

Features

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- $R_{DS(on).typ}=4.3m\Omega@V_{GS}=10V$
- High Reliability Capability

Application

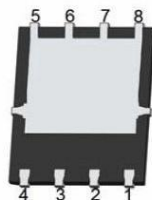
- Charger
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Product Summary

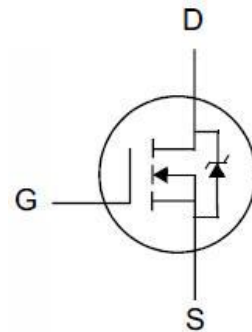
V_{DS}	100V
$R_{DS(on).typ}@V_{GS}=10V$	4.3mΩ
I_D	110A



Top View



Bottom View



Package Marking and Ordering Information

Type	Package	Marking	Reel Size	Qty
LR048N10SM8	PDFN56	LR048N10SM8	-	5000

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source Voltage	V_{DS}	100	V
Continuous Drain Current $T_C = 25^\circ C$ $T_C = 100^\circ C$	I_D	110 78	A
Pulsed Drain Current	$I_{D \text{ pulse}}$	440	A
Avalanche Energy, Single Pulse	E_{AS}	613	mJ
Gate-emitter Voltage	V_{GS}	±20	V
Power Dissipation, $T_C = 25^\circ C$	P_D	104	W
Operating Junction And Storage Temperature	T_j, T_{stg}	-55~150	°C

Thermal Resistance

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance, Junction to Case	R_{thJC}	-	1.2	°C/W
Thermal Resistance, Junction to Ambient	R_{thJA}	-	45	°C/W

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

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Drain-source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	105	107	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain-source on-state Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=50A$	-	4.3	4.8	m Ω

Dynamic Characteristic

Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=40V,$ $f=1MHz$	-	4633	-	pF
Output Capacitance	C_{oss}		-	946	-	
Reverse Transfer Capacitance	C_{rss}		-	24	-	
Gate Total Charge	Q_g	$V_{GS}=10V,$ $V_{DS}=40V,$ $I_D=20A$	-	78	-	nC
Gate-Source charge	Q_{gs}		-	20	-	
Gate-Drain charge	Q_{gd}		-	30	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V,$ $V_{DD}=50V,$ $I_D=20A,$ $R_G=3\Omega$	-	18	-	ns
Turn-on Rise Time	t_r		-	66	-	
Turn-off Delay Time	$t_{d(off)}$		-	68	-	
Turn-off Fall Time	t_f		-	50	-	

Body Diode Characteristic

Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=20A$	-	-	1.2	V
Reverse Recovery Time	t_{rr}	$I_F=20A,$	-	60	-	ns
Reverse Recovery Charge	Q_{rr}	$dI_F/dt=100A/us$	-	111	-	nC

Typical Performance Characteristics

Figure 1: Power Dissipation

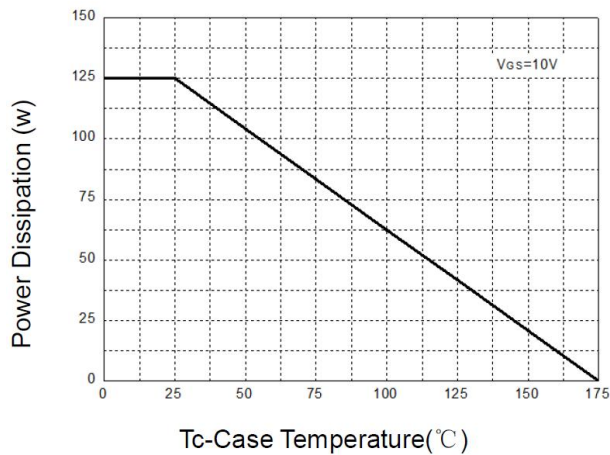


Figure 2: Drain Current

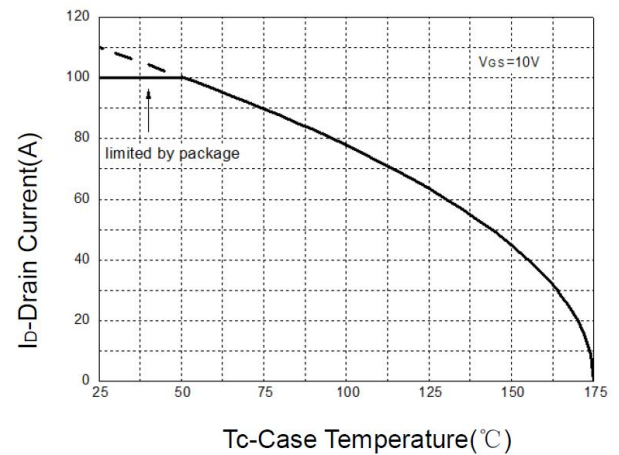


Figure 3: Safe Operation Area

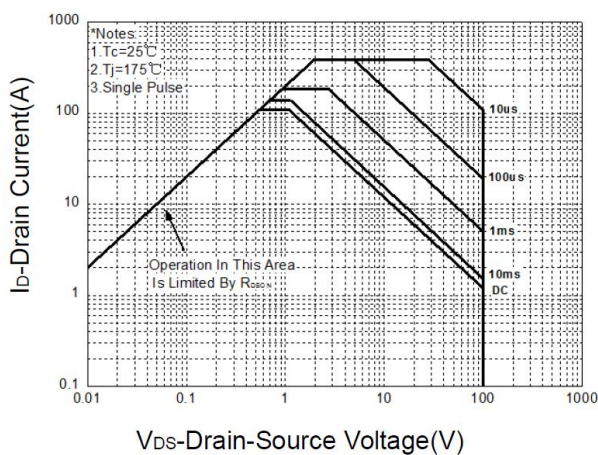


Figure 4: Thermal Transient Impedance

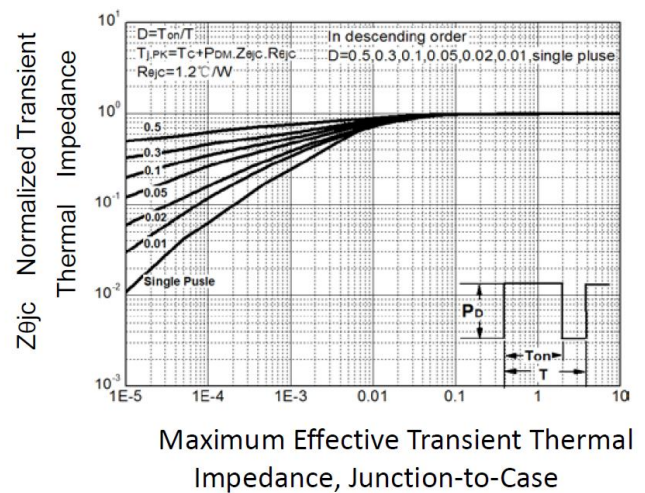


Figure 5: Output Characteristics

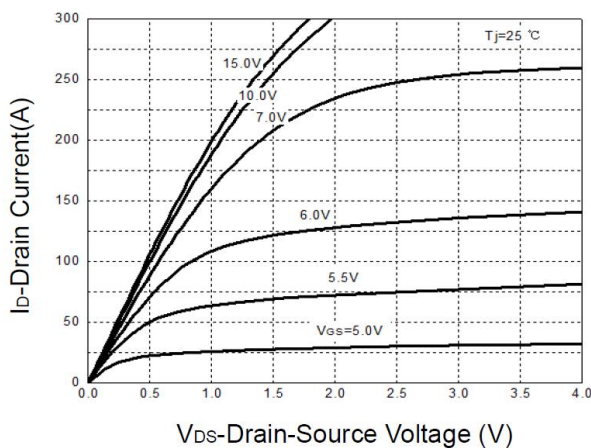


Figure 6: Drain-Source On Resistance

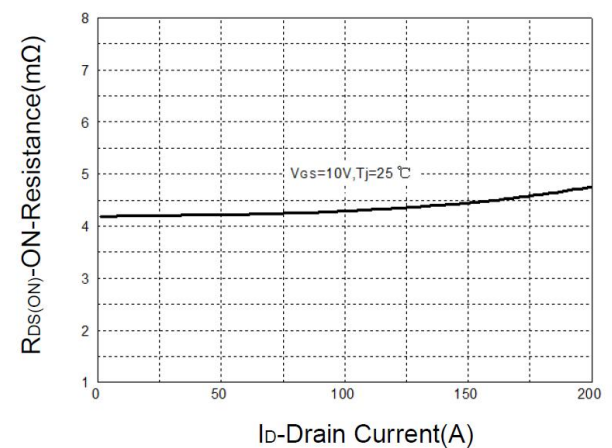


Figure 7: On-Resistance vs. Temperature

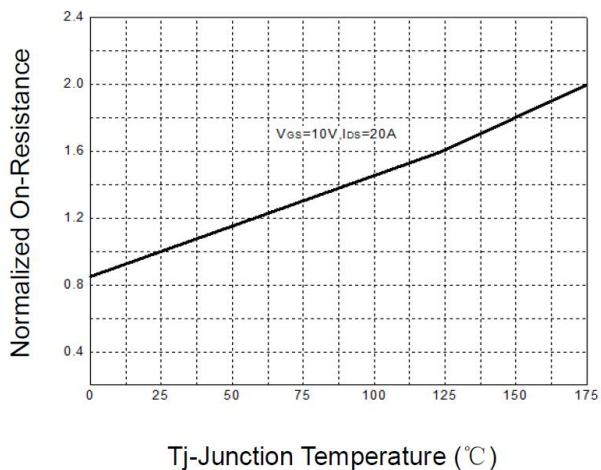


Figure 8: Source-Drain Diode Forward

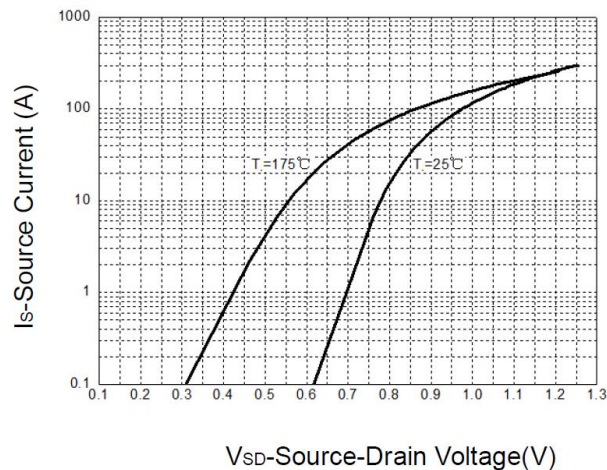


Figure 9: Capacitance Characteristics

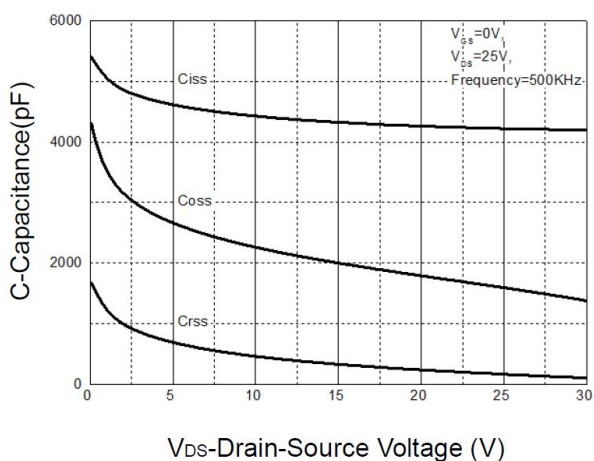
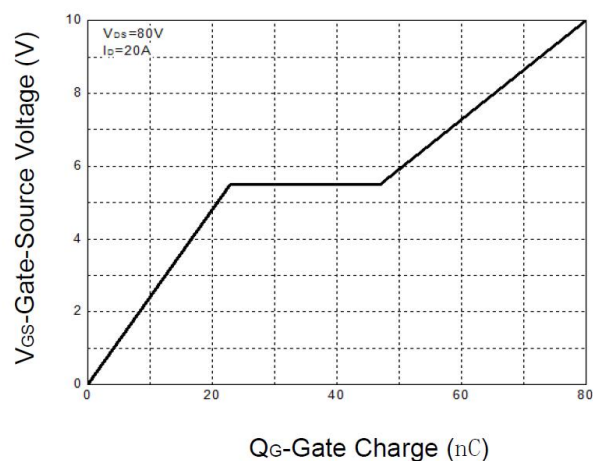
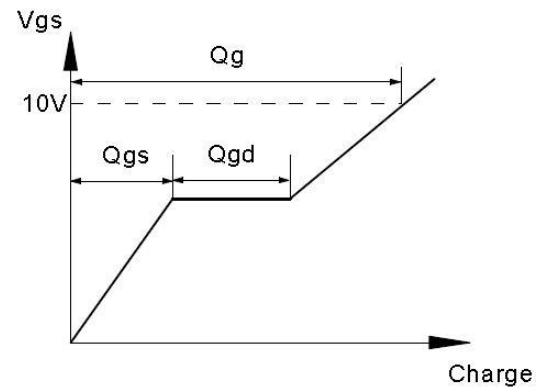
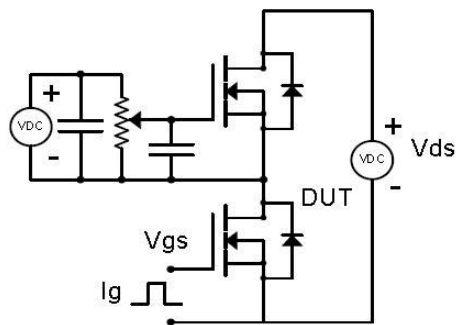


Figure 10: Gate Charge Characteristics

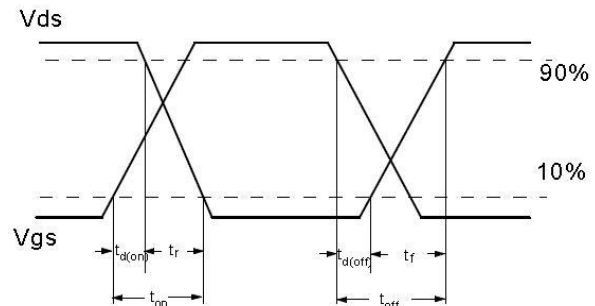
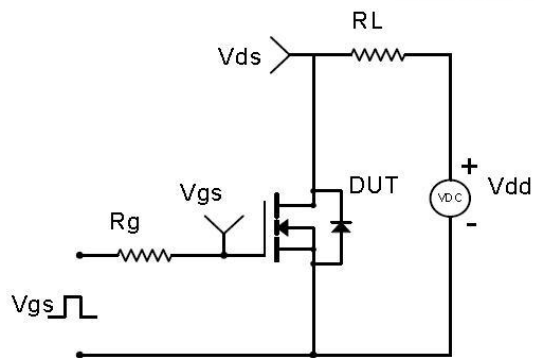


Test Circuit & Waveform

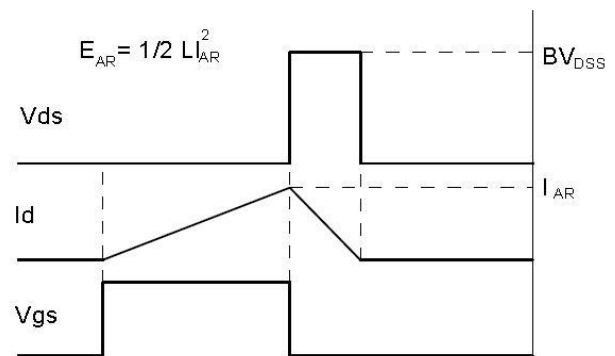
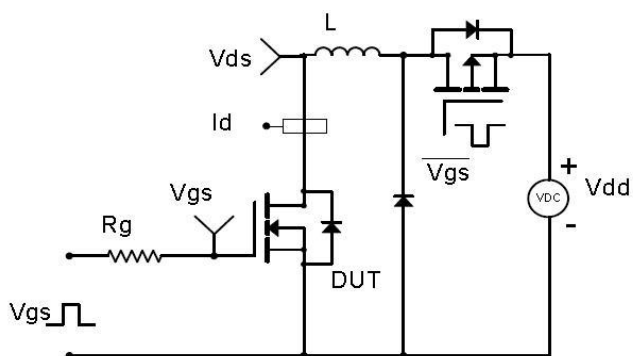
Gate Charge Test Circuit & Waveform



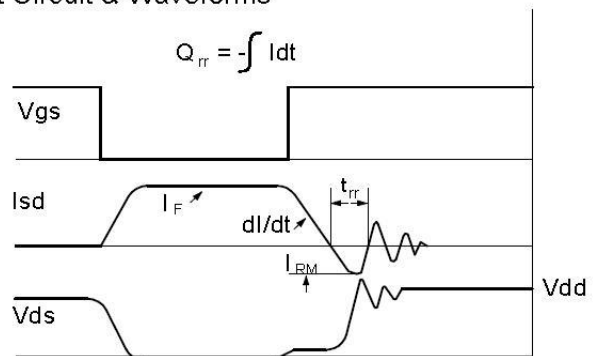
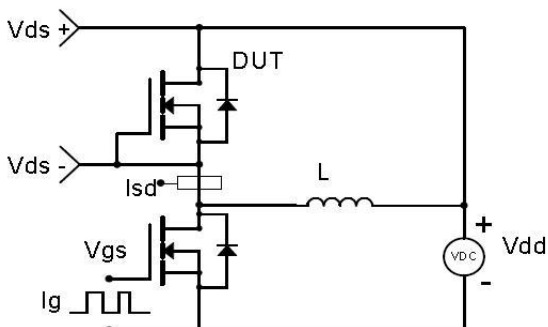
Resistive Switching Test Circuit & Waveforms



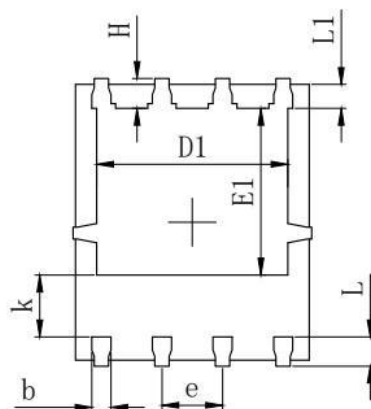
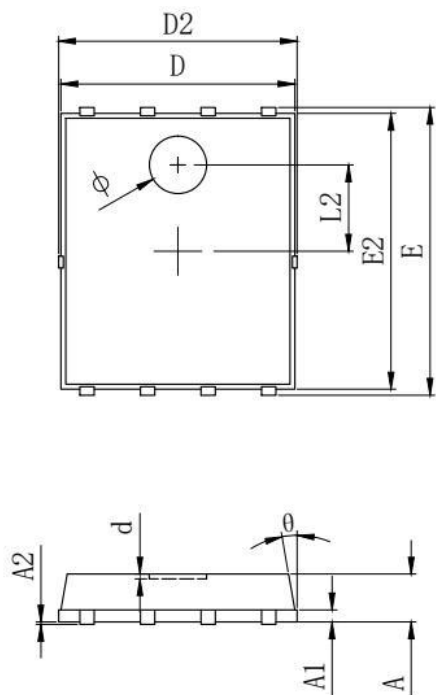
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: PDFN56



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	0.900	1.000	1.100
A1	0.254 REF.		
A2	0°0.05		
D	4.824	4.900	4.976
D1	3.910	4.010	4.110
D2	4.924	5.000	5.076
E	5.924	6.000	6.076
E1	3.375	3.475	3.575
E2	5.674	5.750	5.826
b	0.350	0.400	0.450
e	1.270 TYP.		
L	0.534	0.610	0.686
L1	0.424	0.500	0.576
L2	1.800 REF.		
k	1.190	1.290	1.390
H	0.549	0.625	0.701
θ	8°	10°	12°
Φ	1.100	1.200	1.300
d			0.100