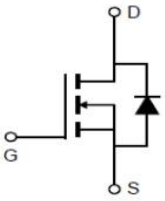
●General Description

The N-Channel MOSFET LH042N085S-A has the low $R_{DS(on)}$,low gate charge,fast switching and excellent avalanche characteristics.This device is suitable for fast charge and lighting.



VDS =85V

$R_{DS(ON)}$ =4.2mΩ

ID =120A

■ RoHS COMPLIANT

TO-263

●Features

■N-channel, normal level
■Excellent Gate charge×RDS(on) (FOM)
■Very low on-resistance RDS(on)

●This chip is used for:

■Industrial power supplies
■Boost converters
■Rectifier
■Telecom
■Industrial power supplies

●Ordering Information:

Part Number	LH042N085S-A
Package	TO-263
Basic Ordering Unit (pcs)	800
Normal Package Material Ordering Code	LH042N085S-AT63-TO263-TAP
Halogen Free Ordering Code	LH042N085S-AT63-TO263-TAP-HF

●Absolute Maximum Ratings（TC =25℃）

PARAMETER	SYMBOL	Value	UNIT
Drain-Source Voltage	BV_{DSS}	85	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current - Continuous	ID(TC = 25°C)	120	A
	ID(TC=100°C)	68	
Drain Current - Pulsed [1]	I_{DM}	360	A
Single Pulsed Avalanche Energy[2]	E_{AS}	102	mJ
Power Dissipation(TC=25℃)	P_D	165	W
Operating Temperature	T_J	-55~+150	℃
Storage Temperature	T_{STG}	-55~+150	℃

●Electronic Characteristics

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D=250uA	85	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250uA	2.0	--	4.0	V
Drain-Source on-state resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D=20A	--	4.2	5.0	mΩ
		V_{GS} =4.5V, I_D=20A	--	5.2	6.2	mΩ
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=64V,V_{GS}=0V	--	--	1	uA
Gate Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
Forward Transconductance[3]	g_{FS}	V_{DS}=5V,I_D=20A	--	73	--	S
Input Capacitance	Ciss	V_{GS}=0V, V_{DS}=40V, f=1MHz	--	2800	--	pF
Output Capacitance	Coss		--	406	--	
Reverse Transfer Capacitance	Crss		--	32	--	
Turn-on delay time[3,4]	Td(on)	V_{GS}=10V,V_{DD}=40V , R_G=3Ω ,ID=20A	--	9.2	--	ns
Rise time[3,4]	tr		--	4.9	--	
Turn -Off Delay Time[3,4]	Td(off)		--	35	--	
Fall time[3,4]	tf		--	6.9	--	
Total Gate Charge(10V)[3,4]	Qg	VGS=10V, VDS=40V, ID=20A, f=1MHz	--	39	--	nC
Gate-to-Source Charge[3,4]	Qgs		--	7.2	--	
Gate-to-Drain Charge[3,4]	Qgd		--	6.5	---	
Gate resistance	R_G	V_{GS}=0V,V_{DS}=0V, f=1MHz	--	1.5	--	Ω
Diode Forward Voltage	V_{SD}	Is=20A,V_{GS} =0V	--	--	1.2	V
Reverse Recovery Time	Trr	If=20A,di_F/dt=100A/μs	--	25	--	ns
Reverse Recovery Charge	Qrr		--	87	--	nC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	Rth_{JC}	0.76	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	62	℃/W

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L=0.5mH,IAS=20A,VDD=10V,RG=25Ω， Starting Tj = 25°C
3. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%

●Typical Characteristics

Fig.1 Typical Output Characteristics

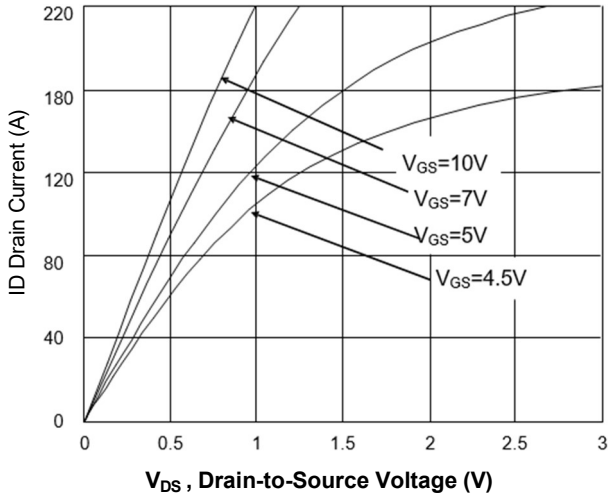


Fig.2 On-Resistance v.s Gate-Source

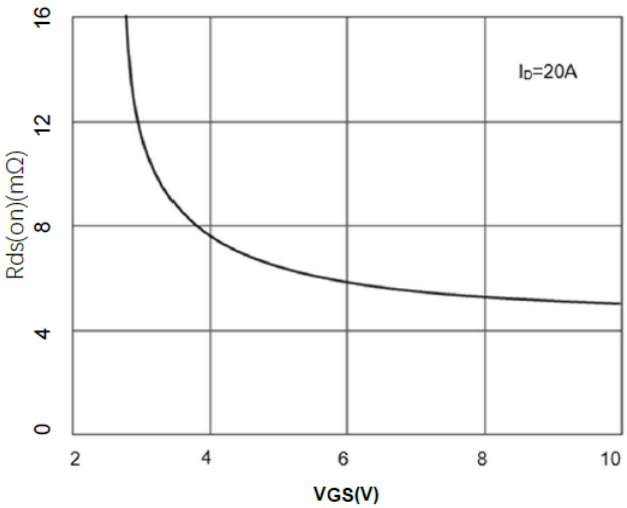


Fig.3 Forward Characteristics of Reverse

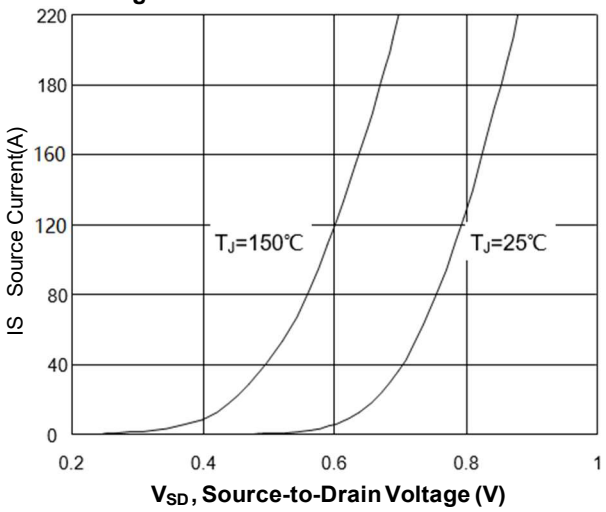


Fig.4 Gate-Charge Characteristics

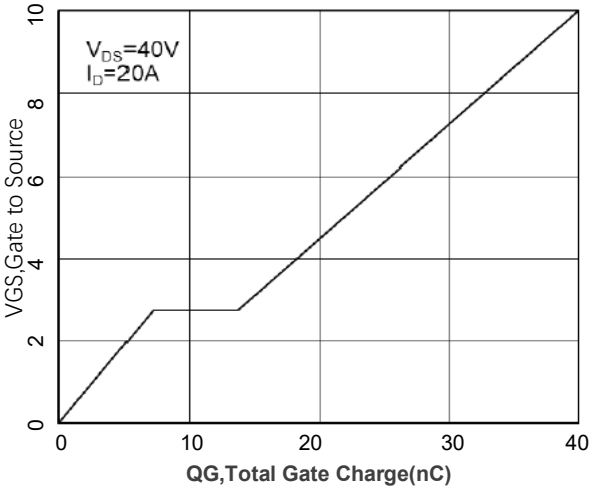


Fig.5 Normalized V_{GS}(th) v.s Tj

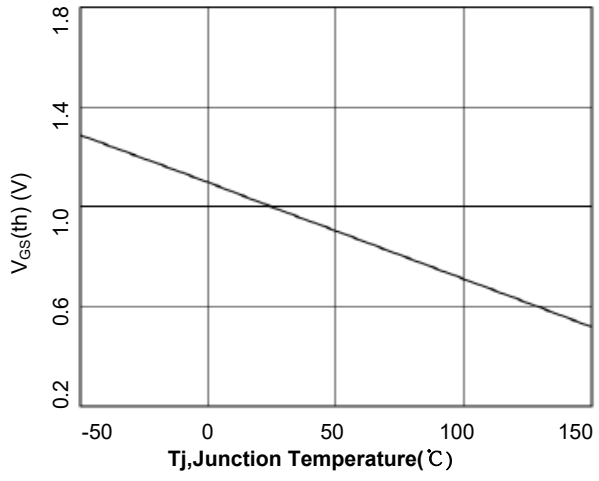
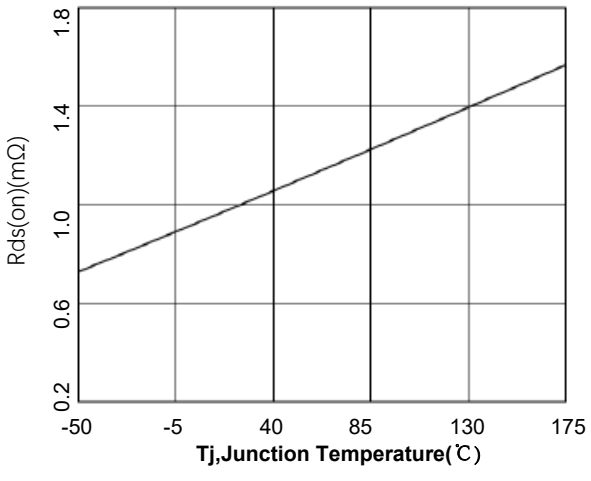


Fig.6 Normalized Rdson v.s Tj



●Typical Characteristics(cont.)

Fig.7 Capacitance

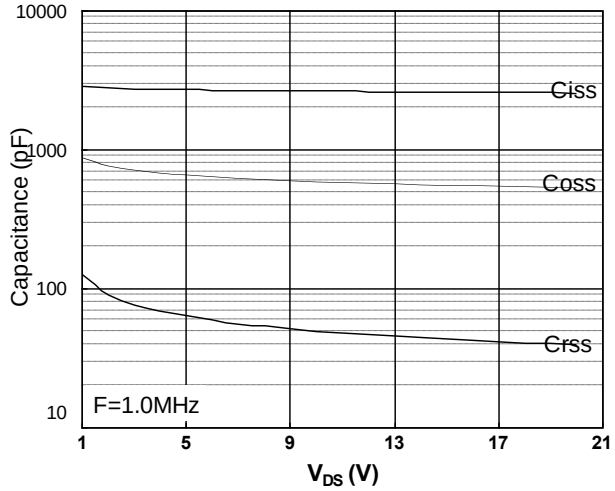


Fig.8 Safe Operating Area

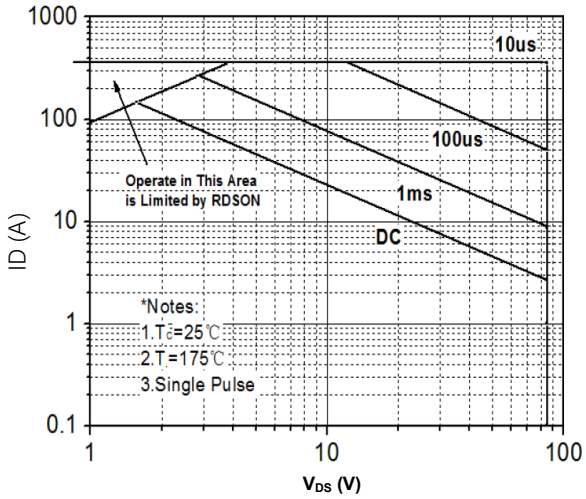
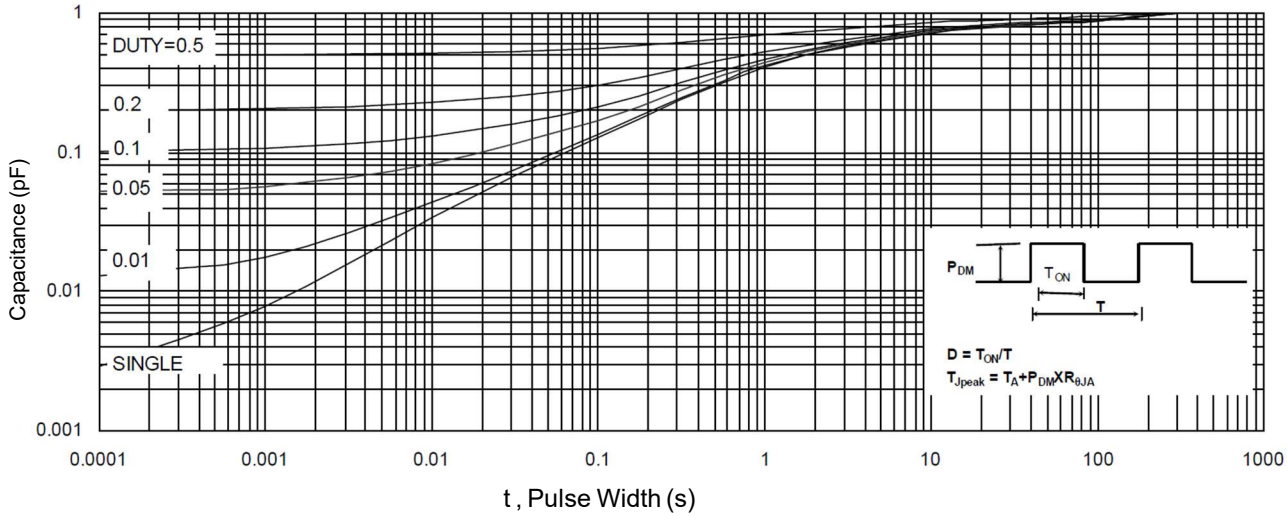


Fig.9 Normalized Maximum Transient Thermal Impedance



●Test Circuits & Waveforms

Fig.10 Switching Time Waveform

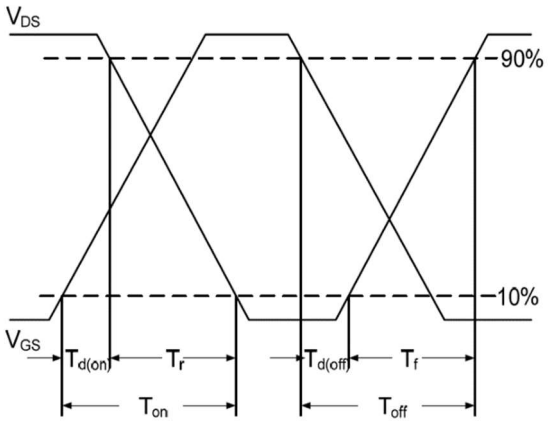
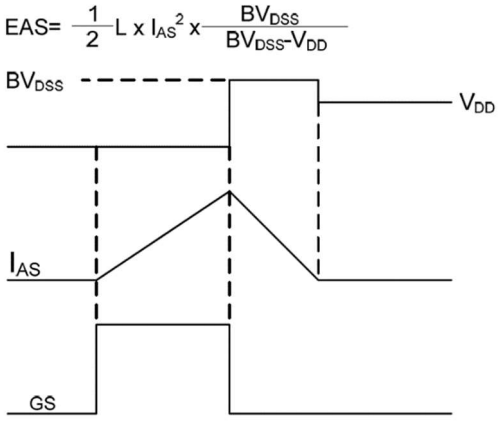


Fig.11 Unclamped Inductive Waveform



- **Dimensions (TO-263)**

Unit：mm

SYMBOL	min	max	SYMBOL	min	max
A	4.25	4.85	B1	1,20	1.80
A1	2.30	3.00	e	2.40	2.70
A2	1.20	1.40	L	4.80	5.60
b	0.60	0.90			
b1	1.10	1.70			
c	0.40	0.70			
D	9.80	10.60			
B	10.40	11.40