LM-STL45N10F7AG

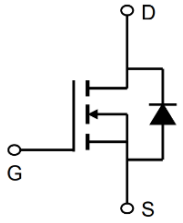
100V N-Channel Enhancement Mode MOSFET

Description

LM-STL45N10F7AG use advanced SGT MOSFET technology to provide low $R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness and suitable to use in

Inner Equivalent Principium Chart



Features

V_{DS} = 100V I_D =40A

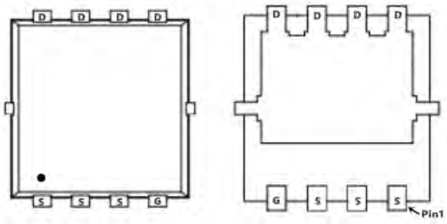
$R_{DS(ON)}$ <20mΩ @ V_{GS}=10V

Low RDS(on) & FOM

Extremely low switching loss

Excellent stability and uniformity or Invertors

Pin Assignment



Applications

- Consumer electronic power supply
- Motor control
- Synchronous-rectification
- Isolated DC
- Synchronous-rectification application

Package Marking and Ordering Information

Marking	Product ID	Pack	Qty(PCS)
APG40N10NF	LM-STL45N10F7AG	DFN5*6-8L	5000

Absolute Maximum Ratings at T_j=25℃ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	VDS	100	V
Gate source voltage	VGS	±20	V
Continuous drain current[1], T_C=25 ℃	ID	40	A
Pulsed drain current[2], T_C=25 ℃	ID, pulse	120	A
Power dissipation[3], T_C=25 ℃	P_D	72	W
Single pulsed avalanche energy[5]	EAS	30	mJ
Operation and storage temperature	Tstg，Tj	-55 to 150	℃
Thermal resistance, junction-case	RθJC	1.74	℃/W
Thermal resistance, junction-ambient[4]	RθJA	62	℃/W

Electrical Characteristics at T_j=25 ℃ unless otherwise specified

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=250 μA	100			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250 μA	1.0		2.5	V
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=10 V, I_D=8 A		16	20	mΩ
Drain-source on-state resistance	$R_{DS(ON)}$	V_{GS}=4.5 V, I_D=6 A			26	mΩ
Gate-source leakage current	I_{GSS}	V_{GS}=20 V			100	nA
					-100	
Drain-source leakage current	I_{DSS}	V_{DS}=100 V, V_{GS}=0 V			1	μA
Input capacitance	Ciss	V_{GS}=0 V, V_{DS}=50 V, f=1 MHz		1190.6		pF
Output capacitance	Coss			194.6		pF
Reverse transfer capacitance	Crss			4.1		pF
Turn-on delay time	td(on)	V_{GS}=10 V, V_{DS}=50 V, R_G=2.2 Ω, I_D=10 A		17.8		ns
Rise time	t_r			3.9		ns
Turn-off delay time	td(off)			33.5		ns
Fall time	t_f			3.2		ns
Total gate charge	Q_g	I_D=8 A, V_{DS}=50 V, V_{GS}=10 V		19.8		nC
Gate-source charge	Q_{gs}			2.4		nC
Gate-drain charge	Q_{gd}			5.3		nC
Gate plateau voltage	$V_{plateau}$			3.2		V
Diode forward current	I_S	V_{GS}<V_{th}			40	
Pulsed source current	I_{SP}				120	A
Diode forward voltage	V_{SD}	I_S=8 A, V_{GS}=0 V			1.3	V
Reverse recovery time	t_{rr}	I_S=8 A, di/dt=100 A/μs		50.2		ns
Reverse recovery charge	Q_{rr}			95.1		nC
Peak reverse recovery current	I_{rrm}			2.5		A

Note

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 ℃.
5) V_{DD}=50 V, R_G=25 Ω, L=0.3 mH, starting T_j=25 ℃.

Electrical Characteristics Diagrams

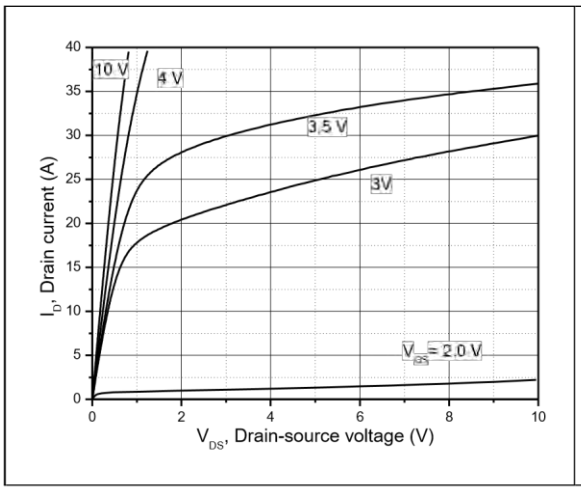


Figure 1, Typ. output characteristics

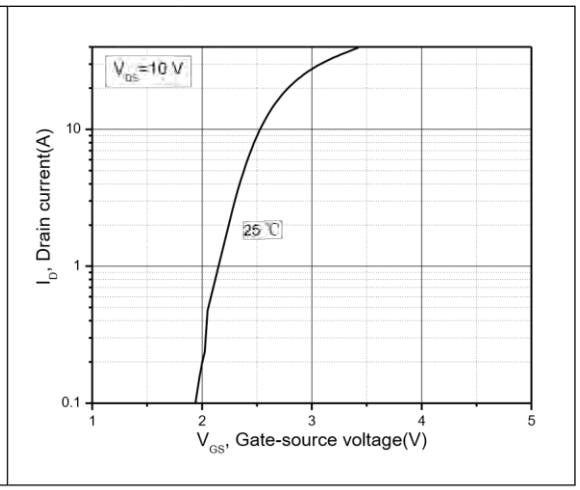


Figure 2, Typ. transfer characteristics

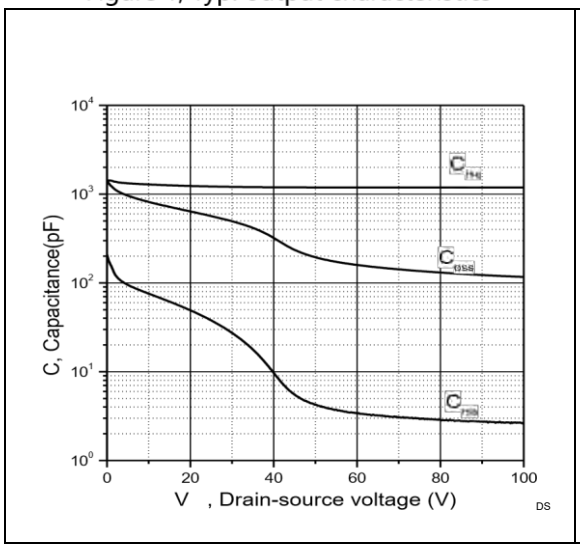


Figure 3, Typ. capacitances

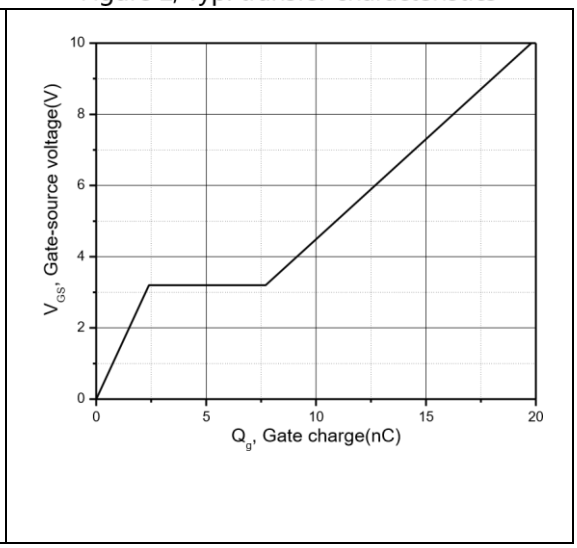


Figure 4, Typ. gate charge

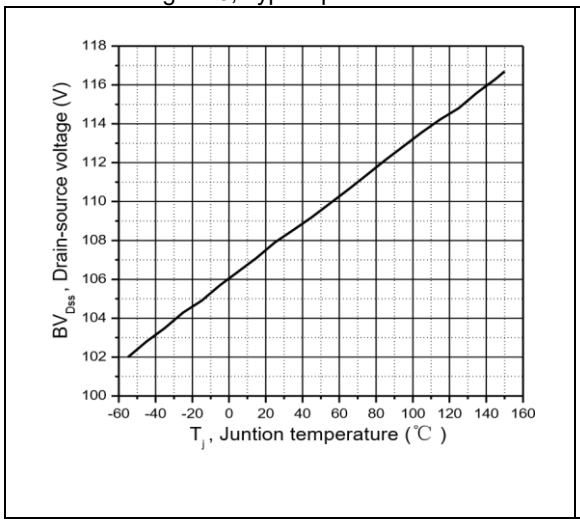


Figure 5, Drain-source breakdown voltage

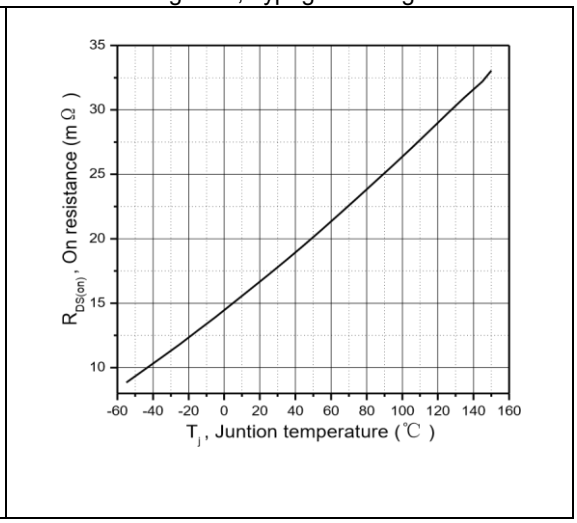


Figure 6, Drain-source on-state resistance

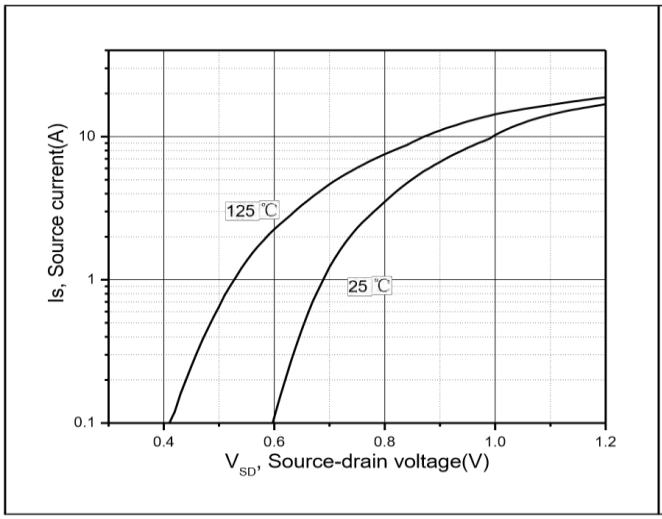


Figure 7, Forward characteristic of body diode

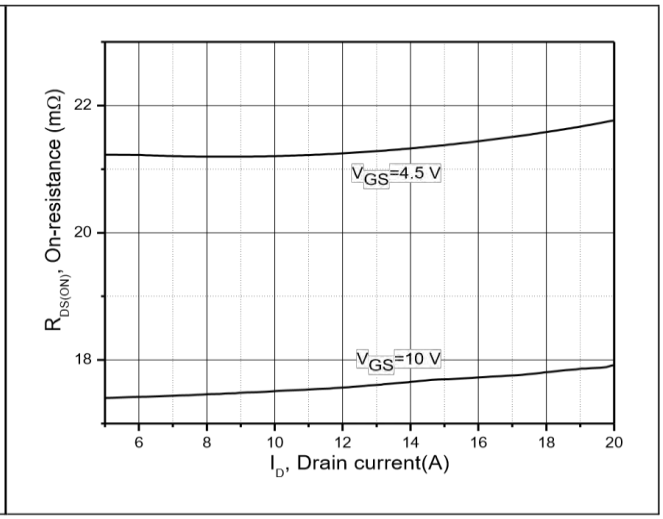


Figure 8, Drain-source on-state resistance

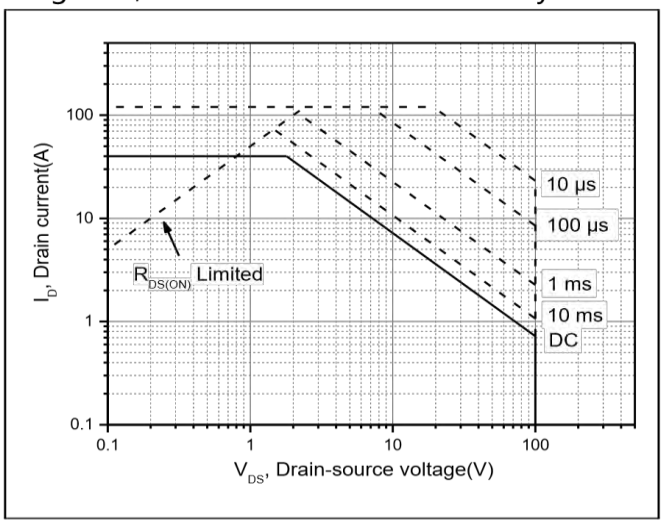


Figure 9, Safe operation area T_C=25 ℃

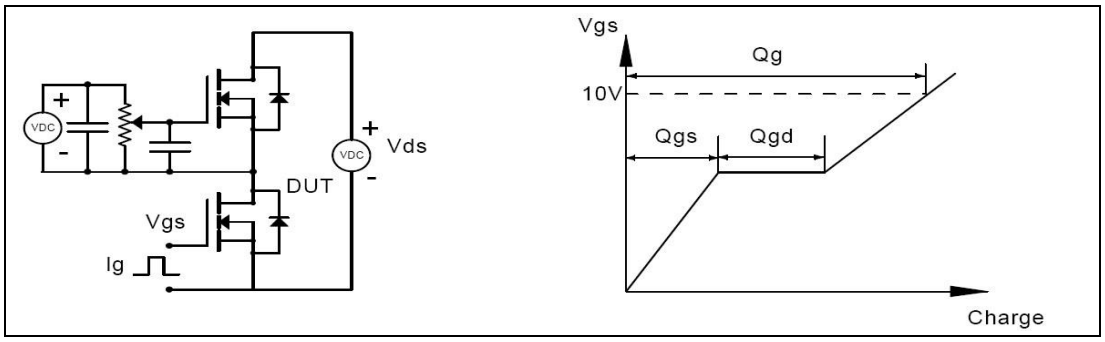


Figure 1, Gate charge test circuit & waveform

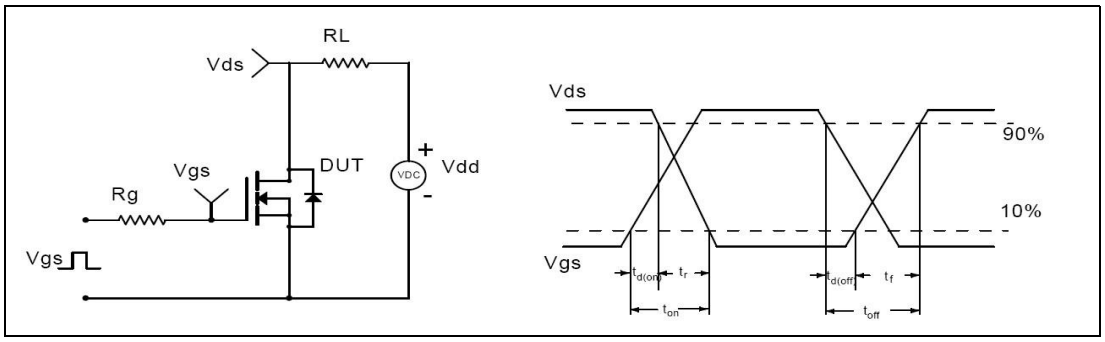


Figure 2, Switching time test circuit & waveforms

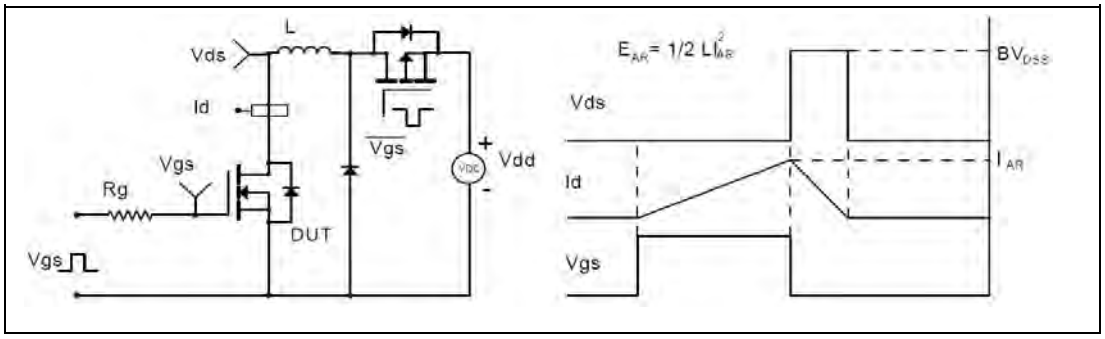


Figure 3 Unclamped inductive switching (UIS) test circuit & waveforms

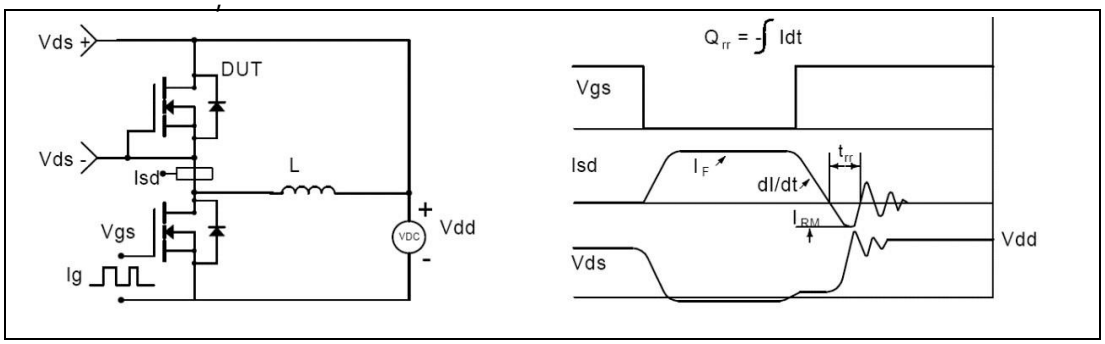
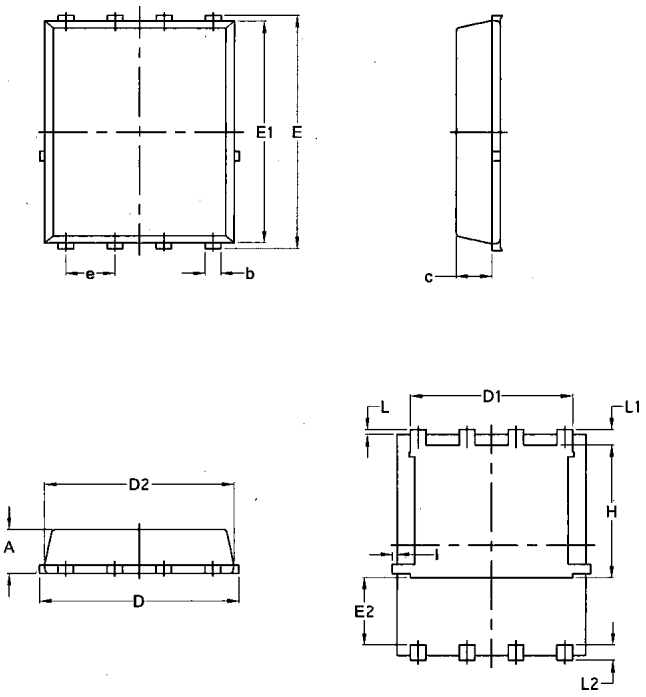


Figure 4, Diode reverse recovery test circuit & waveforms

Package Mechanical Data-DFN5*6-8L-JQ Single



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070

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