### **Description**

### **N-channel Enhancement Mode Power MOSFET**

#### **Features**

100V, 3A

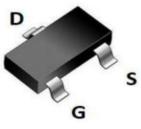
 $R_{DS(ON)}$  < 115m $\Omega$  @  $V_{GS}$  = 10V $R_{DS(ON)} < 127 m\Omega @ V_{GS} = 4.5 V$ 

- · Advanced Trench Technology
- Excellent R<sub>DS(ON)</sub> and Low Gate Charge
- Lead Free

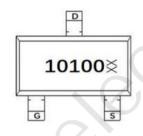
#### **Applications**

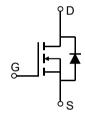
- Load Switch
- PWM Application
- **Power Management**











SOT-23-3L

**Marking and Pin Assignment** 

**Schematic Diagram** 

#### Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
10100	CRMJTL10120A	TAPING	SOT-23-3L	7"	3000	120000

### Absolute Maximum Ratings (@ T<sub>C</sub> = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units	
V <sub>DS</sub>	Drain-to-Source Voltage  Gate-to-Source Voltage		100	V	
V <sub>GS</sub>			±20	V	
	Continuous Drain Current	T <sub>C</sub> = 25°C	3	A	
I <sub>D</sub>		T <sub>C</sub> = 100°C	2		
I <sub>DM</sub>	Pulsed Drain Current (1)		12	Α	
$P_D$	Power Dissipation $T_C = 25^{\circ}C$		1.38	W	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		90	°C/W	
T <sub>J</sub> , T <sub>STG</sub>	Junction & Storage Temperature Range		-55 to 150	°C	



## **Electrical Characteristics** (T<sub>J</sub> = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Off Cha	aracteristics					
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0 V$	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V	-	-	1.0	μА
I <sub>GSS</sub>	Gate-Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	1	±100	nA
On Cha	aracteristics					
V <sub>GS(th)</sub>	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1.0	1.5	2.5	V
		$V_{GS} = 10V, I_{D} = 3A$	-	92.0	115.0	mΩ
$R_{DS(ON)}$		$V_{GS} = 4.5V, I_D = 2A$	-	98.0	127.0	mΩ
Dynam	ic Characteristics					
C <sub>iss</sub>	Input Capacitance		-	847	-	pF
C <sub>oss</sub>	Output Capacitance	$V_{GS} = 0V, V_{DS} = 25V,$		40	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f = 1MHz		12	-	pF
Q <sub>g</sub>	Total Gate Charge			20	-	nC
$Q_{gs}$	Gate Source Charge	$V_{GS} = 0 \text{ to } 10V$ $V_{DS} = 50V, I_{D} = 2A$	<u></u>	2.8	-	nC
$Q_{gd}$	Gate Drain("Miller") Charge	V <sub>DS</sub> - 50V, I <sub>D</sub> - 2A	-	4	-	nC
Switchi	ing Characteristics					
$t_{d(on)}$	Turn-On DelayTime		-	6	-	ns
t <sub>r</sub>	Turn-On Rise Time	$V_{GS} = 10V, V_{DD} = 50V$	-	7	-	ns
$t_{d(off)}$	Turn-Off DelayTime	$I_D$ = 3A, $R_{GEN}$ =1.8 $\Omega$	-	21	-	ns
t <sub>f</sub> Turn-Off Fall Time			-	3	-	ns
Drain-S	Source Diode Characteristics and I	Max Ratings				
Is	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	А
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	12	Α
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{S} = 3A$	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	1 = 24 di/dt = 4004/:	_	15	-	ns
Qrr Body Diode Reverse Recovery Charge		$I_F = 3A$ , di/dt = 100A/us	-	20	-	nC

Notes:

Version: 1.0

<sup>1.</sup> Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

<sup>2.</sup> Pulse Test: Pulse Width≤300µs, Duty Cycle≤0.5%.

## **Typical Performance Characteristics**

Figure 1: Output Characteristics

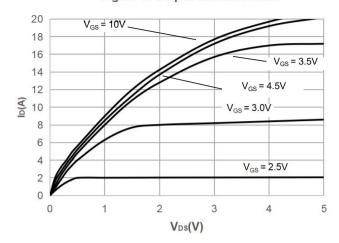


Figure 2: Typical Transfer Characteristics

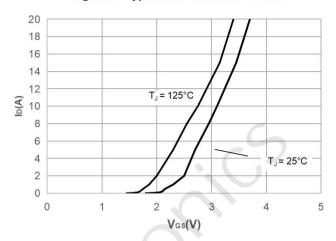


Figure 3: On-resistance vs. Drain Current

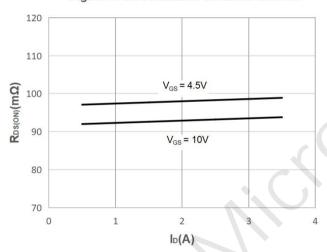


Figure 4: Body Diode Characteristics

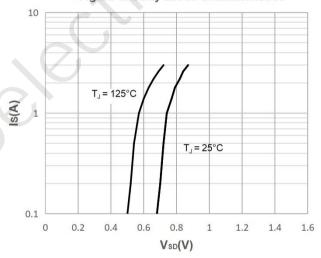


Figure 5: Gate Charge Characteristics

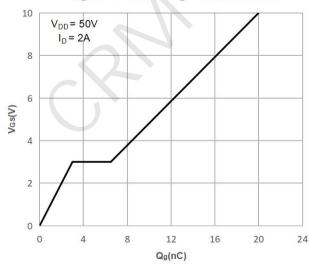
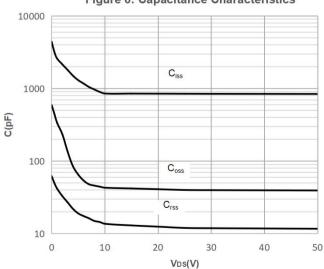


Figure 6: Capacitance Characteristics



## **Typical Performance Characteristics**

Figure 7: Normalized Breakdown voltage vs.
Junction Temperature

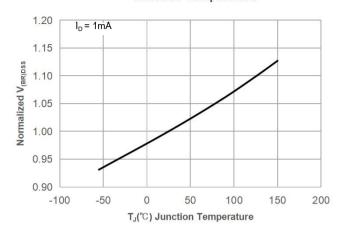


Figure 8: Normalized on Resistance vs. Junction Temperature

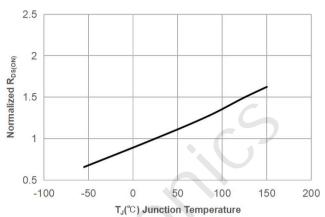


Figure 9: Maximum Safe Operating Area

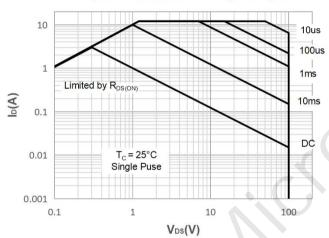


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

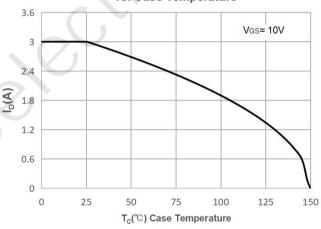


Figure 11: Normalized Maximum Transient Thermal Impedance

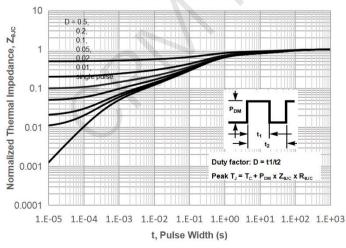
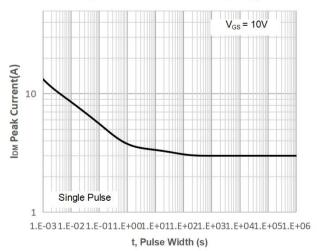


Figure 12: Peak Current Capacity





### **Test Circuit**

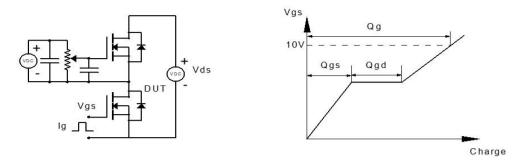


Figure 1: Gate Charge Test Circuit & Waveform

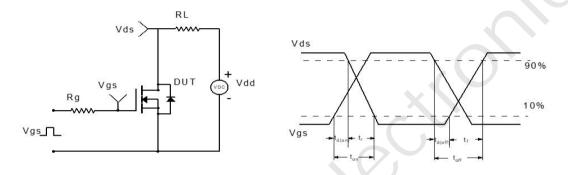


Figure 2: Resistive Switching Test Circuit & Waveform

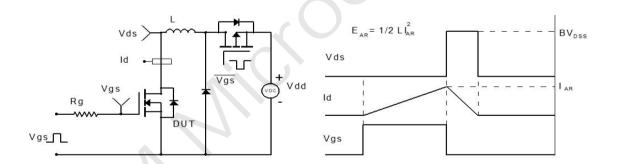


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

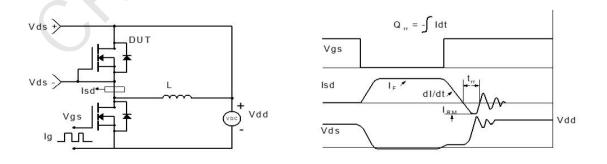
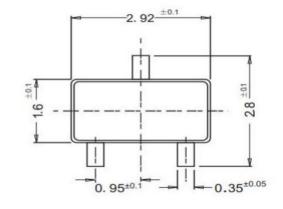
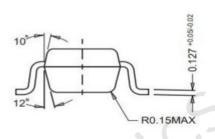
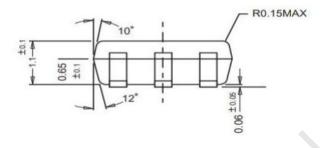


Figure 4: Diode Recovery Test Circuit & Waveform

## Package Mechanical Data(SOT-23-3L)







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