



## Features

- 20V/12A
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

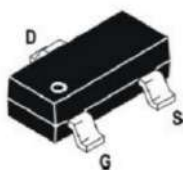
## Applications

- Portable Equipment and Battery Powered Systems.
- DC-DC converter
- Load Switch

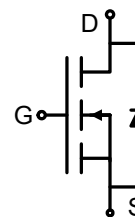
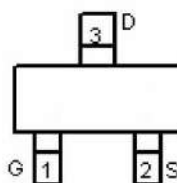
## Product Summary

$V_{DS}$	20	V
$R_{DS(on),Typ}@ V_{GS}=4.5 V$	11.5	m $\Omega$
$I_D$	12	A

Top view



SOT23-3



## Absolute Maximum Ratings (T<sub>A</sub>=25°C Unless Otherwise Noted)

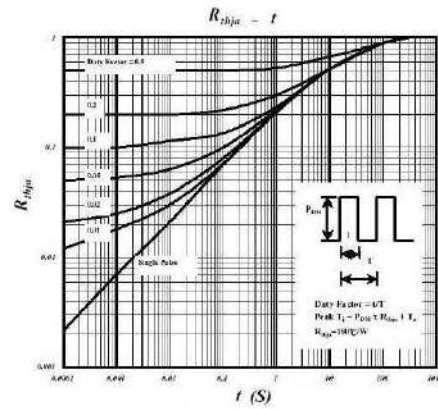
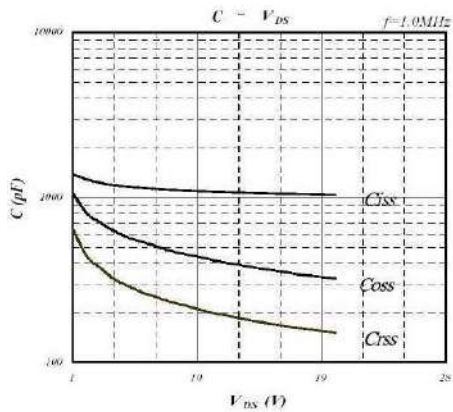
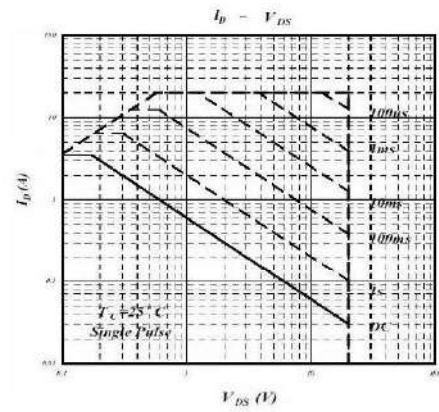
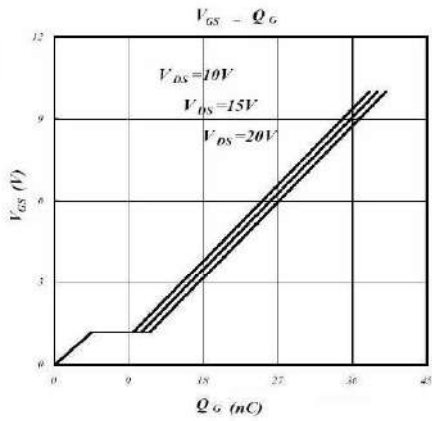
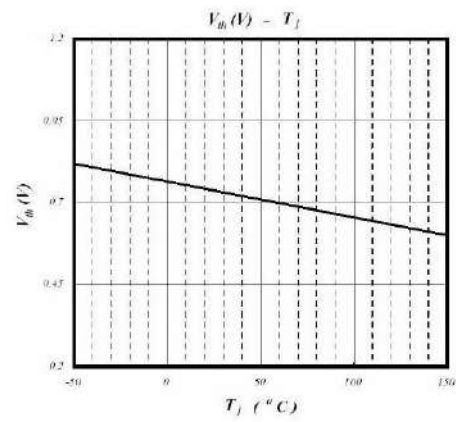
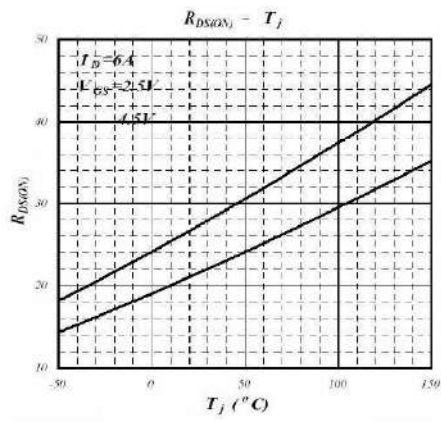
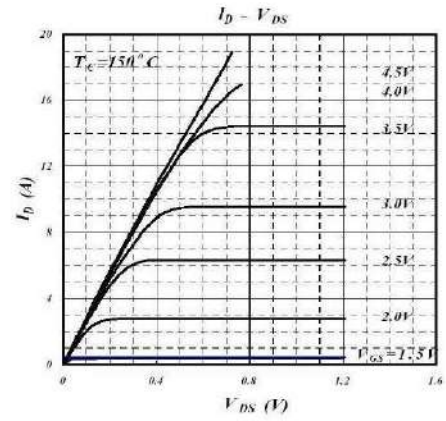
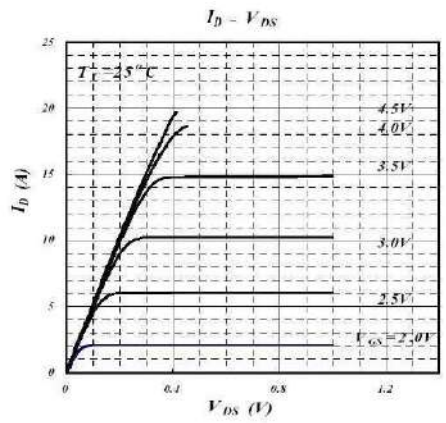
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Drain Current - Continuous	$I_D(T_a=25^\circ C)$	12	A
Drain Current - Continuous	$I_D(T_a=70^\circ C)$	4.8	A
Drain Current – Pulsed	$I_{DM}$	48	A
Gate-Source Voltage	$V_{GS}$	±8.0	V
Maximum Power Dissipation	$P_D(T_a=25^\circ C)$	1.14	W
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	110	°C/W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_{stg}$	-55 ~ 150	°C

**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  Unless Otherwise Noted)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V$	$I_D=250\mu A$	20			V
Drain-Source Leakage Current( $T=25^{\circ}\text{C}$ )	$I_{DSS}$	$V_{DS}=16V$	$V_{GS}=0V$			1	$\mu A$
Drain-Source Leakage Current( $T=70^{\circ}\text{C}$ )	$I_{DSS}$	$V_{DS}=16V$	$V_{GS}=0V$			30	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V$	$V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$	$I_D=250\mu A$	0.55		0.95	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V$	$I_D=5A$		11.5	12.5	m $\Omega$
		$V_{GS}=2.5V$	$I_D=3A$		15.5	16.5	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=10V$	$I_D=6.0A$		20		S
Forward On Voltage	$V_{SD}$	$V_{GS}=0V$	$I_S=1.7A$			1.3	V
Input Capacitance	$C_{iss}$	$V_{DS}=20V$ $f=1.0MHz$	$V_{GS}=0V$		1035		pF
Output Capacitance	$C_{oss}$				320		pF
Reverse Transfer Capacitance	$C_{rss}$				150		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=10V$ $V_{GS}=5V$ $R_D=10\Omega$	$I_D=1A$ $R_G=6\Omega$		30		ns
Rise Time	$t_r$				70		ns
Turn-off Delay Time	$t_{d(off)}$				40		ns
Fall Time	$t_f$				65		ns

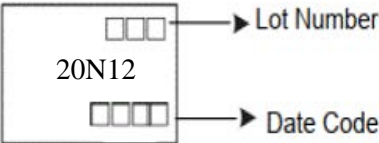
**Notes:**

- 1、Surface Mounted on FR4 Board,  $t \leq 10$  sec.
- 2、Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

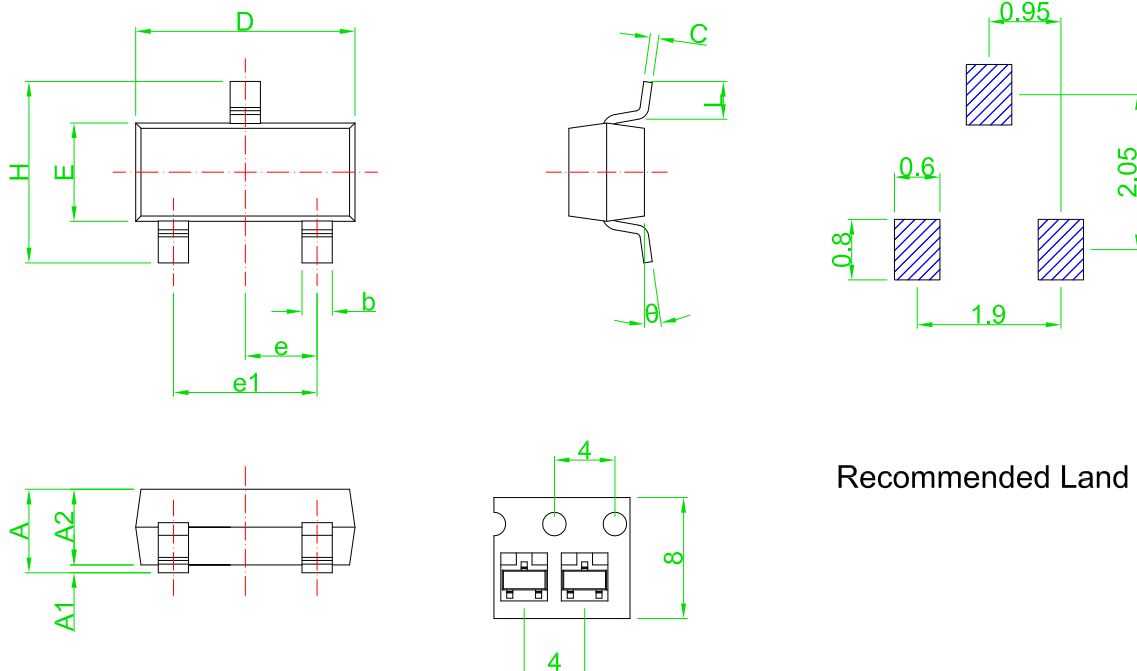


### Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
JM3E20N12ZB-R	20N12	SOT23-3	Tape&Reel	3000/Reel

PACKAGE	MARKING
SOT23-3	 <p>The diagram shows a rectangular marking area for the SOT23-3 package. In the center, the text '20N12' is printed. Above this text are three small squares, with an arrow pointing to the label 'Lot Number'. Below the text are four small squares, with an arrow pointing to the label 'Date Code'.</p>

SOT23-3 PACKAGE IN FORMATION



Recommended Land Pattern

Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.55	0.012	0.022
C	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
e	0.95 TYP		0.037 TYP	
e1	1.80	2.00	0.071	0.079
H	2.25	2.55	0.089	0.100
L	0.30	0.50	0.012	0.020
theta	0°	8°	0°	8°

**Disclaimer**

The content specified herein is for the purpose of introducing JMW's products (hereinafter "Products"). The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

JMW does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of the Products or technical information described in this document.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). JMW shall bear no responsibility in any way for use of any of the Products for the above special purposes.

Although JMW endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a JMW product.

The content specified herein is subject to change for improvement without notice. When using a JMW product, be sure to obtain the latest specifications.