

Description

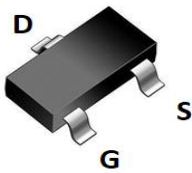
N-channel Enhancement Mode Power MOSFET

Features

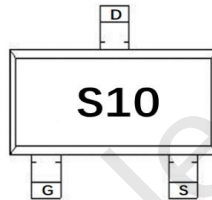
- 60V, 3A
 $R_{DS(ON)}$ Typ= 75mΩ @ $V_{GS} = 10V$
 $R_{DS(ON)}$ Typ= 85mΩ @ $V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

Applications

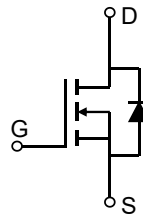
- Load Switch
- PWM Application
- Power Management



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)
S10	CRMLTL06100A	TAPING	SOT-23	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°C	3	A
		T _A = 100°C	2	
I _{DM}	Pulsed Drain Current ⁽¹⁾		12	A
P _D	Power Dissipation	T _A = 25°C	1.56	W
R _{θJA}	Thermal Resistance, Junction to Ambient ⁽²⁾		80	°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.	Typ.	Max.	Unit
Off Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	I _D = 250μA, V _{GS} = 0V	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V	-	-	1.0	μA
I _{GSS}	Gate-Body Leakage Current	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.4	2.0	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽³⁾	V _{GS} = 10V, I _D = 3A	-	75	100	mΩ
		V _{GS} = 4.5V, I _D = 2A	-	85	110	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz	-	350	-	pF
C _{oss}	Output Capacitance		-	29	-	pF
C _{rss}	Reverse Transfer Capacitance		-	23	-	pF
Q _g	Total Gate Charge	V _{GS} = 0 to 10V V _{DS} = 30V, I _D = 3A	-	9	-	nC
Q _{gs}	Gate Source Charge		-	1.5	-	nC
Q _{gd}	Gate Drain("Miller") Charge		-	2	-	nC
Switching Characteristics						
t _{d(on)}	Turn-On DelayTime	V _{GS} = 10V, V _{DD} = 30V I _D = 2A, R _{GEN} = 3Ω	-	5	-	ns
t _r	Turn-On Rise Time		-	7	-	ns
t _{d(off)}	Turn-Off DelayTime		-	37	-	ns
t _f	Turn-Off Fall Time		-	22	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	12	A
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_{θJA} is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB
 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

Typical Performance Characteristics

Figure 1: Output Characteristics

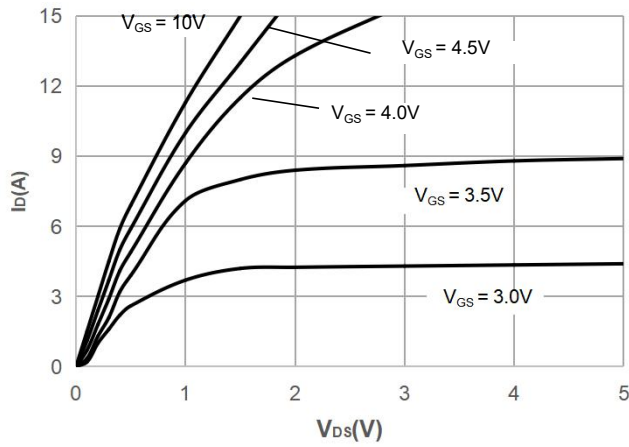


Figure 2: Typical Transfer Characteristics

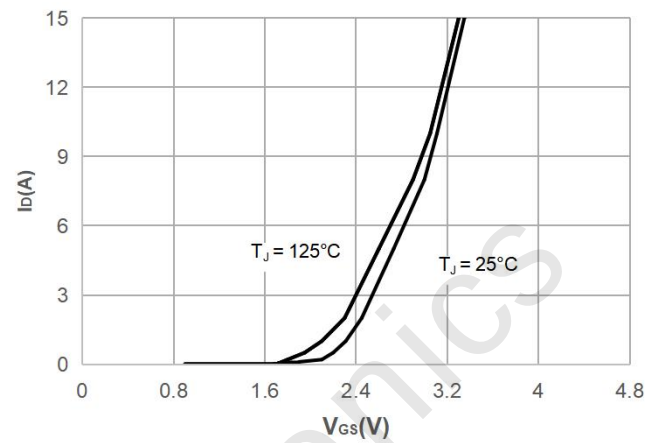


Figure 3: On-resistance vs. Drain Current

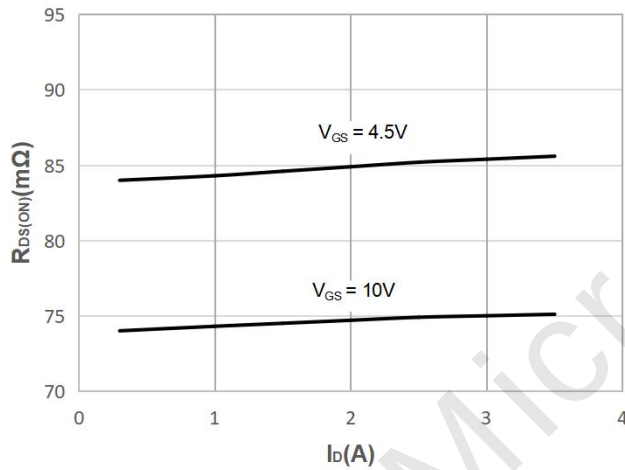


Figure 4: Body Diode Characteristics

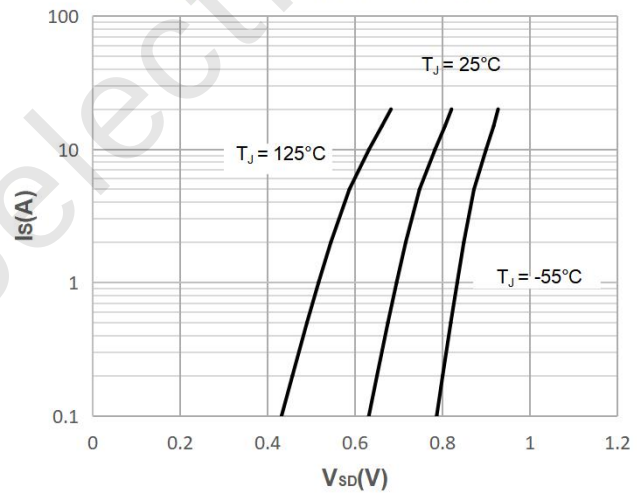


Figure 5: Gate Charge Characteristics

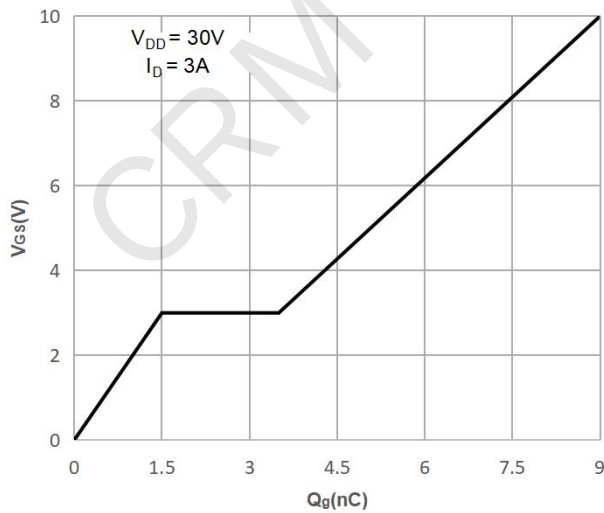
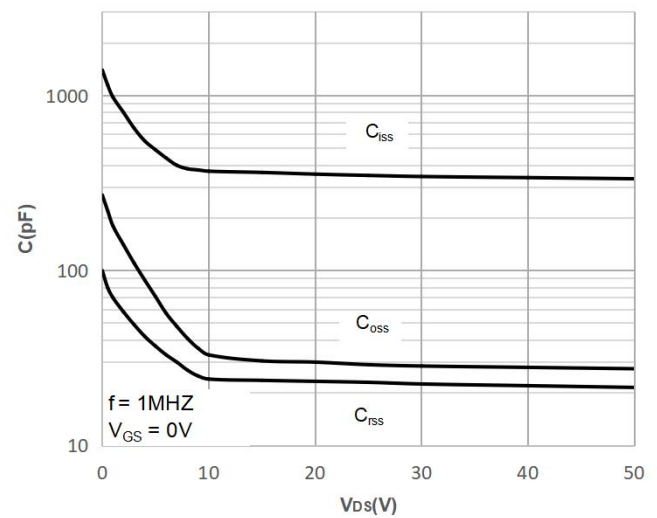


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

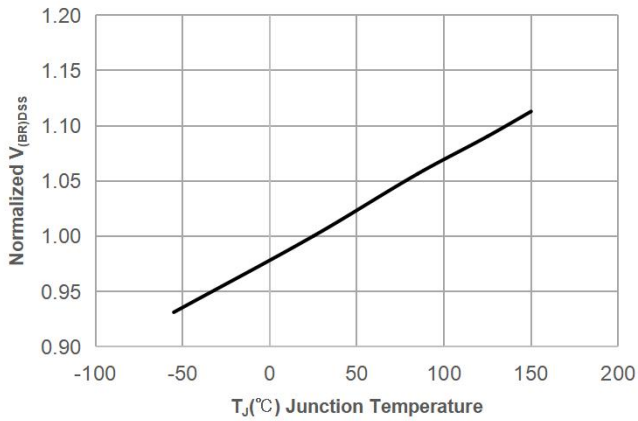


Figure 8: Normalized on Resistance vs. Junction Temperature

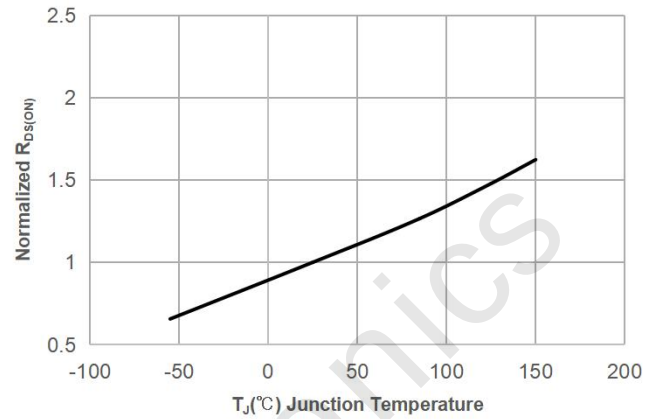


Figure 9: Maximum Safe Operating Area

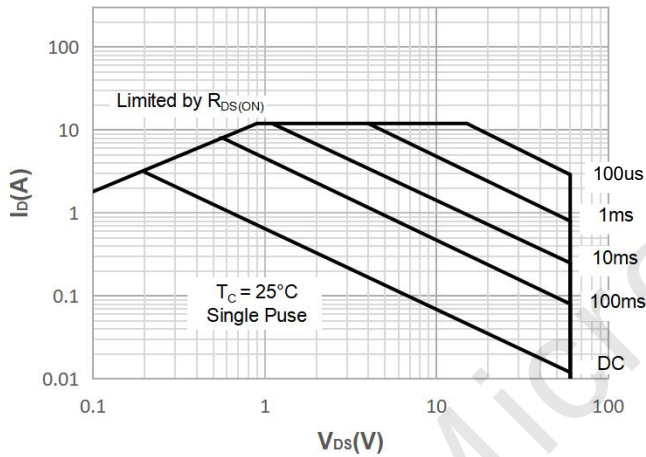


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

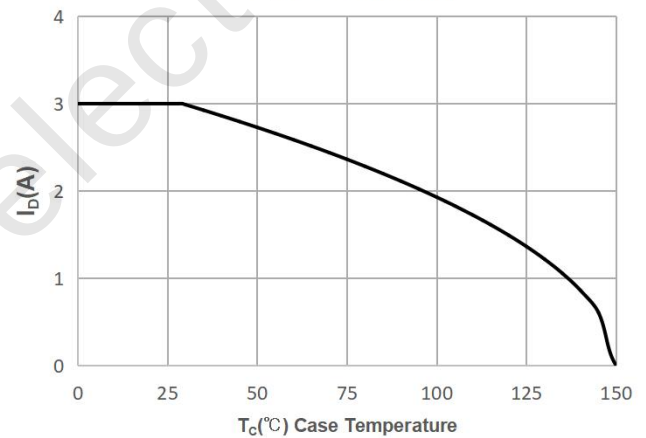


Figure 11: Normalized Maximum Transient Thermal Impedance

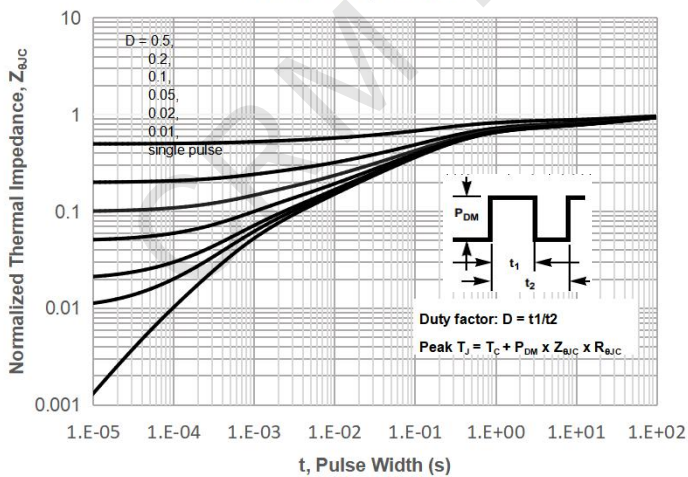
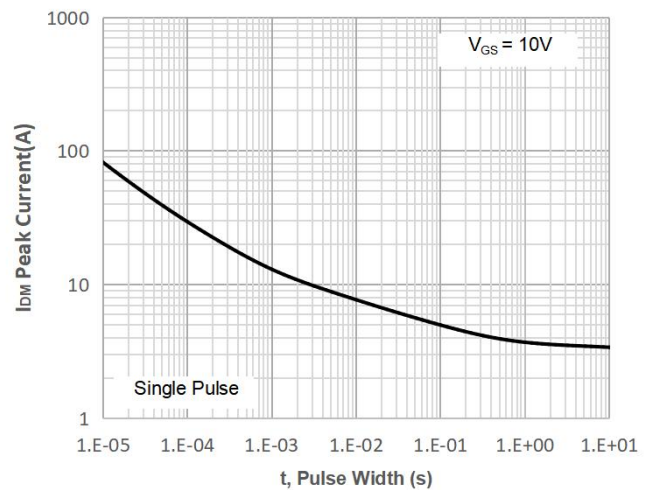


Figure 12: Peak Current Capacity



Test Circuit

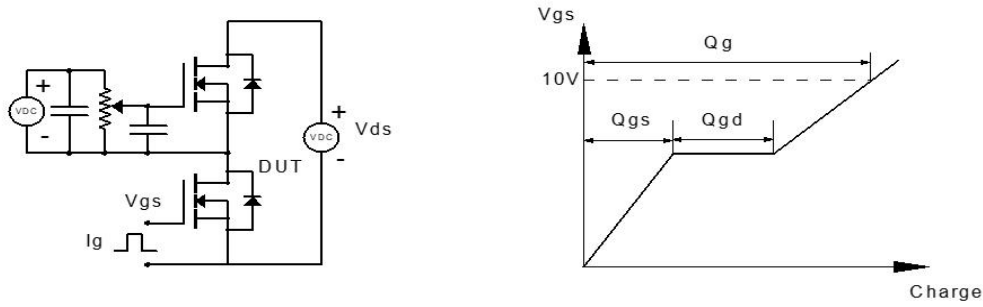


Figure 1: Gate Charge Test Circuit & Waveform

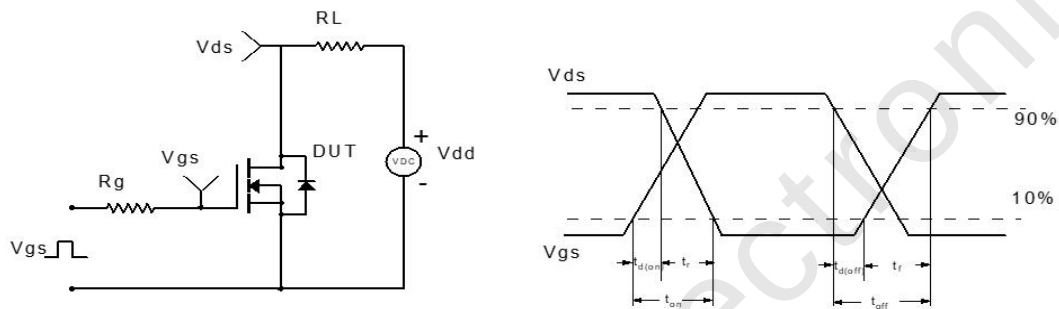


Figure 2: Resistive Switching Test Circuit & Waveform

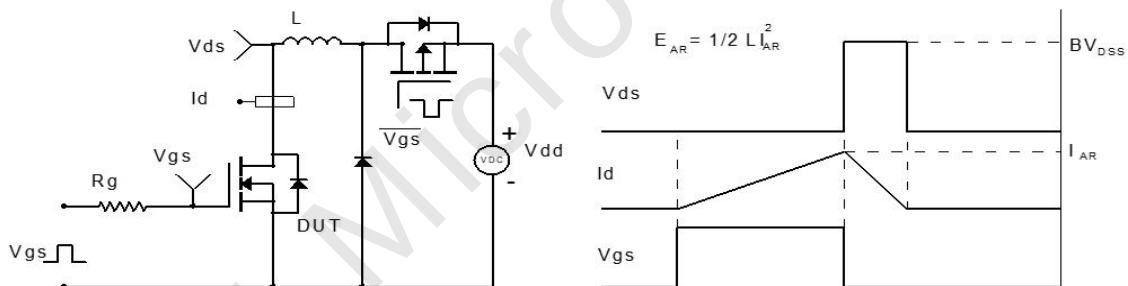


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

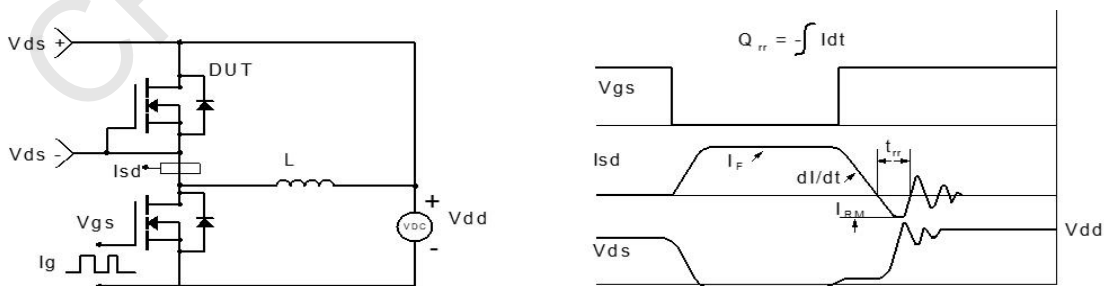
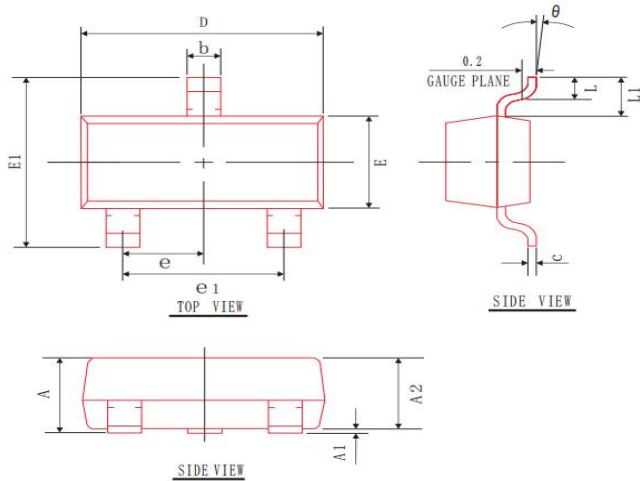


Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(SOT-23)



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.05	1.20
A1	0.00	0.05	0.10
A2	0.90	1.00	1.10
b	0.30	0.40	0.50
c	0.08	0.10	0.15
D	2.80	2.90	3.00
E	1.20	1.30	1.40
E1	2.30	2.40	2.50
L	0.30	0.40	0.50
θ	0°	5°	10°
L1	0.55 REF		
e	0.95 BSC		
e1	1.90 REF		

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