LSG45NE8T5 N-Channel Enhancement Mode MOSFET

Features

- Advanced SGT MOS technology
- Low Thermal Resistance
- Halogen-Free & Lead-Free
- 100% EAS Test
- 100% Rg Test

Applications

- Motor Drivers
- Power Tool
- BMS
- DC-DC converters

Pin Configuration

LSG45NE8T5(TO-220)

Pin	Description
1	Gate
2	Drain
3	Source

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Marking Information

Part Marking	Part Number	LFC code
45NE8 YWWXXX	45NE8	YWWXXX

Absolute Maximum Ratings

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		90	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25ºC	123	A
		T_C=100ºC	90	
I_{DM}	Pulsed Drain Current[1]		480	A
I_{AS}	Avalanche Current		25	A
E_{AS}	Single Pulse Avalanche Energy[2]		150	mJ
P_D	Power Dissipation(T_C=25ºC)		156	W
T_J	Operating Junction Temperature Range		-50 to +150	ºC
T_{STG}	Storage Temperature Range		-50 to +150	ºC
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.8	ºC/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		55	ºC/W

Note:
1. Pulse Test: Pulse Width ≦ 100us, Duty Cycle ≦ 2%, Repetitive rating, pulse width limited by $T_{J(MAX)}$ = 150ºC.
2. Limited by $T_{J(MAX)}$, starting T_J = 25ºC, L = 0.5mH, R_g = 25Ω, I_D = 25A, V_{GS} = 10V.

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Electrical Characteristics

(T_A=25ºC Unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	95			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
I_{GSS}	Gate Leakage Current	V_{DS}=0V, V_{GS}=±20V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=90V, V_{GS}=0V			1	uA
$R_{DS(on)}$	Drain-Source On-Resistance	V_{GS}=10V, I_D=50A		4.7	5.8	mΩ
Dynamic						
R_g	Gate Resistance	V_{DS}=0V,f=1MHz		1		Ω
g_{fs}	Forward Transconductance	V_{DS}=5V,I_D=5A		22.7		S
C_{iss}	Input Capacitance	V_{DS}=50V, V_{GS}=0V, f=1MHz		4321		pF
C_{oss}	Output Capacitance			728		
C_{rss}	Reverse Transfer Capacitance			59		
Q_g	Total Gate Charge	V_{DS}=50V, V_{GS}=10V, I_D=40A		81		nC
Q_{gs}	Gate-Source Charge			20		
Q_{gd}	Gate-Drain Charge			27		
$t_{d(on)}$	Turn-On Time	V_{DS}=50V, V_{GS}=10V, I_D=40A,R_g=4.7Ω		36		ns
T_r				77		
$t_{d(off)}$	Turn-Off Time			31		
T_f				34		
Body-Diode						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_S=1A			1.2	V
t_{rr}	Body Diode Reverse Recovery Time	I_s=40A, di/dt=100A/us		52		nS
Q_{rr}	Body Diode Reverse Recovery Charge	I_s=40A, di/dt=100A/us		73		nC

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Typical Performance Characteristics

Fig.1 Typical Output Characteristics

Fig.2 Typical Transfer Characteristics

Fig.3 On-Resistance vs. Drain Current

Fig.4 On-Resistance vs. Gate-Source Voltage

Fig.5 On-Resistance vs. Junction Temperature

Fig.6 Forward Characteristics of Body Diode

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Typical Performance Characteristics

Fig.7 $V_{GS(th)}$ vs. Junction Temperature

Fig.8 $V_{(BR)DSS}$ vs. Junction Temperature

Fig.9 I_{DSS} vs. Junction Temperature

Fig.10 Capacitance Characteristics

Fig.11 Typical Gate Charge vs. Gate-Source Voltage

Fig.12 Safe Operating Area

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Typical Performance Characteristics

Fig.13 Transient Thermal Impedance

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Typical Characteristics

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching Test Circuit & Waveforms

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Package Dimension(Units:mm)

TO-220

Symbol	Min	Max	Symbol	Min	Max
W	9.80	10.20	**L3**	12.88	13.28
W1	2.54 BSC		**L4**	3.10 BSC	
W2	0.70	0.90	**L5**	13.50 BSC	
W3	1.17	1.37	**T**	4.30	4.70
W4	1.17	1.62	**T1**	1.20	1.40
W5	8.00 BSC		**T2**	2.20	2.60
L	9.00	9.40	**T3**	0.45	0.60
L1	6.30	6.70	**G(Φ)**	3.50	3.70
L2	2.70	2.90			

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