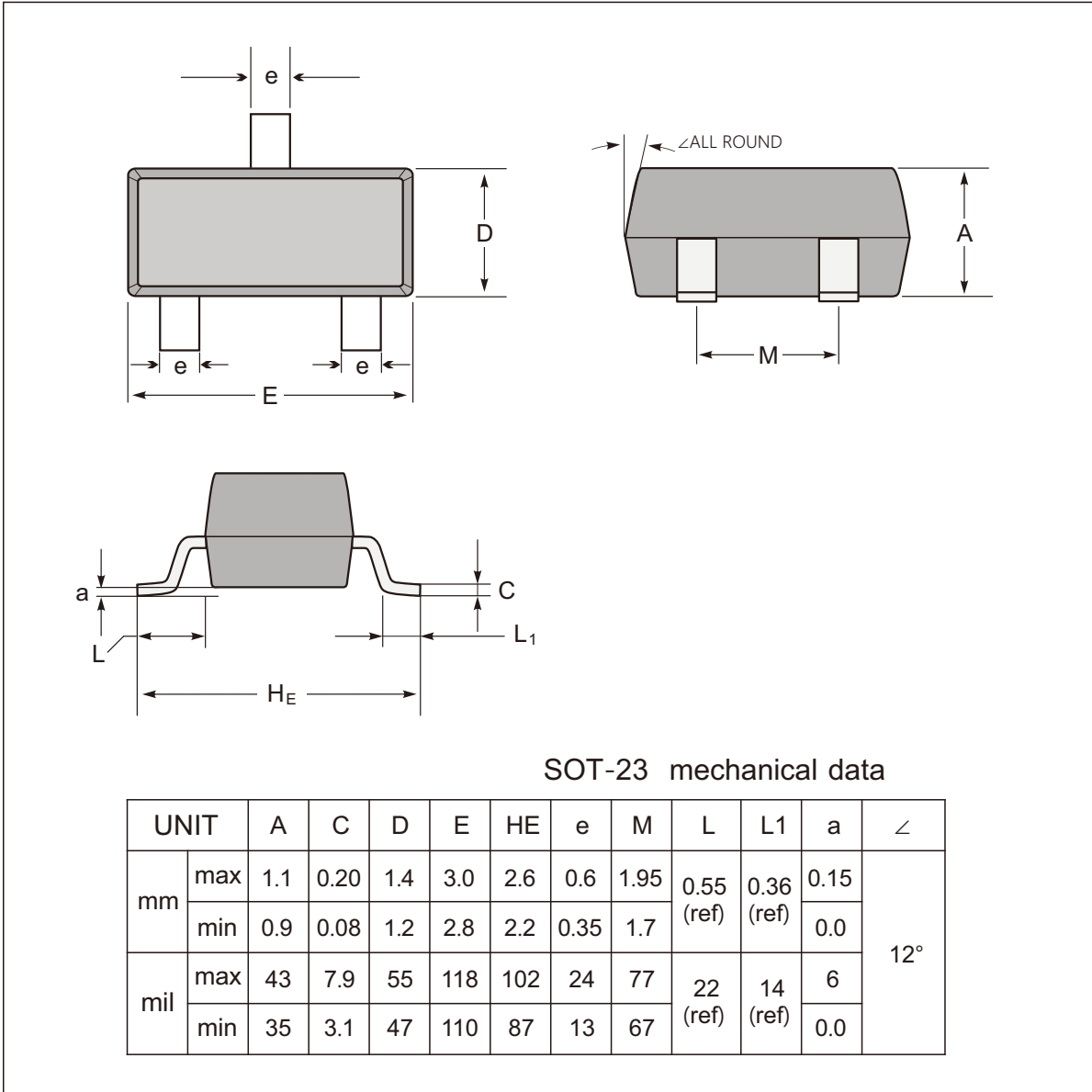


Fig.6 Capacitance vs. Drain-Source Voltage

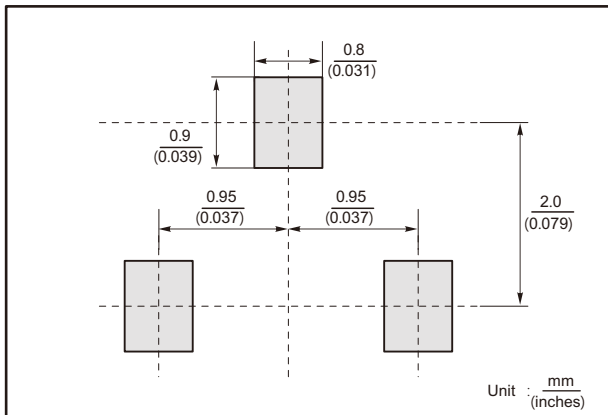




### SOT-23 Package Outline Dimensions



#### The recommended mounting pad size



#### Marking

Type number	Marking code
NM3400	3400



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