

Features

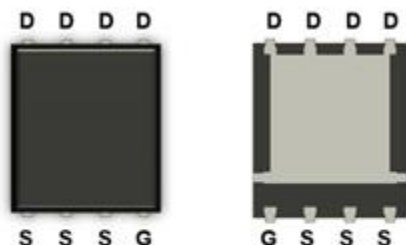
- Uses advanced SGT technology
- Extremely low $R_{DS(on)}_{typ}=4.8m\Omega@V_{GS}=10V$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)

Application

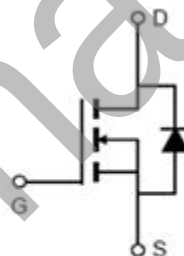
- Motor Drives
- SR (Synchronous Rectification)
- DC/DC converter
- General purpose applications

Product Summary

V_{DS}	80V
$R_{DS(on)}@V_{GS}=10V$	4.8mΩ
I_D	90A



DFN56



Package Marking and Ordering Information

Type	Package	Marking	Reel Size	Tape Width	Qty
LR055N08SA8	DFN5X6	LR055N08SA8	330*16.5mm	12mm	5000

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	80	V
Continuous drain current $T_C = 25^\circ C$ (Silicon limit) $T_C = 25^\circ C$ (Package limit) $T_C = 100^\circ C$ (Silicon limit)	I_D	135 90 86	A
Pulsed drain current $T_C = 25^\circ C$, t_p limited by T_{jmax}	$I_{D \text{ pulse}}$	480	
Avalanche energy, single pulse ($L=0.5mH, R_g=25\Omega$)	E_{AS}	560	mJ
Gate-Source voltage	V_{GS}	± 20	V
Power dissipation $T_C = 25^\circ C$	P_D	220	W
Operating junction and storage temperature	T_j, T_{stg}	-55~155	$^\circ C$

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	0.70	°C/W
Thermal resistance, junction – ambient. Max	R_{thJA}	60	

Electrical Characteristic, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	80	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$ $T_j=25^{\circ}C$	2.0	2.9	4.0	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$ $T_j=25^{\circ}C$	-	-	1	μA
		$V_{DS}=64V, V_{GS}=0V$ $T_j=125^{\circ}C$	-	-	10	
Gate-source leakage current	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=50A,$ $T_j=25^{\circ}C$	-	4.8	5.5	mΩ
Transconductance	g_{fs}	$V_{DS}=5V, I_D=50A$	-	80	-	S

Dynamic Characteristic

Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=40V,$ $f=1MHz$	-	4032	-	pF
Output Capacitance	C_{oss}		-	546	-	
Reverse Transfer Capacitance	C_{rss}		-	35	-	
Gate Total Charge	Q_G	$V_{GS}=10V, V_{DS}=40V,$ $I_D=25A$	-	65.7	-	nC
Gate-Source charge	Q_{gs}		-	24.9	-	
Gate-Drain charge	Q_{gd}		-	13.9	-	
Turn-on delay time	$t_{d(on)}$	$T_j=25^\circ C, V_{GS}=10V,$ $V_{DS}=40V, R_L=3\Omega$	-	20.1	-	ns
Rise time	t_r		-	38	-	
Turn-off delay time	$t_{d(off)}$		-	45.1	-	
Fall time	t_f		-	21	-	
Gate resistance	R_G	$V_{GS}=0V, V_{DS}=0V,$ $f=1MHz$	-	1.6	-	Ω

Body Diode Characteristic

Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=50A$	-	0.85	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F=20A,$ $dI/dt=500A/\mu s$	-	61	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=20A,$ $dI/dt=500A/\mu s$	-	340	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

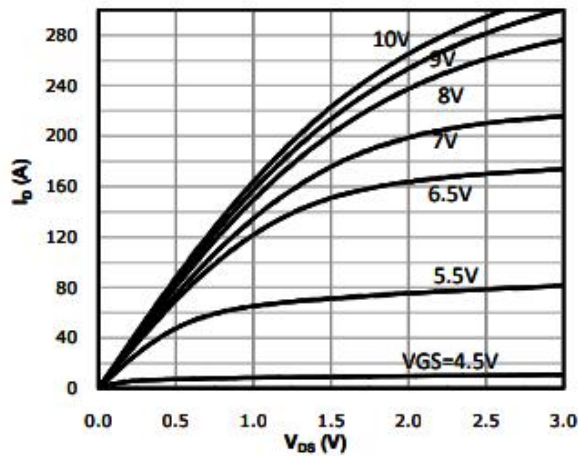


Fig 2: Transfer Characteristics

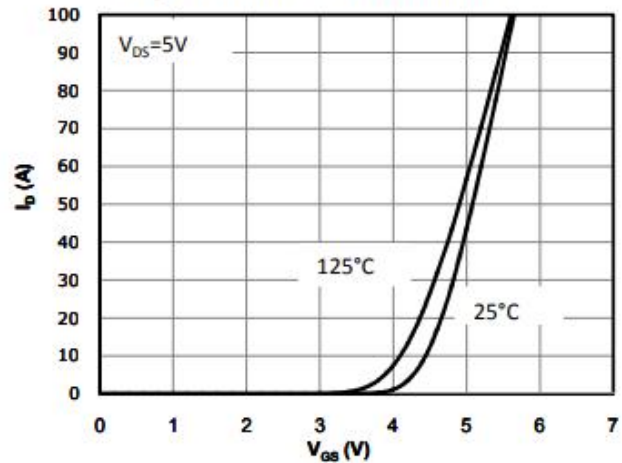


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

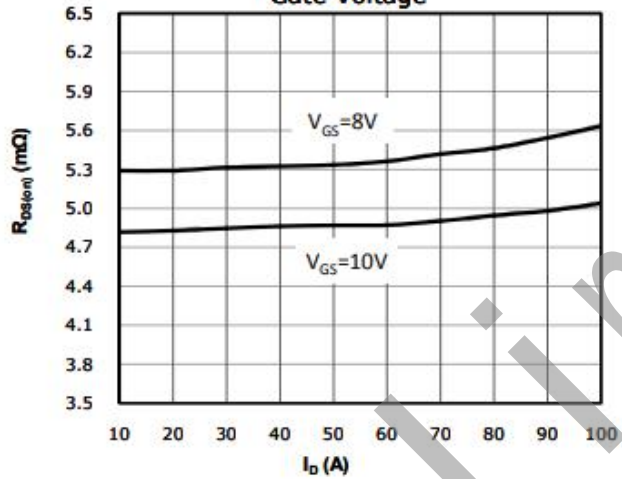


Fig 4: $R_{DS(on)}$ vs Gate Voltage

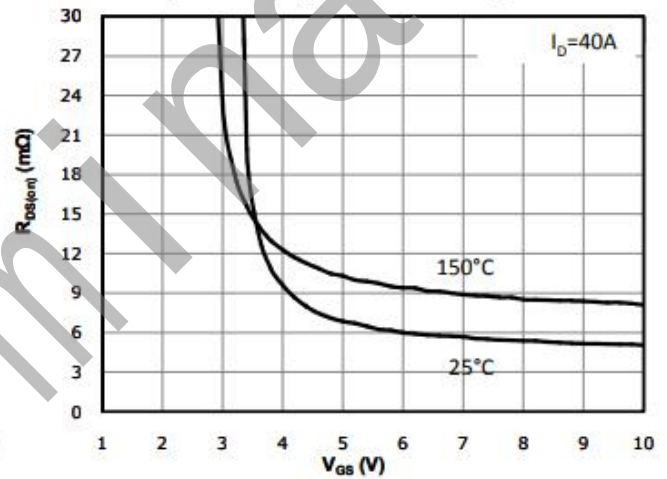


Fig 5: $R_{DS(on)}$ vs. Temperature

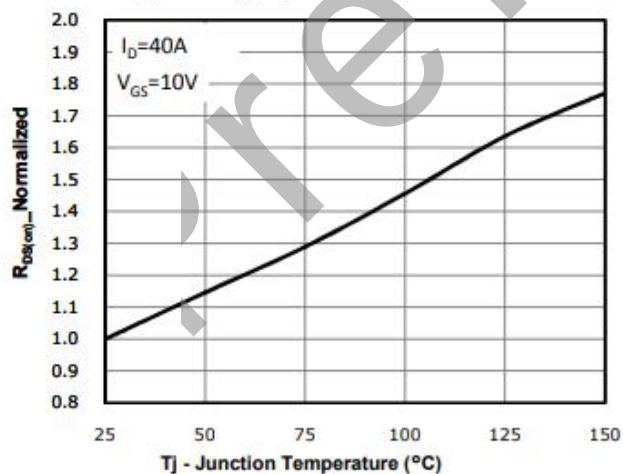


Fig 6: Capacitance Characteristics

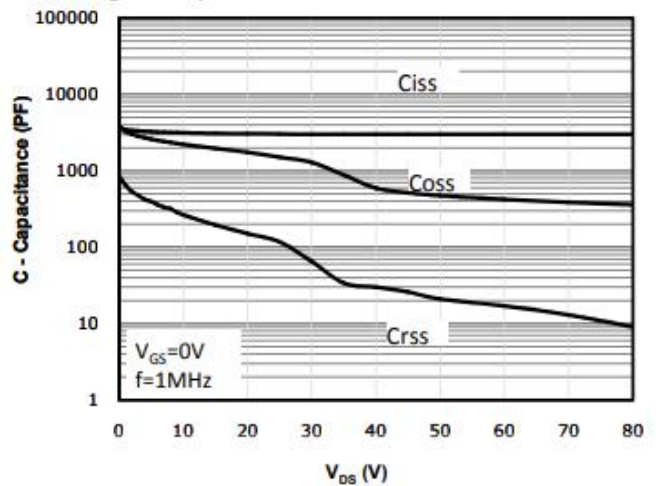


Fig 7: Gate Charge Characteristics

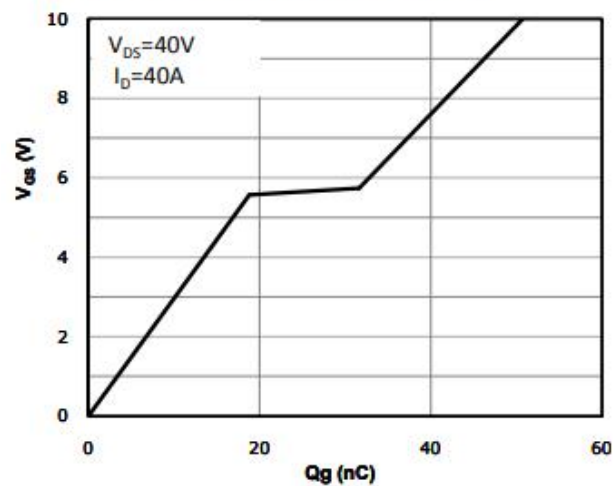


Fig 8: Body-diode Forward Characteristics

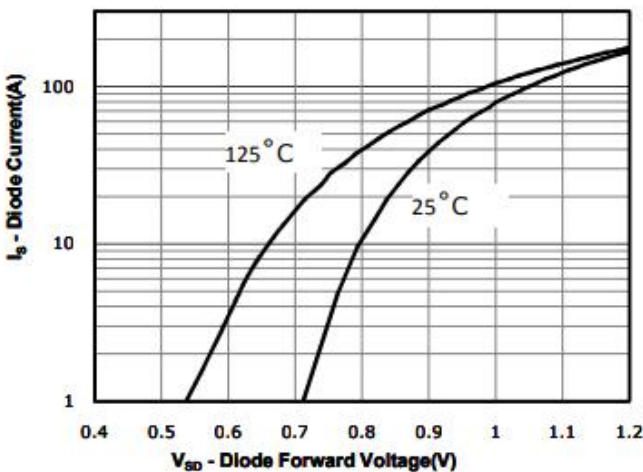


Fig 9: Power Dissipation

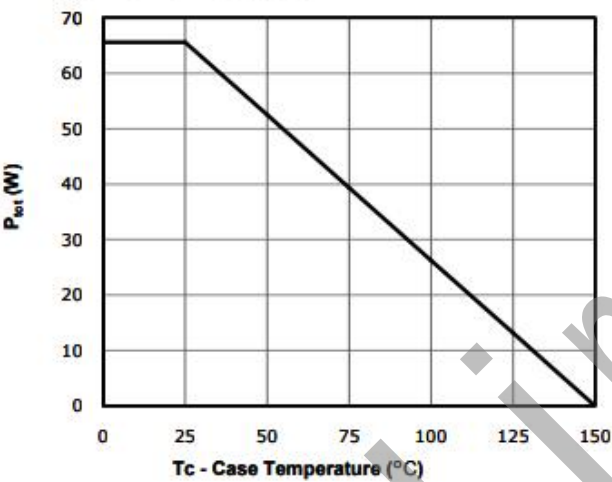


Fig 10: Drain Current Derating

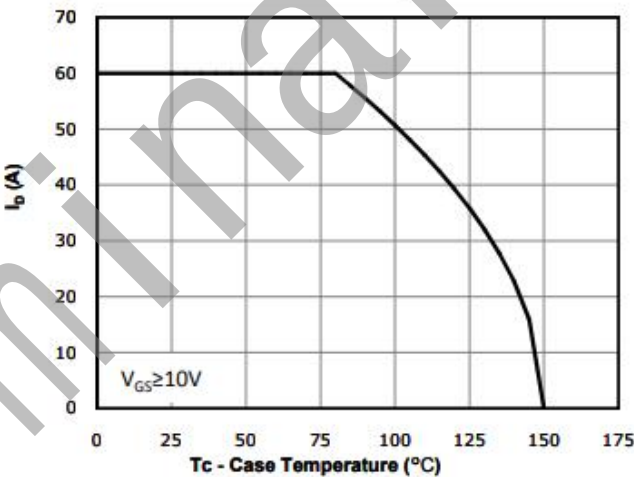


Fig 11: Safe Operating Area

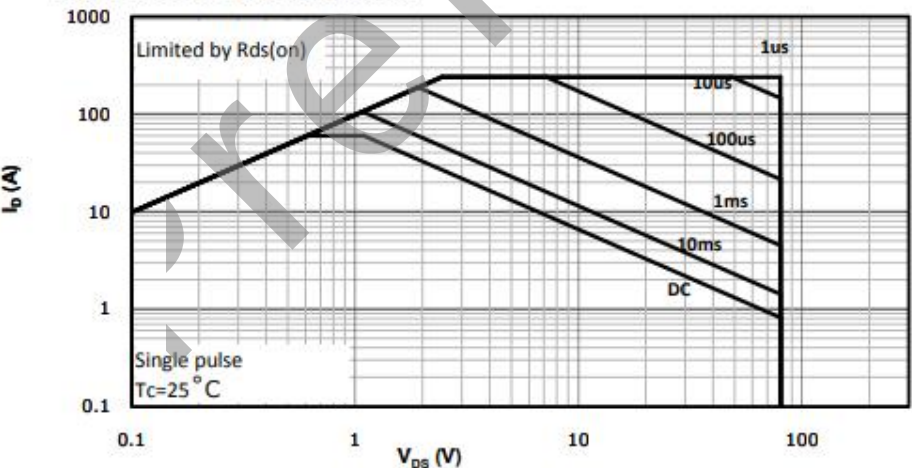
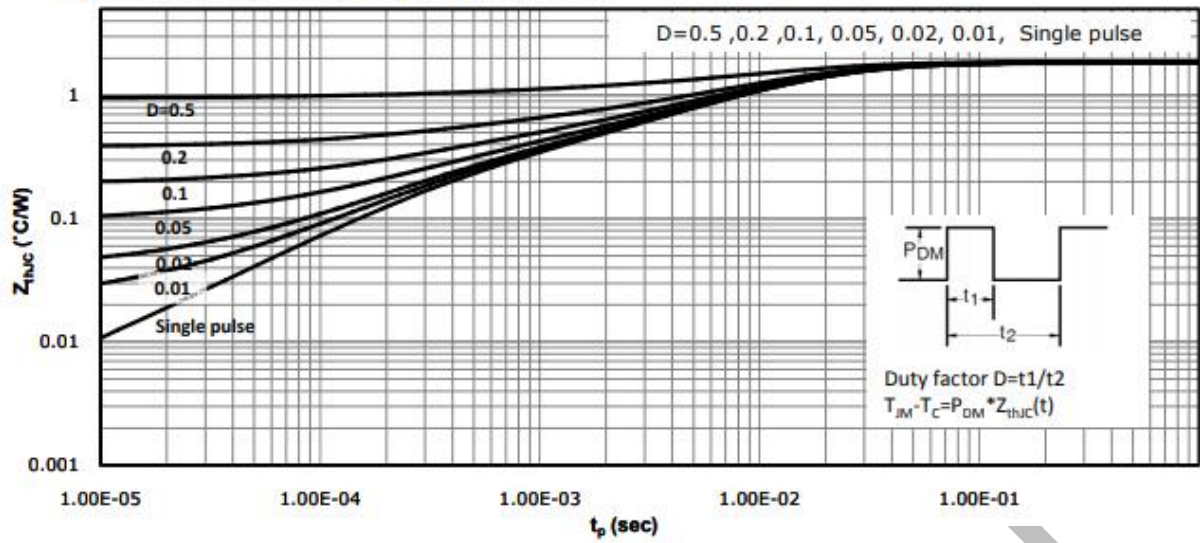
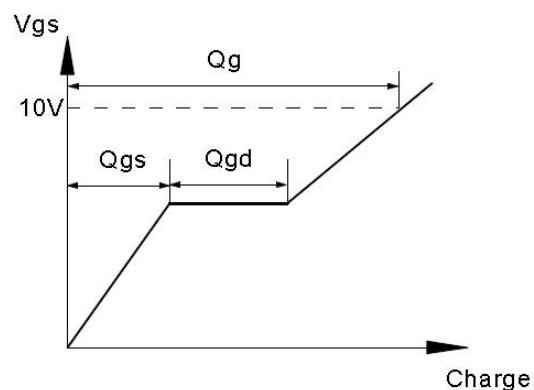
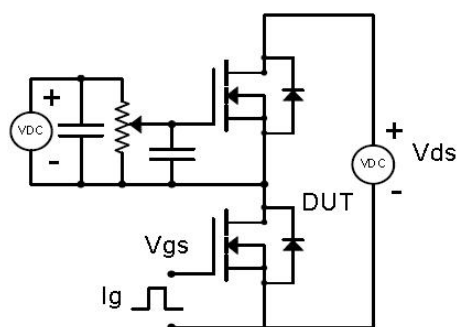


Fig 12: Max. Transient Thermal Impedance

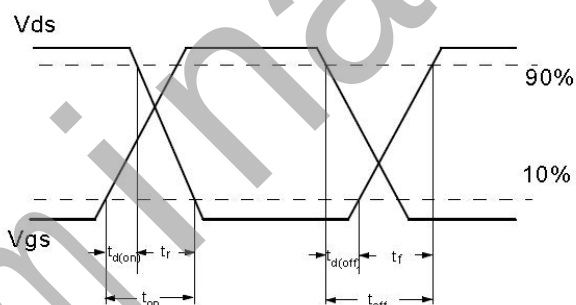
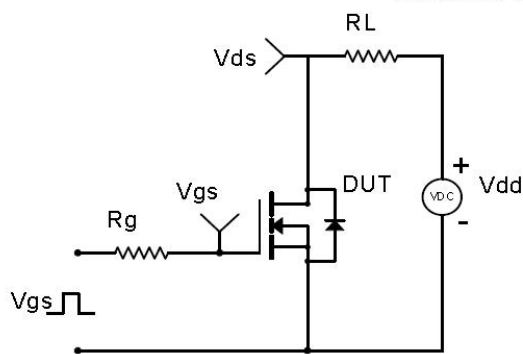


Test Circuit & Waveform

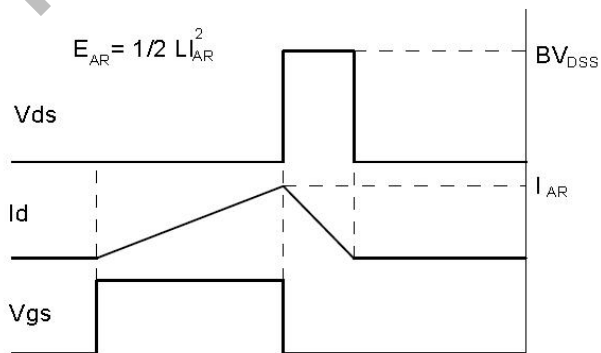
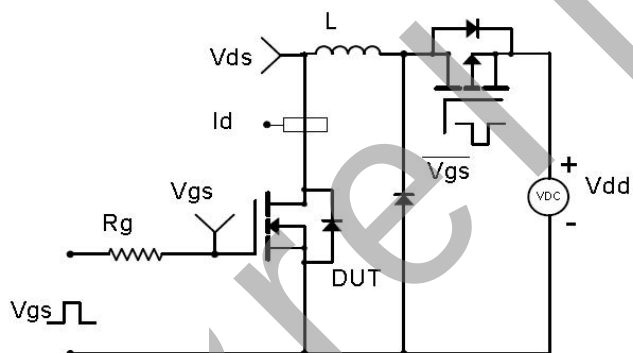
Gate Charge Test Circuit & Waveform



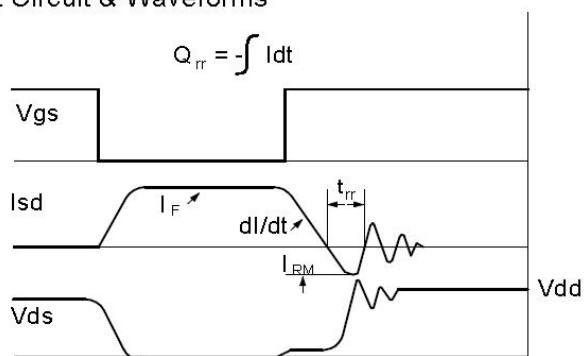
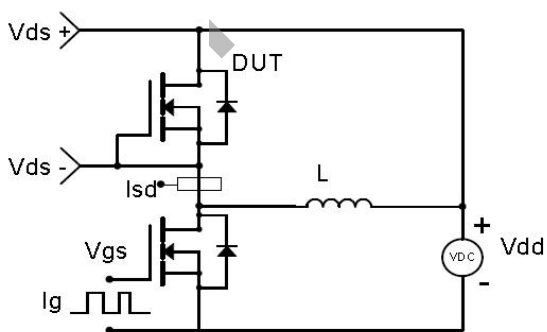
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Revision History

Revision	Date	Major changes
0.0	2020/9/18	Preliminary Revision
0.1	2021/5/8	Change product name,Former name: LM90N08S8
1.0	2022/4/28	Change product name,Former name: LM90N08SA8

preliminary