

•General Description

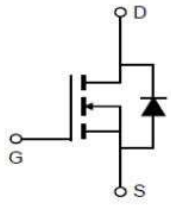
The SGT MOSFET LH03N04 has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

•Features

- Fast switching
- Low On-Resistance
- Low Miller Charge
- Low Input Capacitance

•Application

- Lighting
- Power Supplies
- PD Fast Charging



$V_{DS} = 40V$

$R_{DS(ON)} = 2.8m\Omega$

$I_D = 70A$



TO-252

■ RoHS
COMPLIANT

•Ordering Information:

Part Number	LH03N04
Package	TO-252
Basic Ordering Unit (pcs)	2500
Normal Package Material Ordering Code	LH03N04T5-TO252-TAP
Halogen Free Ordering Code	LH03N04T5-TO252-TAP-HF

•Absolute Maximum Ratings (TC =25°C)

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current , $T_C = 25^\circ C$	I_D	70	A
Pulsed drain current ($T_C = 25^\circ C$, tp limited by T_{jmax}) ¹	I_D pulse	210	A
Avalanche Current	I_{AS}	35	A
Single Pulse Avalanche Energy ²	E_{AS}	110	mJ
Maximum Power Dissipation	$P_D(TC=25^\circ C)$	26.6	W
Operating Temperature	T_J	-55~+150	°C
Storage Temperature	T_{STG}	-55~+150	°C

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40	45	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	--	2.5	V
Drain-source On Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	--	2.2	2.8	mΩ
		$V_{GS}=4.5V, I_D=15A$	--	3.0	4.5	
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V, T_J=25^\circ C$	--	--	10	uA
		$V_{DS}=32V, V_{GS}=0V, T_J=125^\circ C$	--	--	100	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA

DYNAMIC CHARACTERISTICS

Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=20V$ $f=1.0MHz$	--	2230	--	pF
Output Capacitance	C_{oss}		--	1056	--	
Reverse transfer Capacitance	C_{rss}		--	108	--	
Turn-on Delay Time	$T_{d(on)}$	$V_{DD}=20V$ $V_{GS}=10V,$ $I_D=20A$ $R_G=3.0\Omega$	--	11.7	--	ns
Turn-on Rise Time	T_R		--	48.4	--	
Turn -Off Delay Time	$T_{d(off)}$		--	55.4	--	
Fall Time	T_f		--	41.7	--	

GATE CHARGE CHARACTERISTICS

Total Gate Charge	Q_g	$I_D=20A,$ $V_{DS}=20V$ $V_{GS}=10V$	--	45.1	---	nC
Gate-to-Source Charge	Q_{gs}		--	7.46	--	
Gate-to-Drain Charge	Q_{gd}		--	11.7	---	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

Continuous Diode Forward Current	I_S	--	--	--	70	A
Diode Forward Voltage	V_{SD}	$T_J=25^\circ C, I_S=1A$	--	0.7	1.3	V
Reverse Recovery Time	t_{rr}	$I_f=20A$ $di_f/dt=100A/\mu s$	--	44.5	--	nS
Reverse Recovery Charge	Q_{rr}		--	40.1	--	nC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	4.7	$^\circ C/W$
Thermal Resistance Junction-ambient	R_{thJA}	54.5	$^\circ C/W$

Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature.

2. $I_{AS}=35A, V_{DD}=20V, R_G=25\Omega$, Starting $T_J=25^\circ C$

3.Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

•Typical Characteristics

Fig1. Output Characteristics

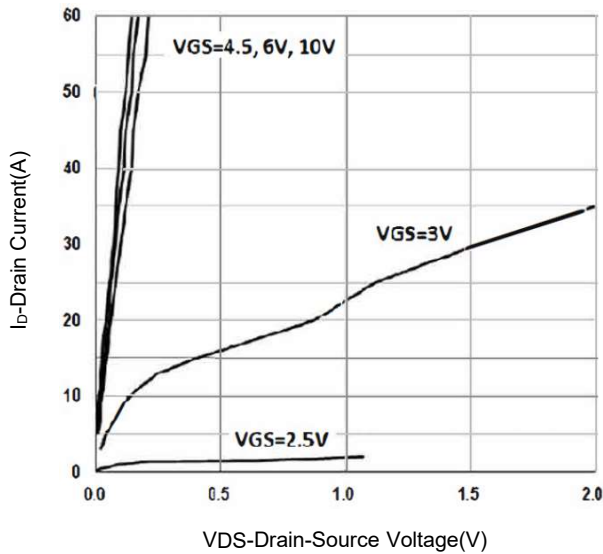


Fig2. Gate Threshold Voltage

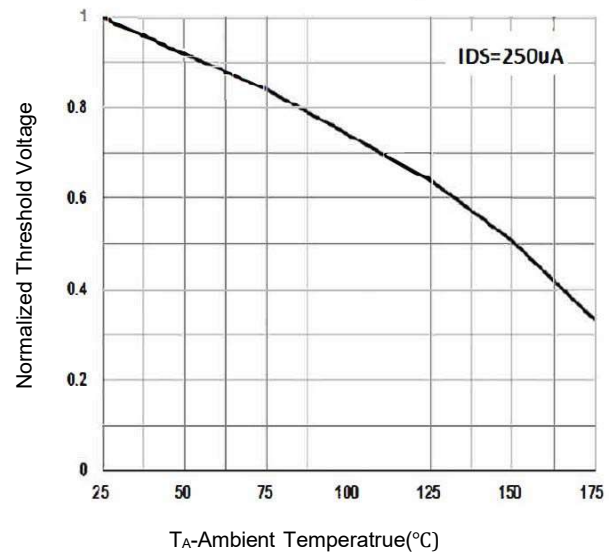


Fig3. Gate-Source On Resistance

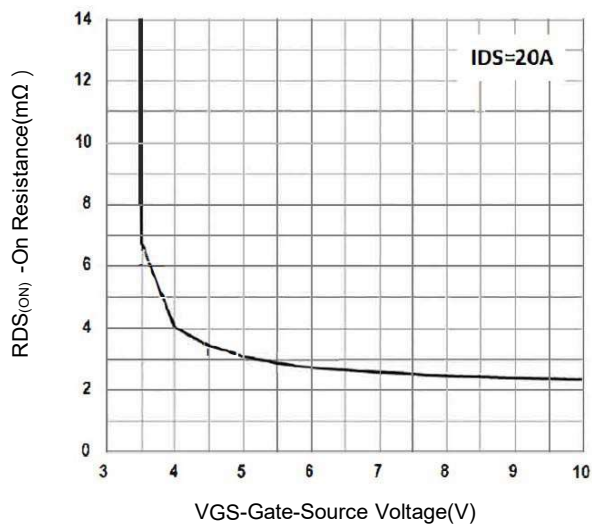


Fig4. Drain-Source On Resistance

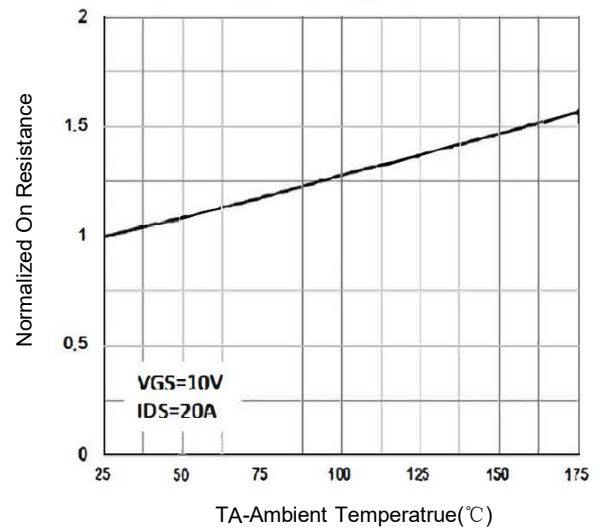


Fig5. Drain-Source On Resistance

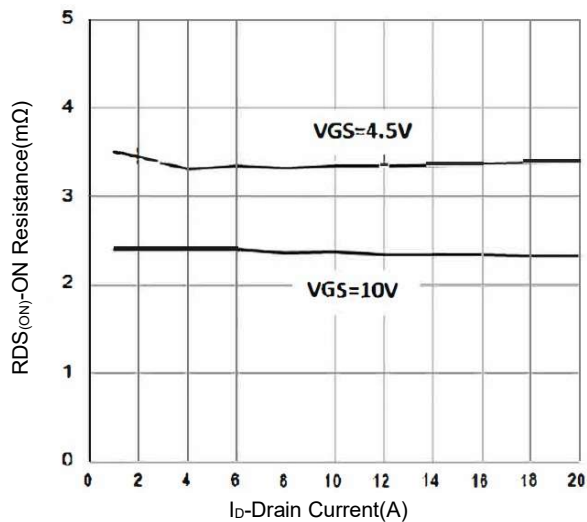
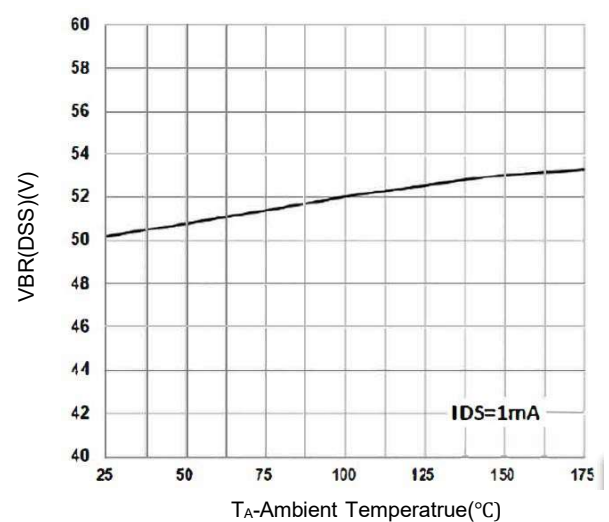


Fig6. Drain-Source Breakdown Voltage



● **Typical Characteristics**(cont.)

Fig7. Power Dissipation

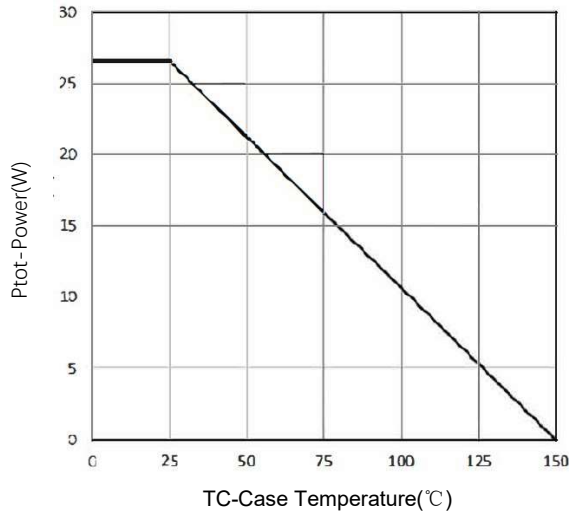


Fig8. Drain Current

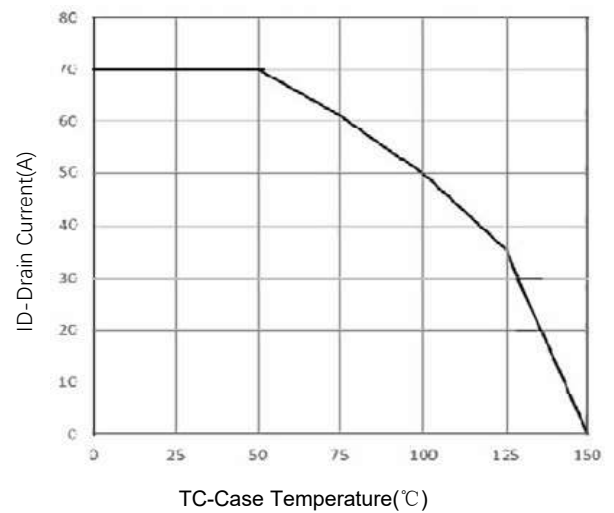


Fig9. Safe Operation Area

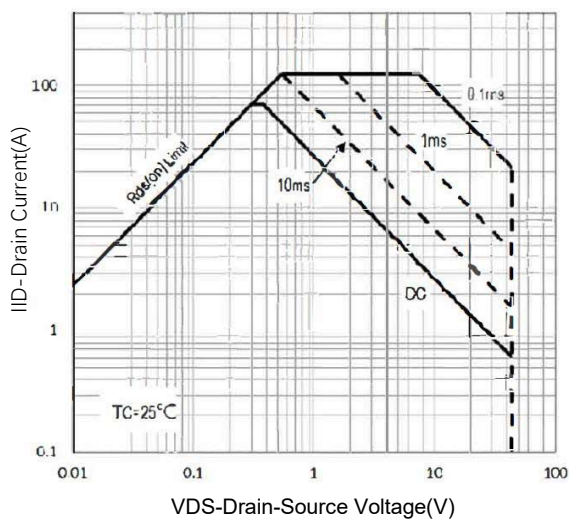


Fig10. Transient Thermal Impedance

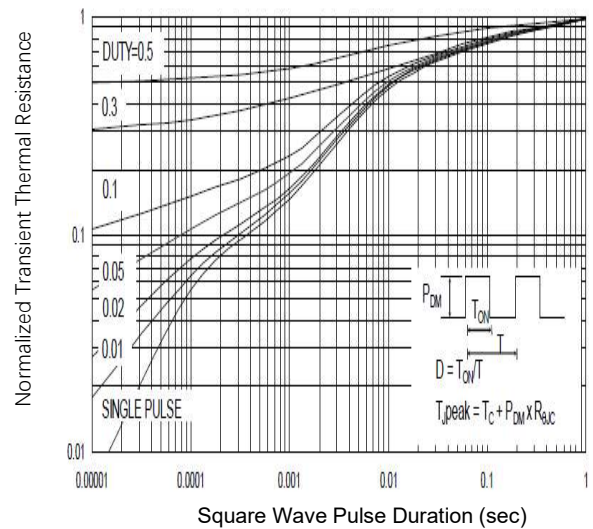


Fig11. Capacitance

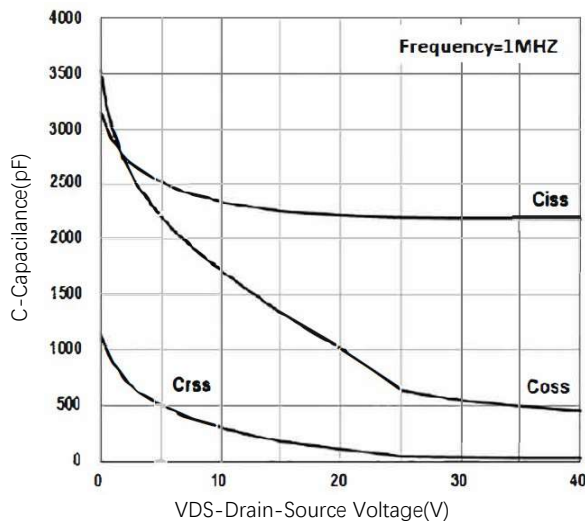
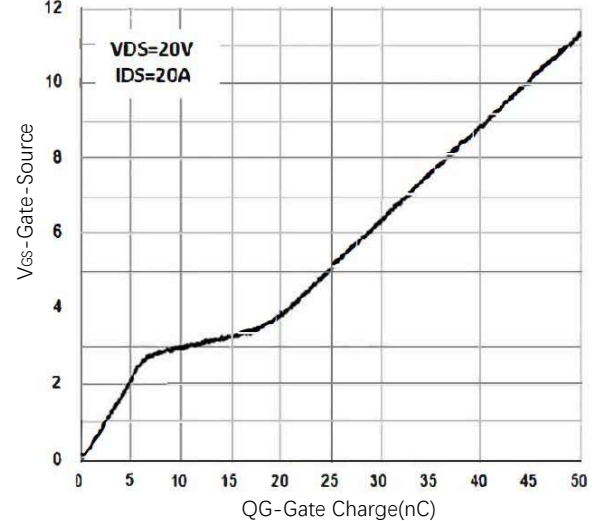


Fig12. Gate Charge



• **Test Circuits & Waveforms**

Fig.1 Gate Charge Waveform

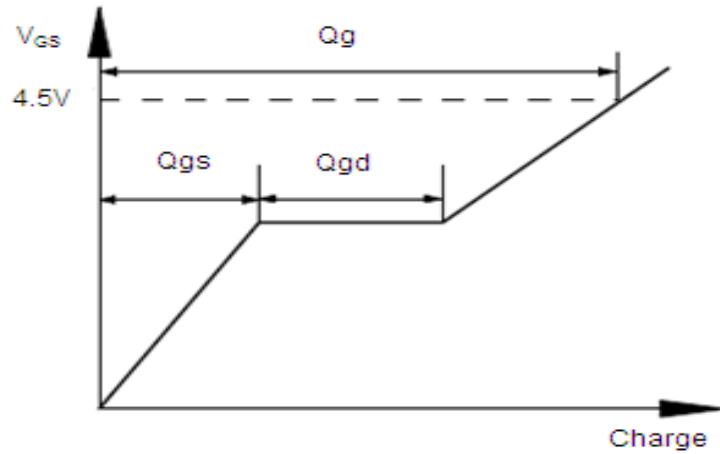


Fig.2 Switching Time Waveform

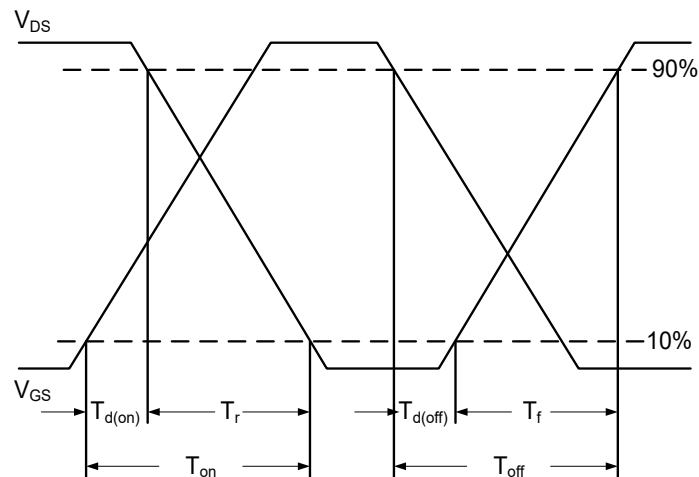
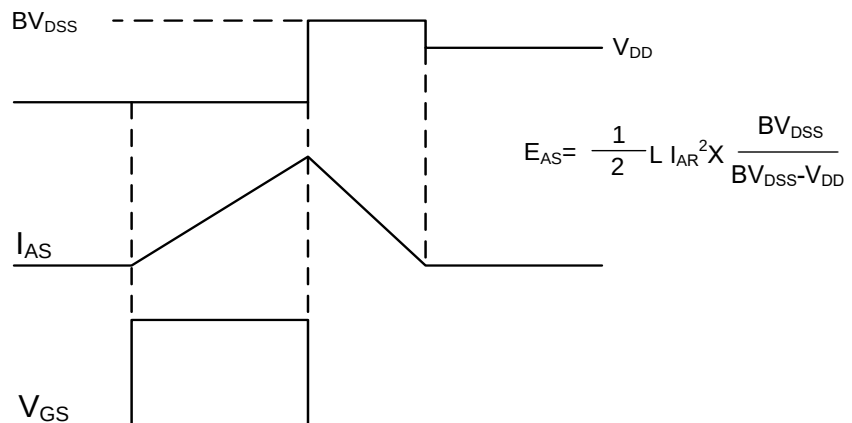


Fig.11 Unclamped Inductive Switching Waveform



•Dimensions (TO-252)

UNIT:mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	L2	0.60	1.20
b	0.50	0.90	L3	1.20	1.80
b1	0.70	1.20	B	0.80	1.30
b2	0.40	0.70	C	0.40	0.70
D	6.20	6.80	D1	5.10	5.60
E	5.80	6.40	e1	2.10	2.45
L	3.60	4.60	e2	4.40	4.80
L1	0.80	1.60			

