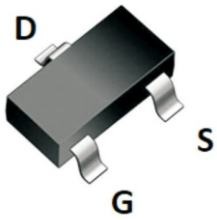
NM2312A

5A, 20V N-CHANNEL MOSFET

SOT-23

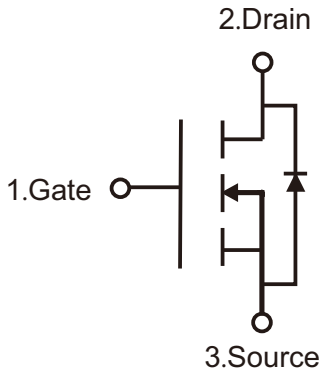


Features

- $R_{DS(ON)}$ ≤ 47mΩ @ V_{GS}=2.5V
- $R_{DS(ON)}$ ≤ 41mΩ @ V_{GS}=4.5V
- Trench Power MV MOSFET technology
- High Density Cell Design for Low $R_{DS(ON)}$
- High Speed switching

Application

- Load Switch
- PWM Application
- Bettery protection



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

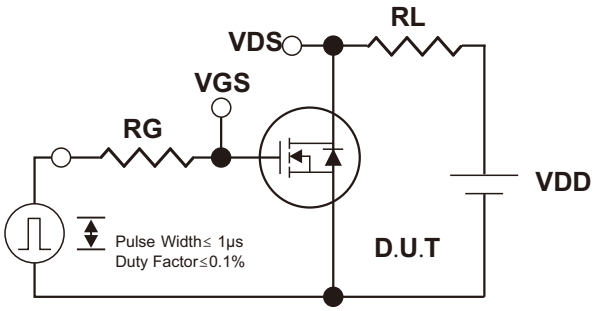
Parameter	Symbols	Ratings	Units
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±8	V
Continuous Drain Current	I_D	5.0	A
Pulsed Drain Current (Note1)	I_{DM}	20	A
Power Dissipation	P_D	1	W
Thermal Resistance,Junction to Ambient(Note2)	$R_{\theta JA}$	125	°C/W
Operation Junction Temperature and Storage Temperature	T_j, T_{stg}	-55 ~ +150	°C

Notes:
1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins.RθJC is guaranteed by design, whileRθJA is determined by the board design. The maximum rating presentedhere is based on mounting on a 1 in 2 pad of 2oz copper.

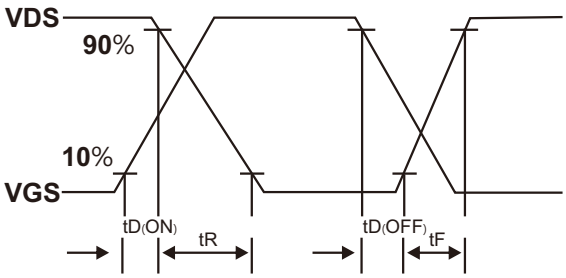
Electrical Characteristics (TA=25°C, unless otherwise specified)

Parameter		Symbols	Test Conditions	Min	Typ	Max	Units
Off Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V,I_D=250uA	20			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=20V,V_{GS}=0V			1	uA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=8V,V_{DS}=0V			100	nA
	Reverse		V_{GS}=-8V,V_{DS}=0V			-100	
On Characteristics							
Gate Threshold Voltage		$V_{th(GS)}$	V_{DS}=V_{GS},I_D=250uA	0.4	0.6	1.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=2.5V,I_D=4.5A		24	47	mΩ
			V_{GS}=4.5V,I_D=5.0A		21	41	mΩ
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=1.7A,V_{GS}=0V			1.4	V
Dynamic Characteristics							
Input Capacitance		C_{iss}	V_{DS}=10V,		595		pF
Output Capacitance		C_{oss}	V_{GS}=0V,		68		pF
Reverse Transfer Capacitance		C_{rss}	f=1.0MHz		49		pF
Switching Characteristics							
Total Gate Charge		Q_g	V_{DS}=10V,V_{GS}=4.5V, ID=5A		11.16		nC
Gate-Source Charge		Q_{gs}			0.99		nC
Gate-Drain Charge		Q_{gd}			2.14		nC
Turn-On Delay Time		$t_{d(on)}$	V_{DS}=10V,V_{GS}=4.5V I_D=5A,R_{GEN}=3Ω		5		ns
Turn-On Rise Time		t_r			29		ns
Turn-O ffDelay Time		$t_{d(off)}$			20		ns
Turn-O ffFall Time		t_f			2		ns

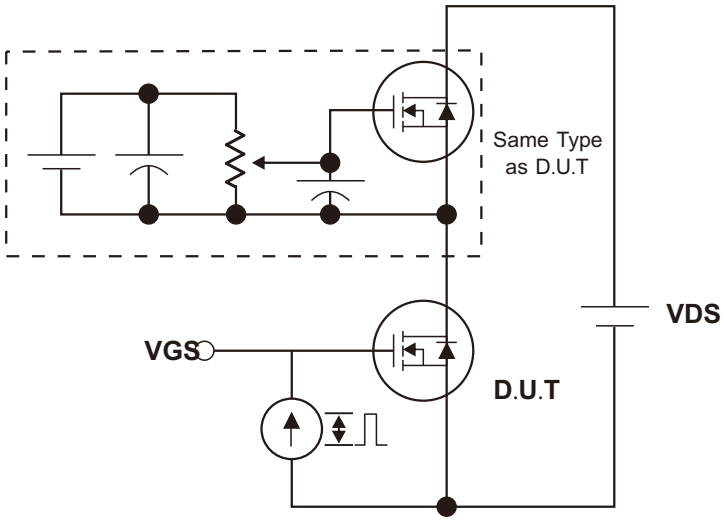
Test Circuits and waveforms



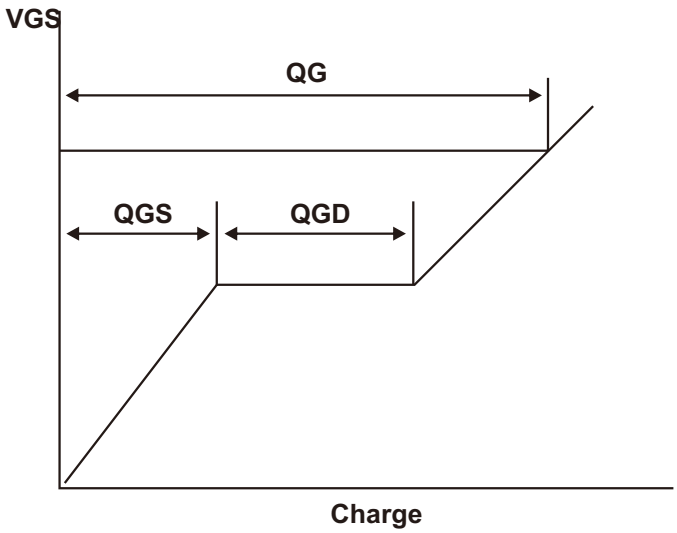
Switching Test Circuit



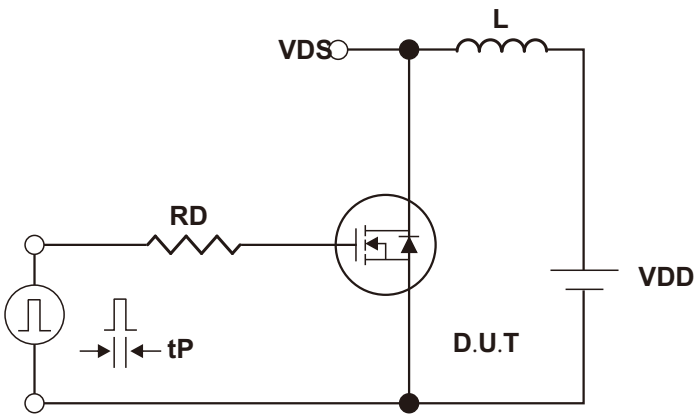
Switching Waveforms



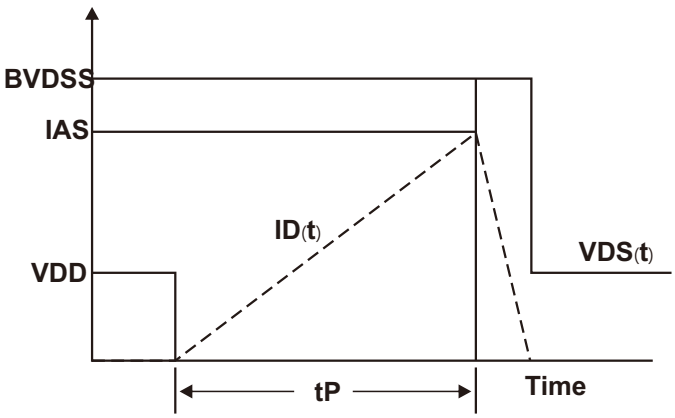
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

Typical Characteristics

Fig.1 Output Characteristics

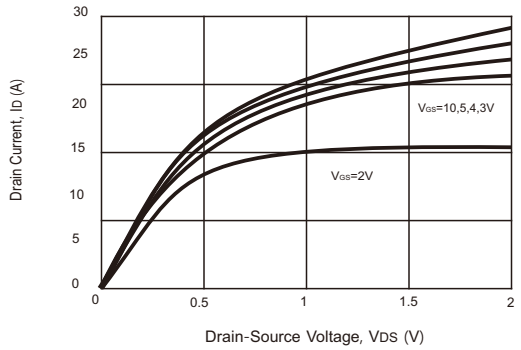


Fig.2 Typical Transfer Characteristics

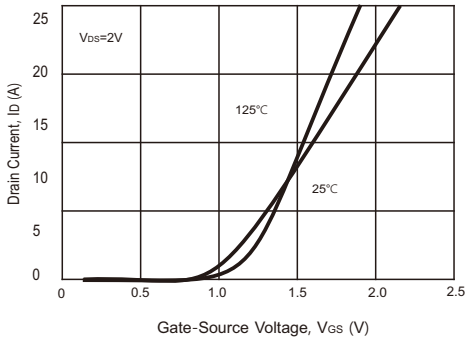


Fig.3 On-Resistance vs. Drain Current and Gate-Voltage

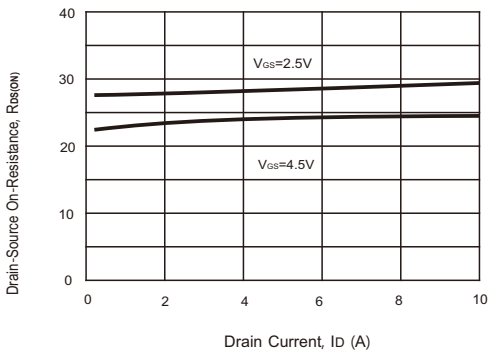


Fig.4 On-Resistance vs. Junction Temperature

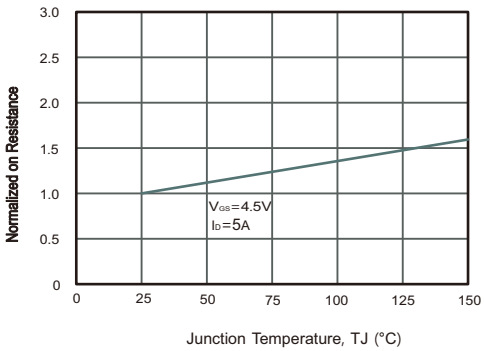
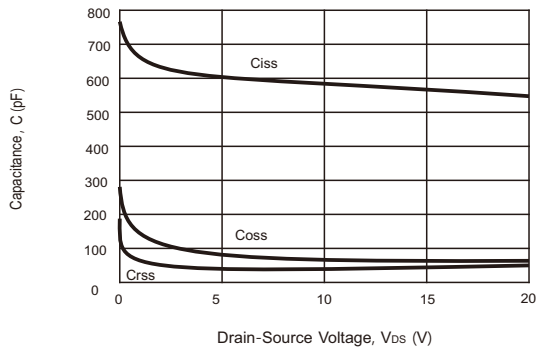
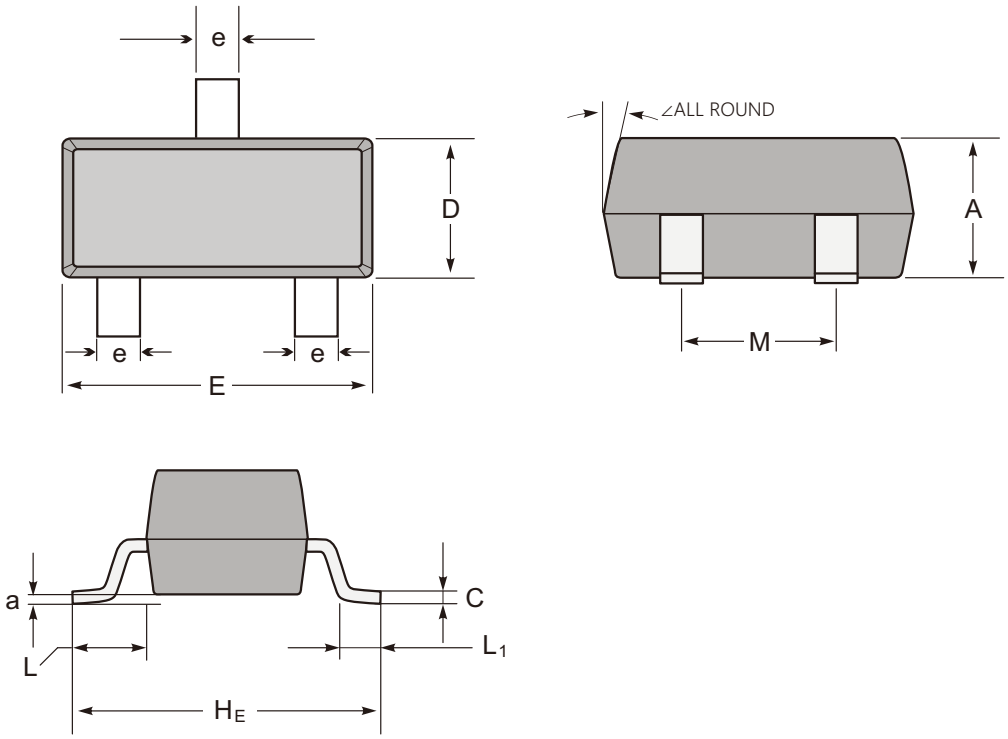


Fig.5 Capacitance Characteristics



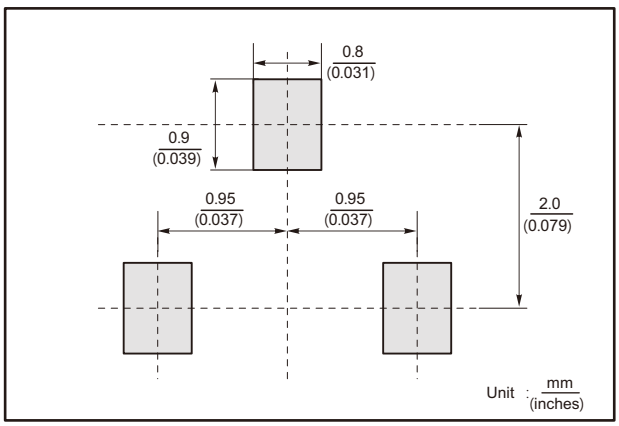
SOT-23 Package Outline Dimensions



SOT-23 mechanical data

UNIT		A	C	D	E	HE	e	M	L	L1	a	∠
mm	max	1.1	0.20	1.4	3.0	2.6	0.6	1.95	0.55 (ref)	0.36 (ref)	0.15	12°
	min	0.9	0.08	1.2	2.8	2.2	0.35	1.7			0.0	
mil	max	43	7.9	55	118	102	24	77	22 (ref)	14 (ref)	6	
	min	35	3.1	47	110	87	13	67			0.0	

The recommended mounting pad size



Marking

Type number	Marking code
NM2312A	2312A

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