

Features

- Uses advanced SGT technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)

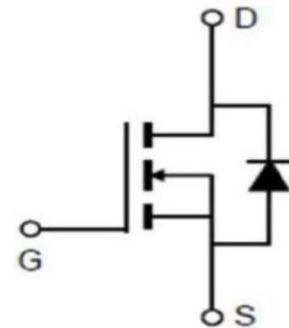
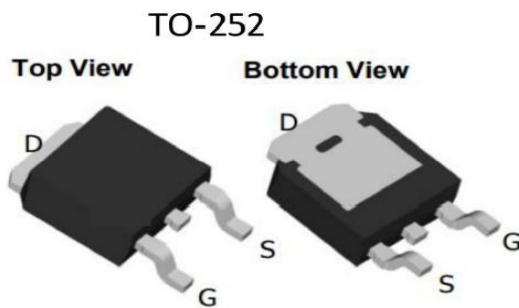
Application

- Motor control and drive
- Battery management
- DC/DC

Product Summary

Package	TO-252
V_{DS}	60V
$R_{DS(on)}@V_{GS}=10V$	3.96mΩ
I_D	106A

Package Marking



Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
LR045N06SML4	TO-252	LR045N06SML4	330*20.5mm	16mm	Reel&Tape	2500

Maximum Ratings (TC=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous drain current $T_c=25^\circ\text{C}$ (Silicon limit) $T_c=100^\circ\text{C}$ (Silicon limit)	I_D	106 67	A
Pulsed Drain Current	I_{DM}	360	A
Maximum Power Dissipation	P_d	96	W
Single pulse avalanche energy	E_{AS}	225	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance,Junction-to-Case	R_{thJC}	1.3	°C/W
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Electrical Characteristics (T_C=25°C unless otherwise noted)

Parameter	Symbol	Condition	min	typ	max	Unit
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Static Characteristic

Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60	67	-	V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.85	2.5	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	±100	nA
Drain-source on-state resistance	$R_{DS(on)}$	$I_D=30A, V_{GS}=10V$	-	3.96	4.5	mΩ
		$I_D=15A, V_{GS}=4.5V$	-	5.2	6.1	
Forward Transconductance	g_{fs}	$V_{DD}=10V, I_D=60A$	40	-	-	S

Dynamic Characteristic

Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V,$ $f=1MHz$	-	2273	-	pF
Output Capacitance	C_{oss}		-	424	-	
Reverse Transfer Capacitance	C_{rss}		-	15	-	
Gate resistance	R_g	$V_{DS}=0V, f=1MHz$	-	1.45	-	Ω
Gate Total Charge	Q_G	$V_{DS}=30V, I_D=60A,$ $V_{GS}=10V$	-	67	-	nC
Gate-Source charge	Q_{gs}		-	12	-	
Gate-Drain charge	Q_{gd}		-	9	-	
Turn-on delay time	$t_{d(on)}$	$V_{GS}=10V, V_{DS}=30V,$ $R_G=3\Omega$	-	11	-	ns
Rise time	t_r		-	5	-	
Turn-off delay time	$t_{d(off)}$		-	56	-	
Fall time	t_f		-	12	-	

Body Diode Characteristic

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=40A$	-	0.87	1.2	v
Reverse Recovery Time	t_{rr}	$I_F = 20A$ $di/dt = 100A/\mu s$	-	48	-	ns
Reverse Recovery Charge	Q_{rr}		-	60	-	nC

Typical Performance Characteristics

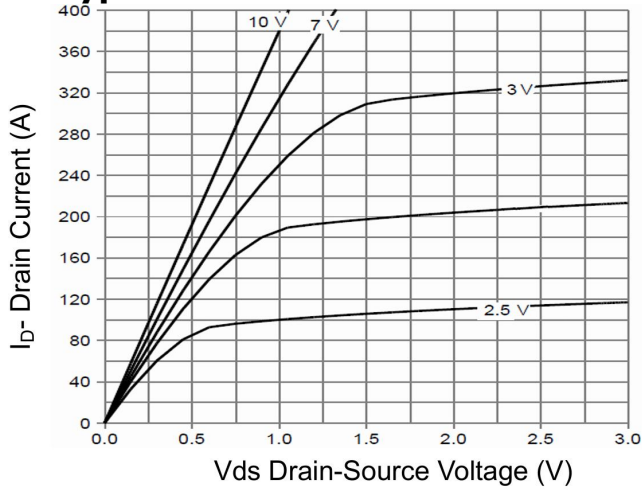


Figure 1 Output Characteristics

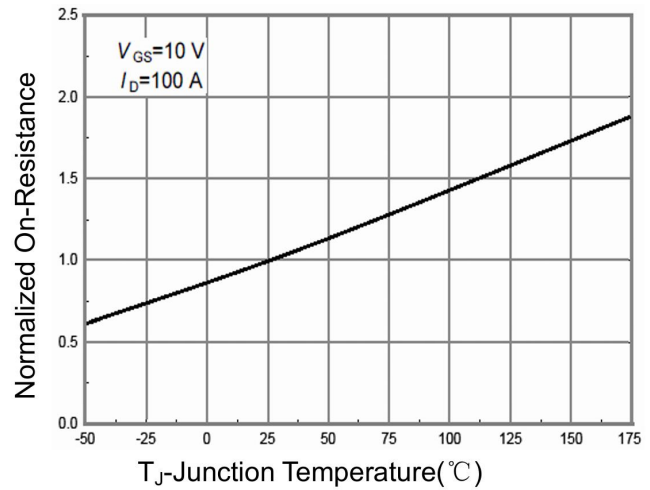


Figure 4 $R_{DS(on)}$ -Junction Temperature

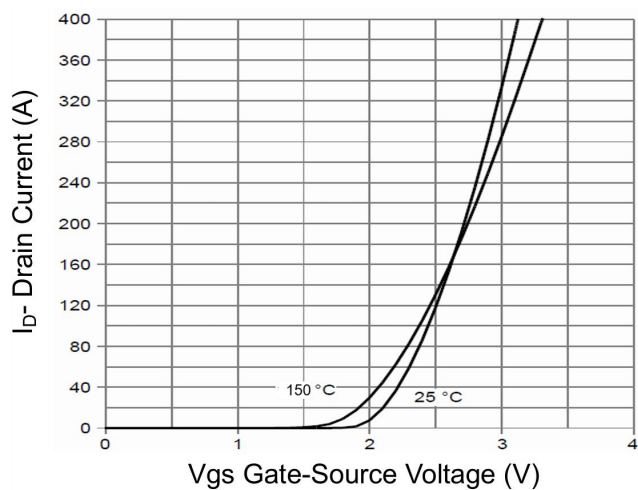


Figure 2 Transfer Characteristics

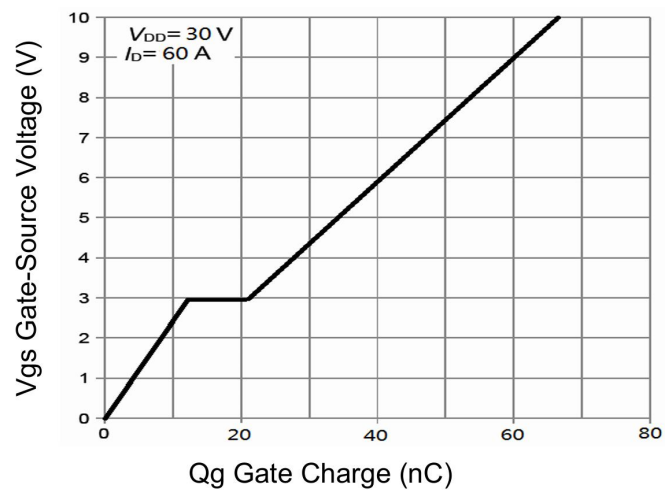


Figure 5 Gate Charge

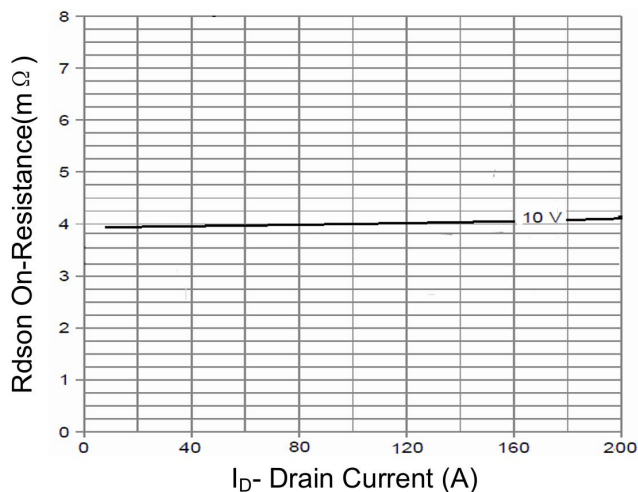


Figure 3 $R_{DS(on)}$ - Drain Current

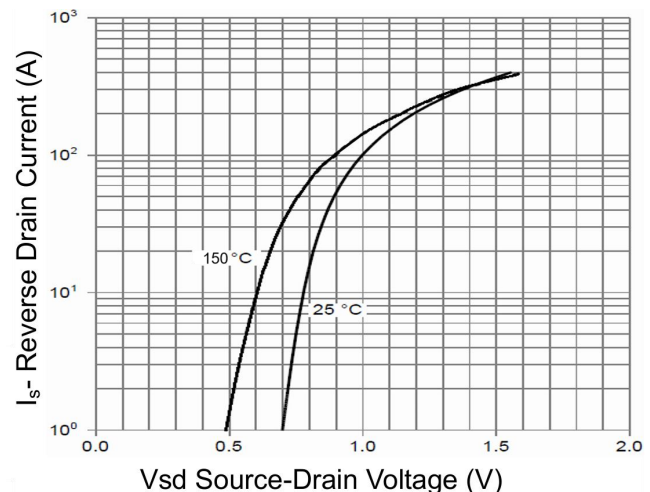
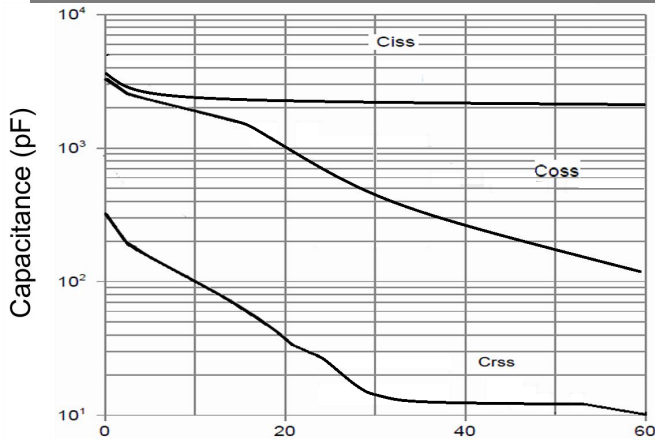
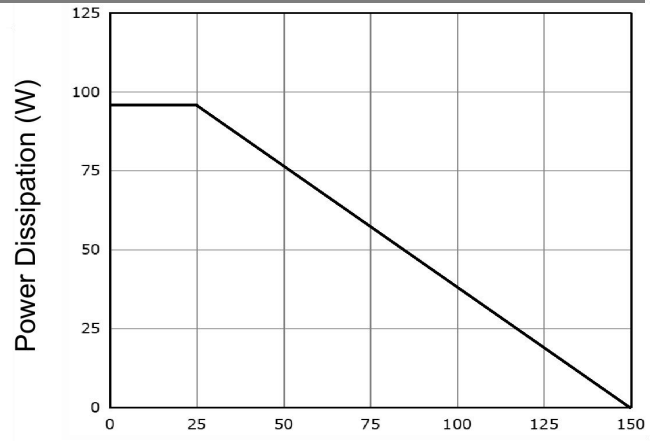


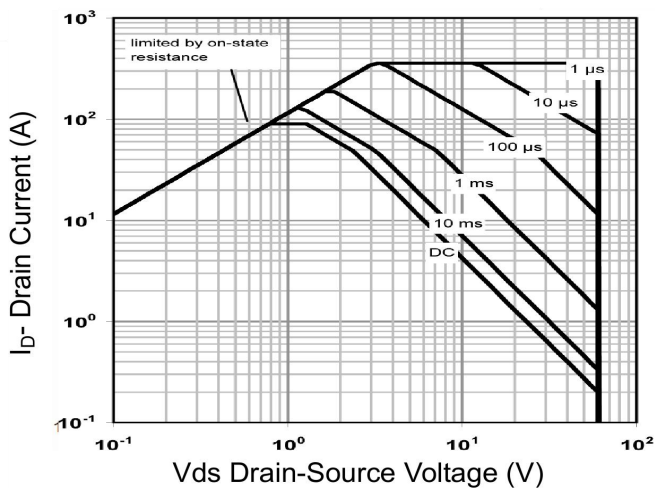
Figure 6 Source- Drain Diode Forward



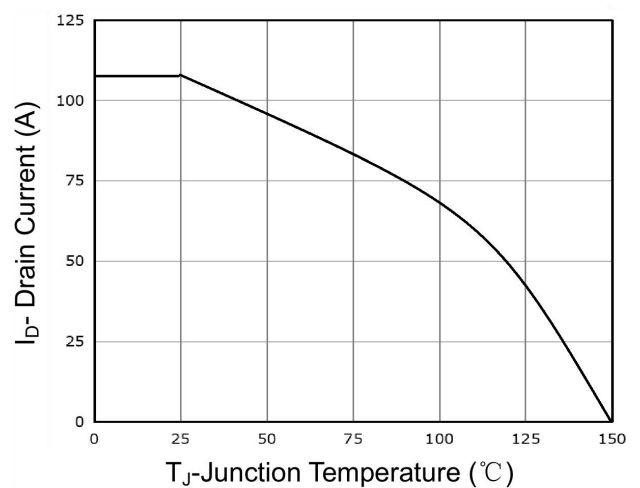
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



TJ-Junction Temperature(°C)
Figure 9 Power De-rating



Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area



TJ-Junction Temperature (°C)
Figure 10 Current De-rating

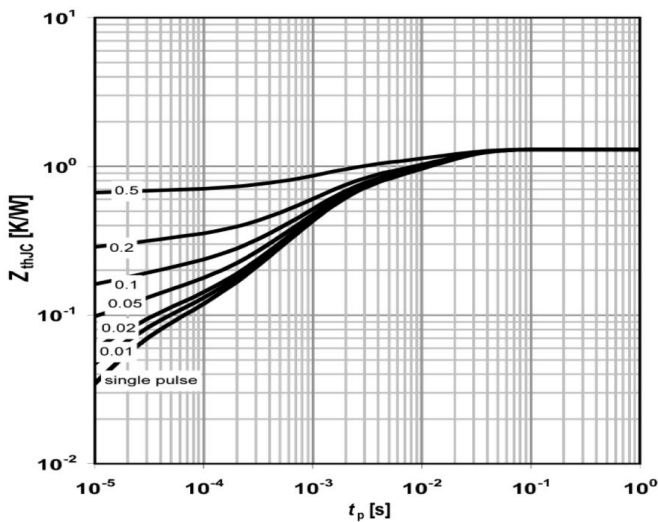
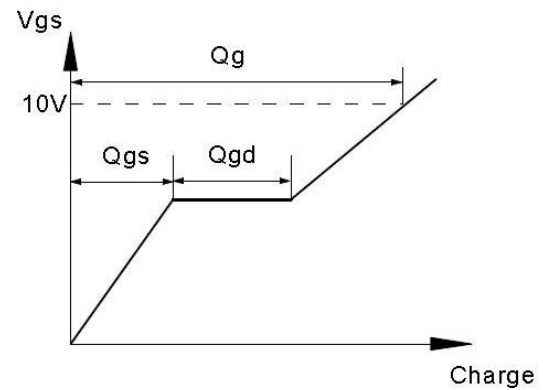
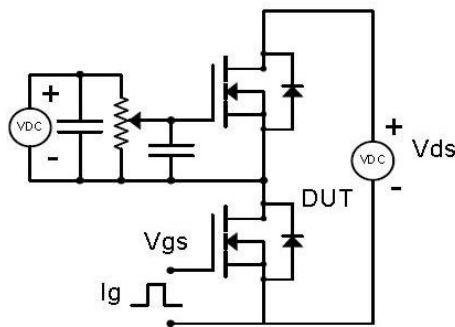


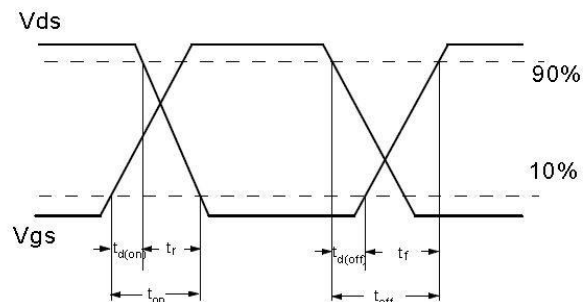
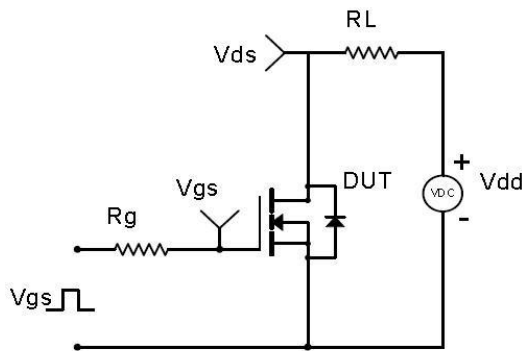
Figure 11 Max Transient Thermal Impedance

Test Circuit & Waveform

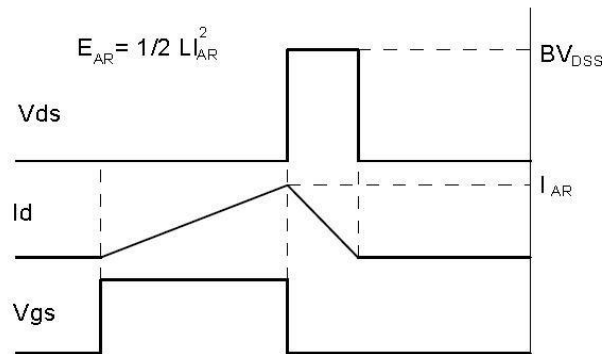
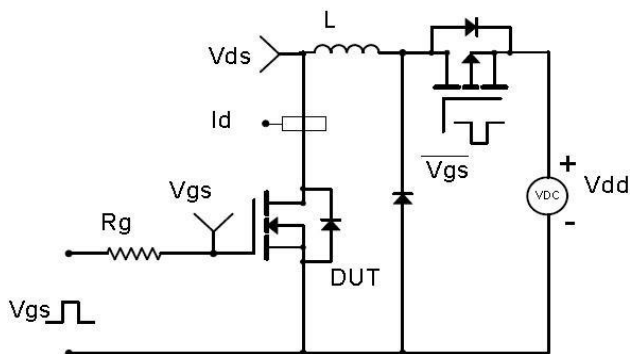
Gate Charge Test Circuit & Waveform



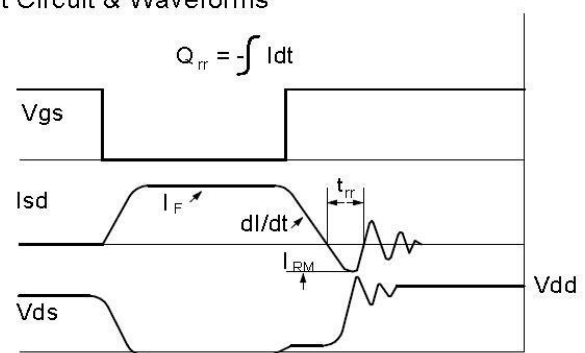
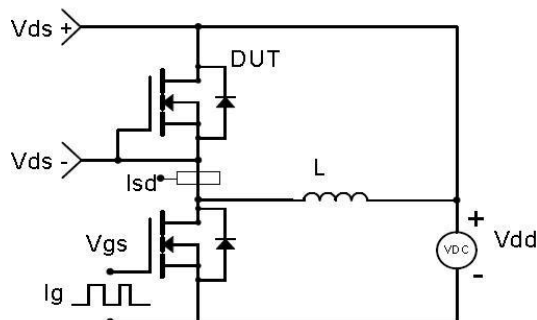
Resistive Switching Test Circuit & Waveforms



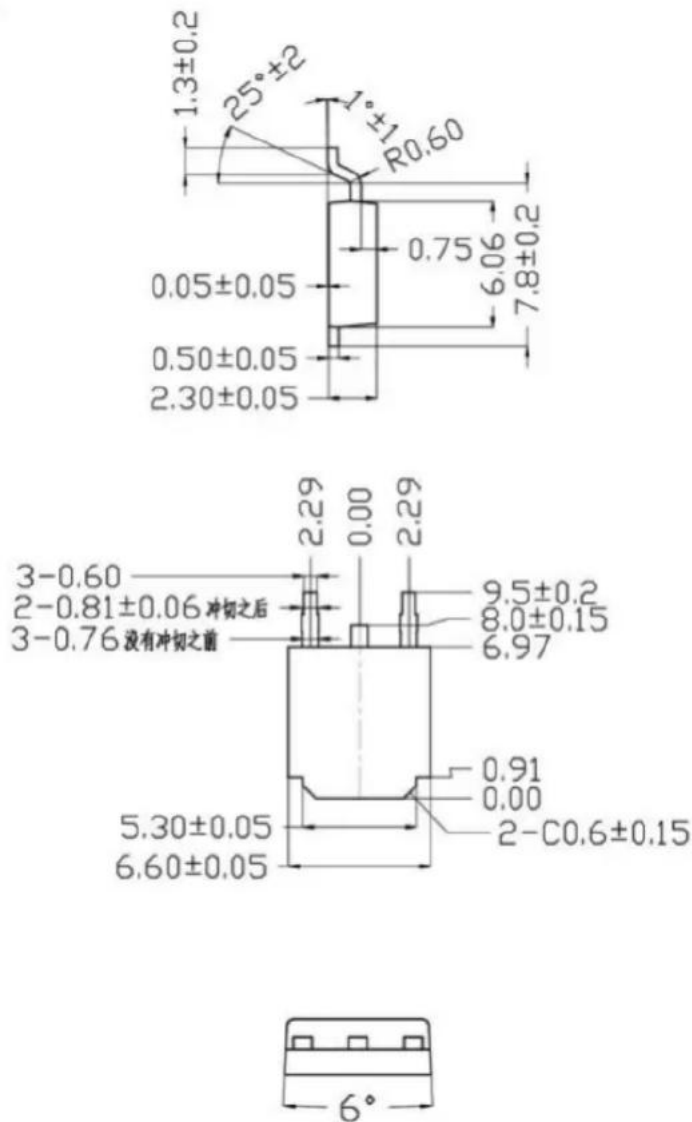
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline:TO-252



Revision History:

Revision	Date	Major changes
1.0	2025/8/8	Release of Preliminary version.