



20V N-Channel Enhancement-Mode MOSFET

Description

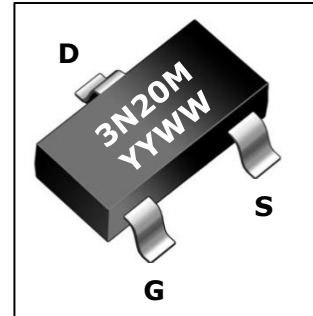
The AM03N20 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

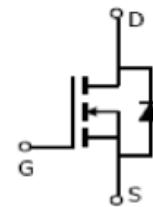
- $V_{DS} = 20V$
Max. $R_{DS(ON)}$, $V_{GS}@4.5V$, $I_{DS}@3.0A = 60m\Omega$
Max. $R_{DS(ON)}$, $V_{GS}@2.5V$, $I_{DS}@2.0A = 115m\Omega$
Max. $R_{DS(ON)}$, $V_{GS}@1.8V$, $I_{DS}@2.0A = 130m\Omega$
- High Power and current handling capability
- Lead Free product is acquired
- Surface Mount Package

Application

- Battery protection
- Load switch
- Power management



Internal Schematic Diagram



N-Channel MOSFET

Typical Application

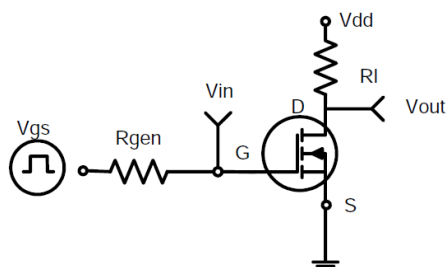


Figure 1: Switching Test Circuit

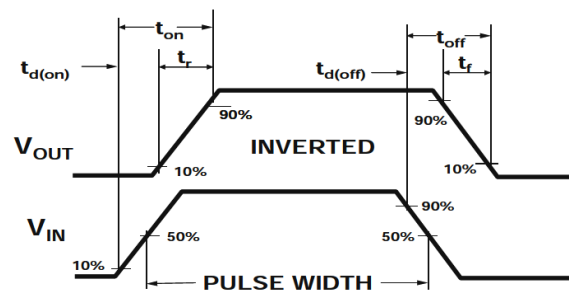


Figure 2: Switching Waveforms



Maximum Ratings and Thermal Characteristics (T_A=25 °C, unless otherwise noted)

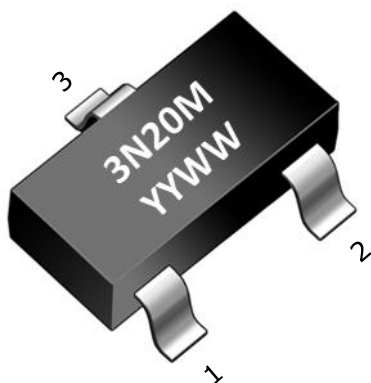
Rating		Symbol	Value	Unit
Drain-Source Voltage		V _{DS}	20	V
Gate-Source Voltage		V _{GS}	±12	
Drain Current-Continuous@ Current-Pulsed (Note 1)		I _D (25°C)	3.0	A
		I _{DM}	12	
Maximum Power Dissipation	T _A = 25°C	P _D	1.25	W
	T _A = 75°C		0.8	
Operating Junction and Storage Temperature Range		T _J ,T _{STG}	-55 to 150	°C
Thermal Resistance, Junction – to –Ambient (Note 2)		R _{θJA}	140	°C/W

Note : 1. Repetitive Rating : Pulse width limited by the maximum junction temperature
2. 1-in2 2oz Cu PCB board

Ordering Information

Device	Package	Packing	Finish	Halogen	Packing Unit
AM3N20	SOT-23	Reel&Tape	Sn	Free	3,000 ea

Package Outline



SOT-23

PIN INFO. 1. Gate 2. Source 3. Drain



Electrical Characteristic ($T_C=25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250 μ A	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μ A
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±12V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μ A	0.6	0.8	1.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =3.0A		34	60	m Ω
		V _{GS} =2.5V, I _D =2.0A		44	115	
		V _{GS} =1.8V, I _D =2.0A		78	130	
DYNAMIC CHARACTERISTICS (Note1)						
Input Capacitance	C _{iss}	V _{DS} = 10V, V _{GS} = 0V, F = 1.0MHz		624		pF
Output Capacitance	C _{oss}			190		pF
Reverse Transfer Capacitance	C _{rss}			145		pF
SWITCHING CHARACTERISTICS (Note 1)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =15V, R _L = 5.5Ω V _{GS} = 4.5V, R _{GEN} = 6Ω I _D = 1A		13.8		nS
Turn-on Rise Time	t _r			9.6		nS
Turn-Off Delay Time	t _{d(off)}			29.8		nS
Turn-Off Fall Time	t _f			7.2		nS
Total Gate Charge	Q _g	V _{DS} = 10V, I _D = 3.6A, V _{GS} = 4.5V		4.2		nC
Gate-Source Charge	Q _{gs}			0.78		nC
Gate-Drain Charge	Q _{gd}			0.98		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =0.94A		0.76	1.16	V
Diode Forward Current	I _S				1.6	A

NOTES:

- Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 1. Guaranteed by design, not subject to production testing.



Typical Performance Characteristics

Fig.1 Output Characteristic

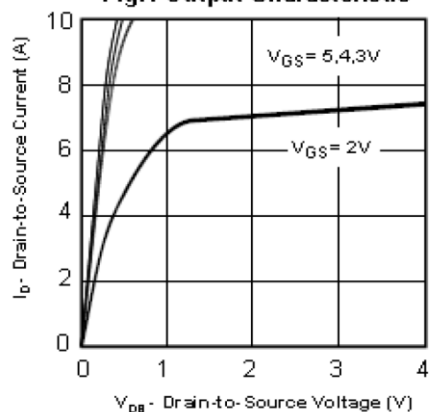


Fig.2 Transfer Characteristics

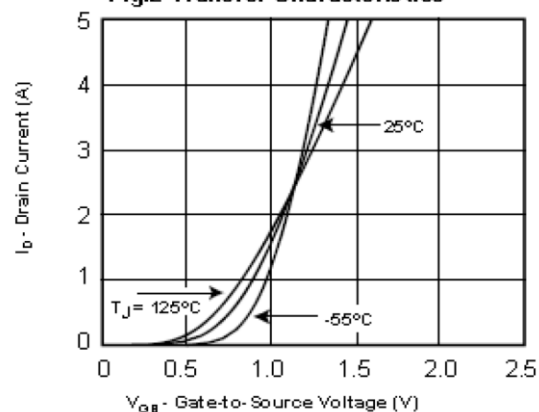


Fig.3 On-Resistance Variation with Temperature

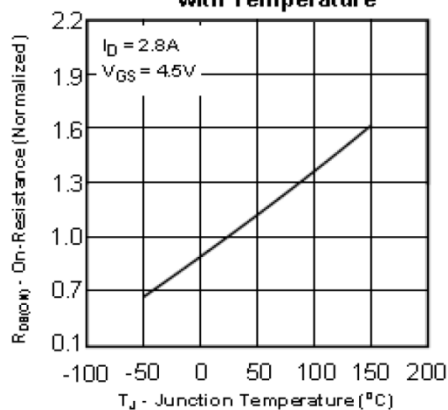


Fig.4 Body Diode Forward Voltage Variation with Source Current

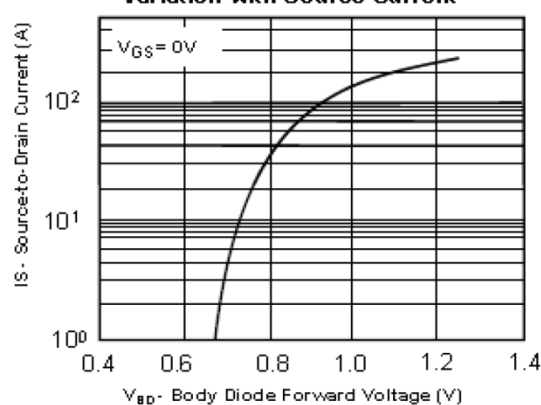


Fig.5 Gate Threshold Variation with Temperature

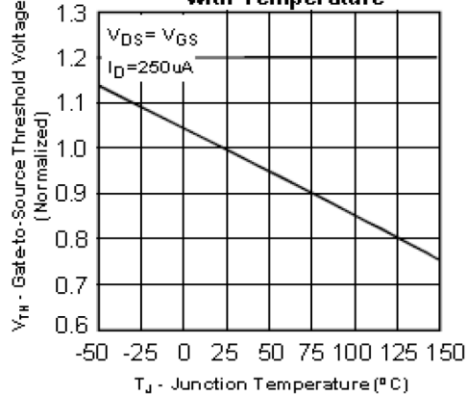
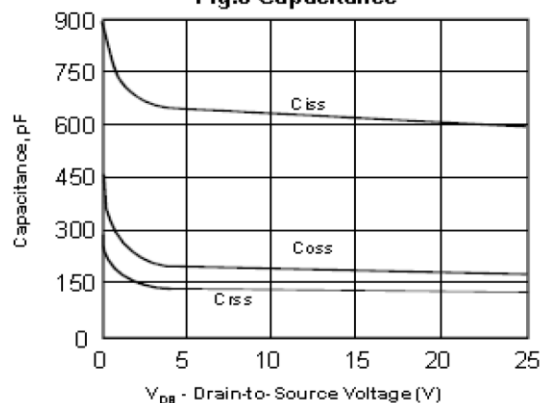


Fig.6 Capacitance





Typical Performance Characteristics

Fig. 7 Gate Charge Waveform

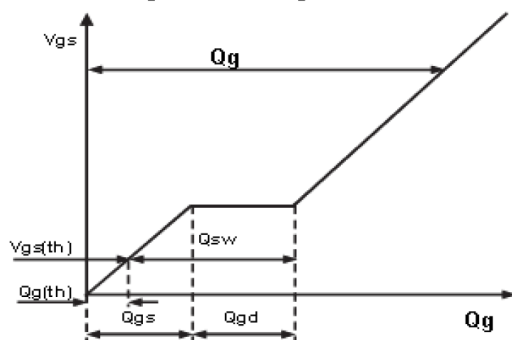


Fig. 8 Gate Charge

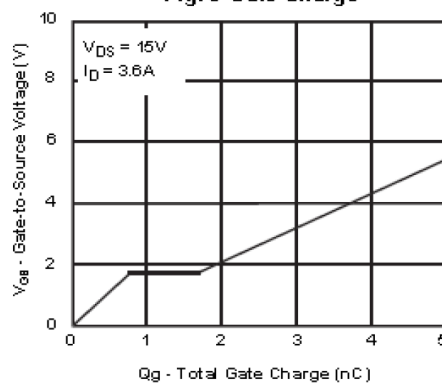


Fig. 9 Maximum Safe Operating Area

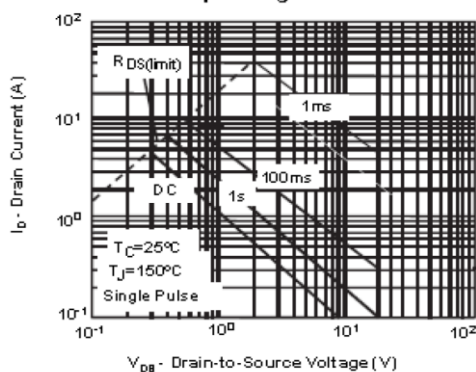
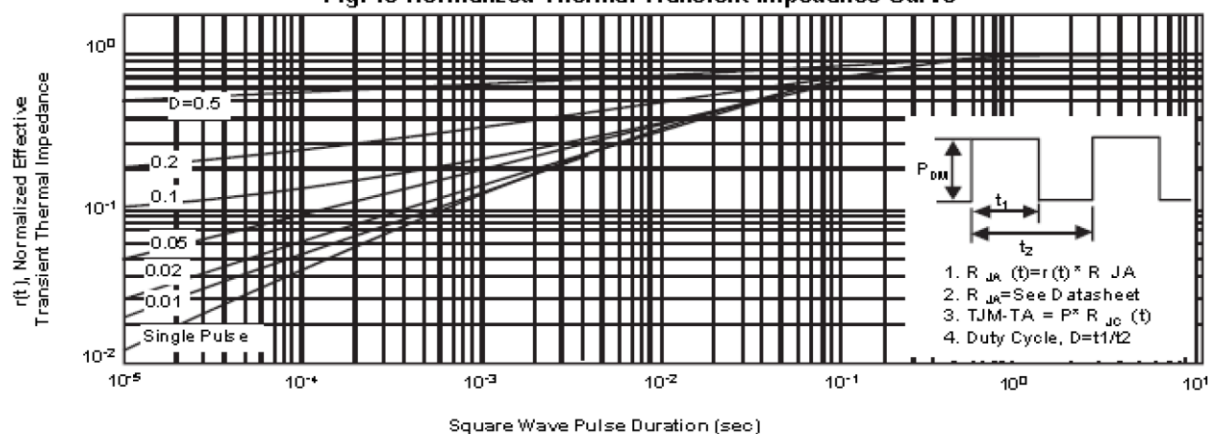


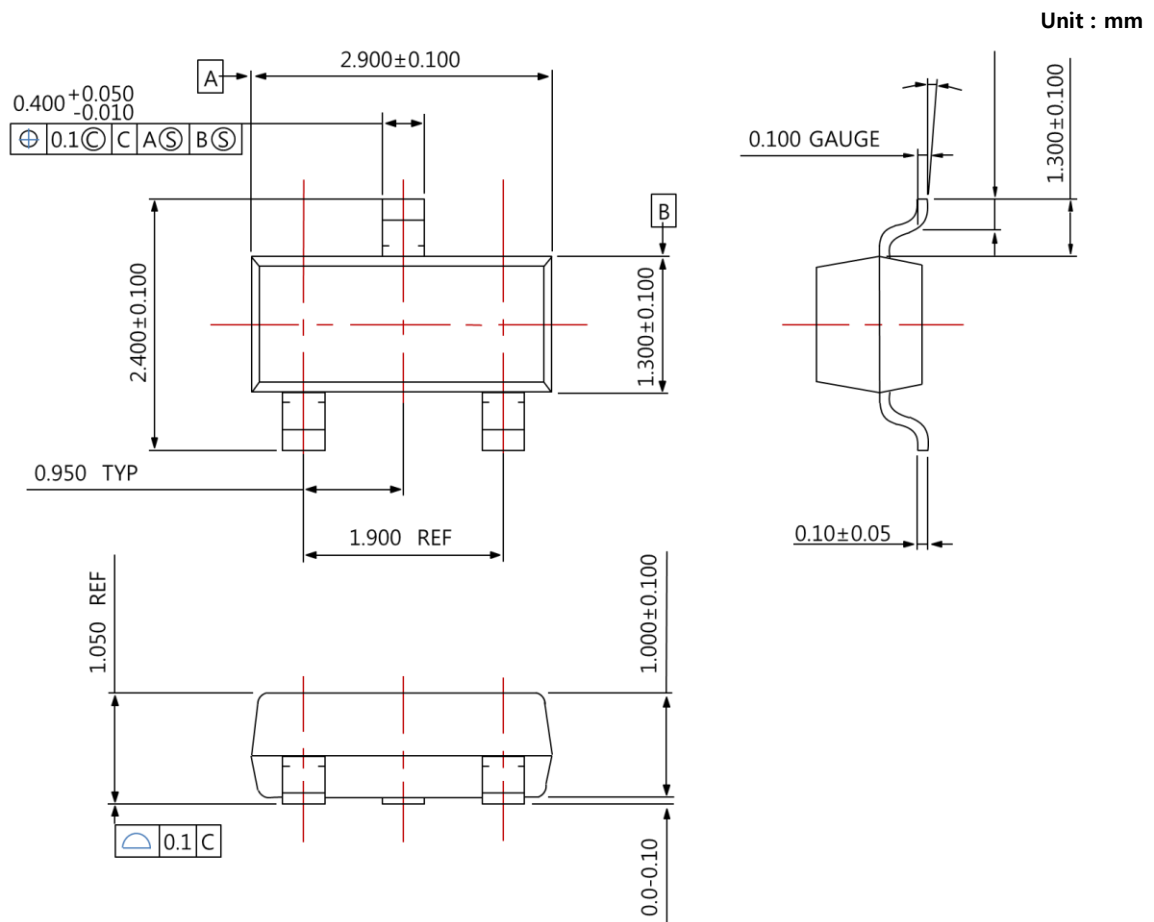
Fig. 10 Normalized Thermal Transient Impedance Curve





Package Dimensions

SOT -23





Revision History

No	Date	Contents
0	2015-08-30	Initial Brief Datasheet Release



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