Description

N-channel Advanced Mode Power MOSFET

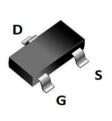
Features

- 100V, 3A
 - $R_{DS(ON)}$ Typ= $95m\Omega$ @ V_{GS} = 10V $R_{DS(ON)}$ Typ= $135m\Omega$ @ V_{GS} =4.5V
- Advanced Split Gate Trench Technology
- Excellent R_{DS(ON)} and Low Gate Charge
- Lead Free

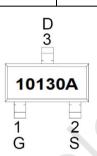
Applications

- DC/DC Converter
- LED Backlighting
- Motor Control

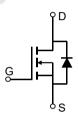




SOT-23



Marking and Pin Assignment



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Outline	Package	Reel Size	Reel(pcs)	Per Carton (pcs)
10130A	CRMLGL10130A	TAPING	SOT-23	7"	3000	120000

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		Value	Units	
V _{DS}	Drain-to-Source Voltage		100	V	
V_{GS}	Gate-to-Source Voltage		±20	V	
I _D	Continuous Drain Current	T _A = 25°C	3	- A	
		T _A = 100°C	2.2		
I_{DM}	Pulsed Drain Current (1)		12	Α	
P_{D}	Power Dissipation	T _A = 25°C	3.1	W	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁽²⁾		40.3	°C/W	
T_J , T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C	



Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Unit
Off Cha	aracteristics					
V _{(BR)DSS}	Drain-Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0 V$	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 100V, V _{GS} = 0V	-	-	1.0	μА
I _{GSS}	Gate-Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	±100	nA
On Cha	aracteristics					
V _{GS(th)}	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1.0	1.65	2.5	V
_	(3)	$V_{GS} = 10V, I_{D} = 3A$	-	95	130	mΩ
$R_{DS(ON)}$	Static Drain-Source ON-Resistance ⁽³⁾	$V_{GS} = 4.5V, I_D = 1A$	-	135	190	mΩ
Dynam	ic Characteristics					
C _{iss}	Input Capacitance		- /	200	-	pF
C _{oss}	Output Capacitance	$V_{GS} = 0V$, $V_{DS} = 50V$, $f = 1MHz$		30	-	pF
C _{rss}	Reverse Transfer Capacitance	T = TMHZ	-	3	-	pF
Q_g	Total Gate Charge			4	-	nC
Q_{gs}	Gate Source Charge	$V_{GS} = 0 \text{ to } 10V$		0.9	-	nC
Q_{gd}	Gate Drain("Miller") Charge	$V_{DS} = 50V, I_{D} = 3A$	<u>.</u>	1.1	-	nC
Switch	ing Characteristics					
$t_{d(on)}$	Turn-On DelayTime		-	13	-	ns
t _r	Turn-On Rise Time	$V_{GS} = 10V, V_{DD} = 50V$	-	19	-	ns
$t_{\text{d(off)}}$	Turn-Off DelayTime	$I_D = 3A$, $R_{GEN} = 3\Omega$	-	20	-	ns
t _f	Turn-Off Fall Time		-	28	-	ns
Drain-S	Source Diode Characteristics and I	Max Ratings				
I _s	Maximum Continuous Drain to Source Dioc	-	-	3	Α	
I _{SM}	Maximum Pulsed Drain to Source Diode Fo	-	-	12	Α	
V _{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{S} = 3A$	-	_	1.2	V

Notes:

- 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
- 2. $R_{\theta JA}$ is measured with the device mounted on a 1inch $^{\!2}$ pad of 2oz copper FR4 PCB
- 3. Pulse Test: Pulse Width \leq 300 μ s, Duty Cycle \leq 0.5%.



Typical Performance Characteristics

Figure 1: Output Characteristics

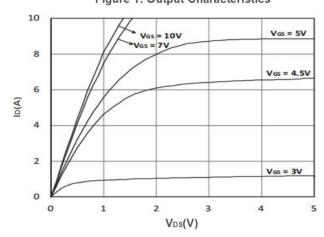


Figure 2: Typical Transfer Characteristics

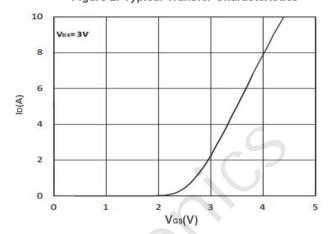


Figure 3: On-resistance vs. Drain Current

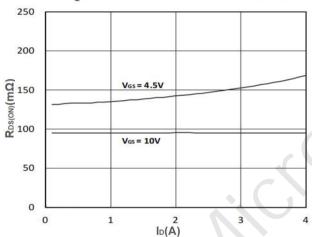


Figure 4: Body Diode Characteristics

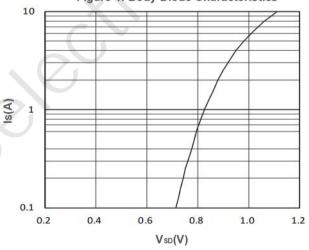


Figure 5: Gate Charge Characteristics

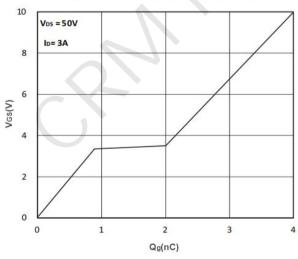
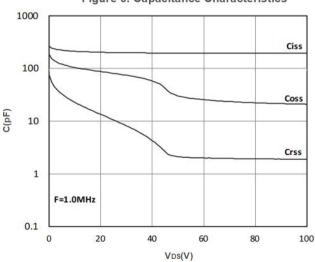


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs.

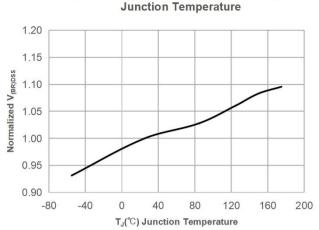


Figure 8: Normalized on Resistance vs.

Junction Temperature

2.5

2.0

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Figure 9: Maximum Safe Operating Area

100 10 lo(A) Limited by Rose 0.1 Single Pulse 10m T_C=25°C T,=150°C 0.01 0.1 1 10 100 1000 V_{DS}(V)

Figure 10: Maximum Continuous Drian Current vs. Case Temperature

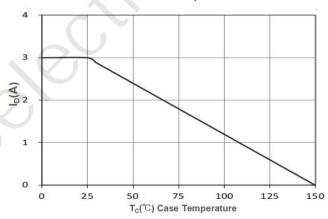


Figure 11: Normalized Maximum Transient Thermal Impedance

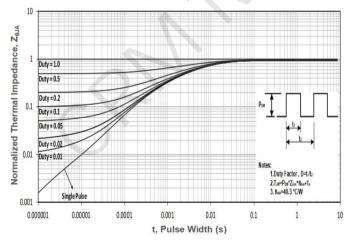
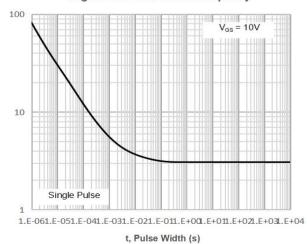


Figure 12: Peak Current Capacity



IDM Peak Current(A)

Test Circuit

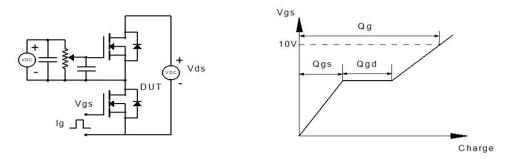


Figure 1: Gate Charge Test Circuit & Waveform

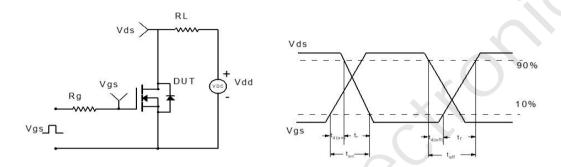


Figure 2: Resistive Switching Test Circuit & Waveform

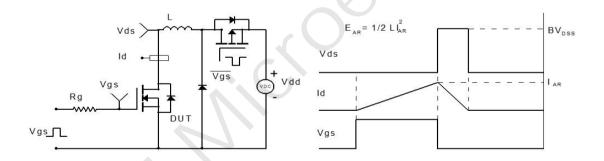


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

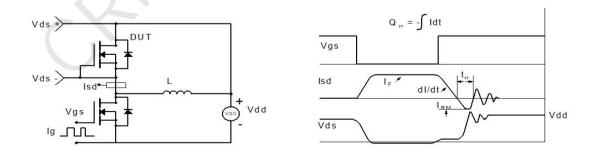
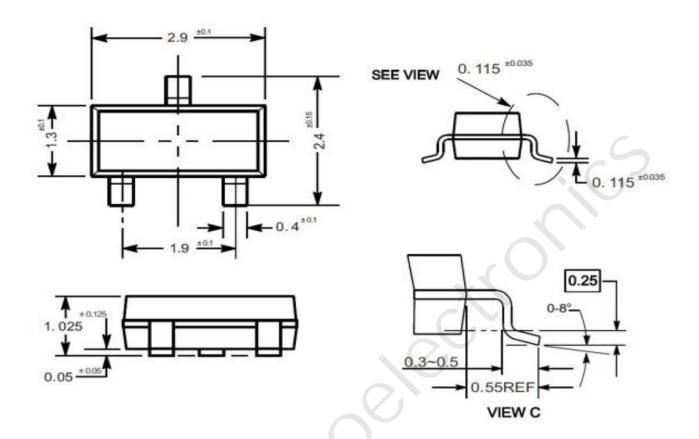


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23)



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