

### Description

#### Features

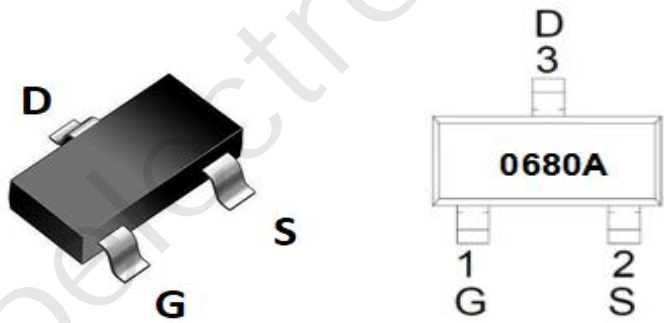
- 60V, 3.5A  
 $R_{DS(ON)}$  Typ = 60mΩ @  $V_{GS} = 10V$   
 $R_{DS(ON)}$  Typ = 70mΩ @  $V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free



Schematic Diagram

#### Application

- Load Switch
- PWM Application
- Power Management



Marking and Pin Assignment

#### Package Marking and Ordering Information

Device	Marking	Package	Outline	Reel Size	Reel (pcs)	Per Carton (pcs)
CRMLTL0680A	0680A	SOT-23	TAPING	7"	3000	120000

#### Absolute Maximum Ratings (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	60	V
$V_{GS}$	Gate-to-Source Voltage	±20	V
$I_D$	Continuous Drain Current	$T_A = 25^\circ\text{C}$	3.5
		$T_A = 100^\circ\text{C}$	2.1
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	14	A
$P_D$	Power Dissipation	$T_A = 25^\circ\text{C}$	1.39
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>(2)</sup>	90	°C/W
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	°C

### Electrical Characteristics ( $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
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#### Off Characteristics

$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$I_D = 250\mu\text{A}$ , $V_{GS} = 0\text{V}$	60	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 60\text{V}$ , $V_{GS} = 0\text{V}$	-	-	1.0	$\mu\text{A}$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS} = 0\text{V}$ , $V_{GS} = \pm 20\text{V}$	-	-	$\pm 100$	nA

#### On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$ , $I_D = 250\mu\text{A}$	1	1.6	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance <sup>(3)</sup>	$V_{GS} = 10\text{V}$ , $I_D = 2\text{A}$	-	60	78	mΩ
		$V_{GS} = 4.5\text{V}$ , $I_D = 1.5\text{A}$	-	70	91	mΩ

#### Dynamic Characteristics

$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$	-	430	-	pF
$C_{oss}$	Output Capacitance		-	37	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	33	-	pF
$Q_g$	Total Gate Charge	$V_{GS} = 0$ to $10\text{V}$ $V_{DS} = 30\text{V}$ , $I_D = 3\text{A}$	-	15	-	nC
$Q_{gs}$	Gate Source Charge		-	3	-	nC
$Q_{gd}$	Gate Drain("Miller") Charge		-	2.5	-	nC

#### Switching Characteristics

$t_{d(on)}$	Turn-On DelayTime	$V_{GS} = 10\text{V}$ , $V_{DD} = 30\text{V}$ $I_D = 3\text{A}$ , $R_{GEN} = 3\Omega$	-	6	-	ns
$t_r$	Turn-On Rise Time		-	11	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	13	-	ns
$t_f$	Turn-Off Fall Time		-	8	-	ns

#### Drain-Source Diode Characteristics and Max Ratings

$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	3.5	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	14	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0\text{V}$ , $I_S = 2\text{A}$	-	-	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<sup>2</sup> pad of 2oz copper FR4 PCB
  3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 0.5\%$ .

## Test Circuit



Figure 1: Gate Charge Test Circuit & Waveform



Figure 2: Resistive Switching Test Circuit & Waveform

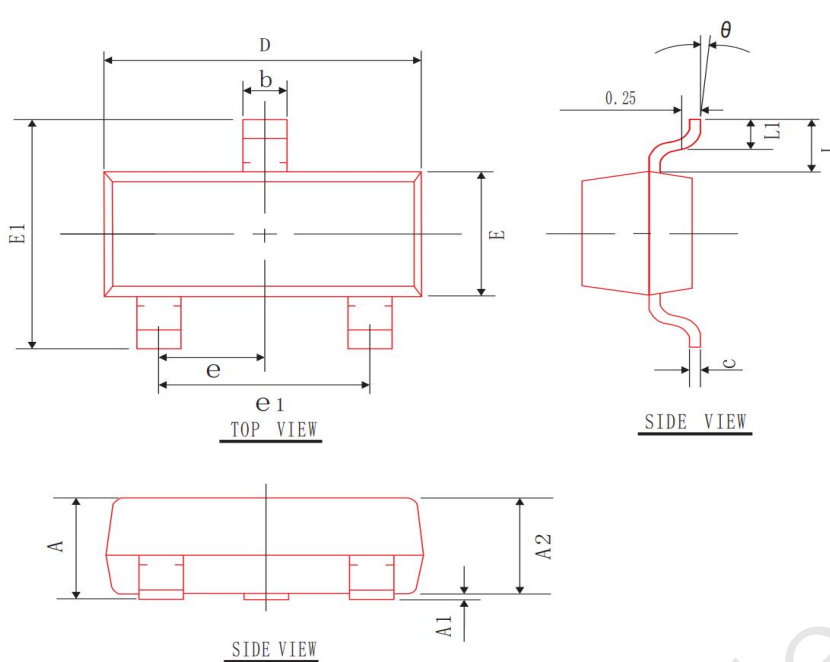


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform



Figure 4: Diode Recovery Test Circuit & Waveform

### Package Mechanical Data(SOT-23)



Symbol	Dimensions In Millimeters	
	Min.	Max
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
C	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950 TYP.	
e1	1.800	2.000
L	0.550 REF.	
L1	0.300	0.500
θ	0	8°

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