

●General Description

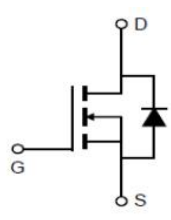
The N-Channel MOSFET LH042N085S has the low $R_{DS(on)}$, low gate charge, fast switching and excellent avalanche characteristics. This device is suitable for fast charge and lighting.

●Features

- N-channel, normal level
- Excellent Gate charge $\times$ $R_{DS(on)}$ (FOM)
- Very low on-resistance $R_{DS(on)}$

●This chip is used for:

- Industrial power supplies
- Boost converters
- Rectifier
- Telecom
- Industrial power supplies



$V_{DS} = 85V$

$R_{DS(on)} = 4.2m\Omega$

$I_D = 120A$

■ RoHS COMPLIANT



TO-263

●Ordering Information:

Part Number	LH042N085S
Package	TO-263
Basic Ordering Unit (pcs)	800
Normal Package Material Ordering Code	LH042N085ST63-TO263-TAP
Halogen Free Ordering Code	LH042N085ST63-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	$I_D(TC = 25^\circ C)$	120	A
	$I_D(TC=100^\circ C)$	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}	$V_{GS}=0V, I_D=250\mu A$	85	--	--	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	--	2.5	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	μA
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	±100	nA
Forward Transconductance ³	g_{FS}	$V_{DS}=5V, I_D=20A$	--	73	--	S
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=40V, f=1MHz$	--	2800	--	pF
Output Capacitance	C_{oss}		--	406	--	
Reverse Transfer Capacitance	C_{rss}		--	32	--	
Turn-on delay time ^{3,4}	$T_d(on)$	$V_{GS}=10V, V_{DD}=40V, R_G=3\Omega, I_D=20A$	--	9.2	--	ns
Rise time ^{3,4}	t_r		--	4.9	--	
Turn -Off Delay Time ^{3,4}	$T_d(off)$		--	35	--	
Fall time ^{3,4}	t_f		--	6.9	--	
Total Gate Charge(10V) ^{3,4}	Q_g	$V_{GS}=10V, V_{DS}=40V, I_D=20A, f=1MHz$	--	39	--	nC
Gate-to-Source Charge ^{3,4}	Q_{gs}		--	7.2	--	
Gate-to-Drain Charge ^{3,4}	Q_{gd}		--	6.5	--	
Gate resistance	R_G	$V_{GS}=0V, V_{DS}=0V, f=1MHz$	--	1.5	--	Ω
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$	--	--	1.2	V
Reverse Recovery Time	T_{rr}	$I_f=20A, di_F/dt=100A/\mu s$	--	25	--	ns
Reverse Recovery Charge	Q_{rr}		--	87	--	nC

●Thermal Characteristics

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance Junction-case	R_{thJC}	0.76	°C/W
Thermal Resistance Junction-ambient	R_{thJA}	62	°C/W

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L=0.5mH, I_{AS}=20A, V_{DD}=10V, R_G=25Ω , Starting T_j = 25°C
3. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

● **Typical Characteristics**

Fig.1 Typical Output Characteristics

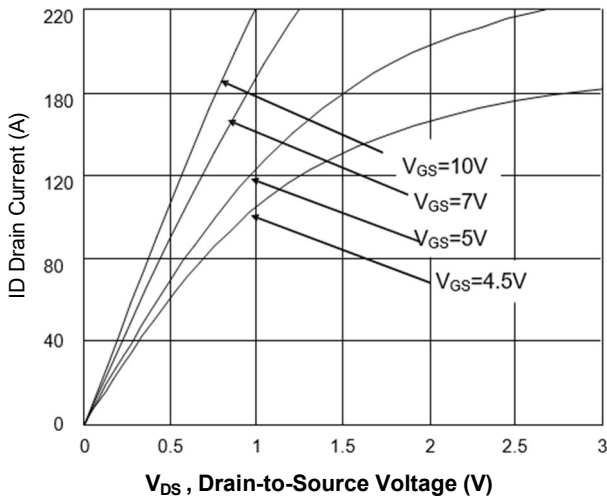


Fig.2 On-Resistance v.s Gate-Source

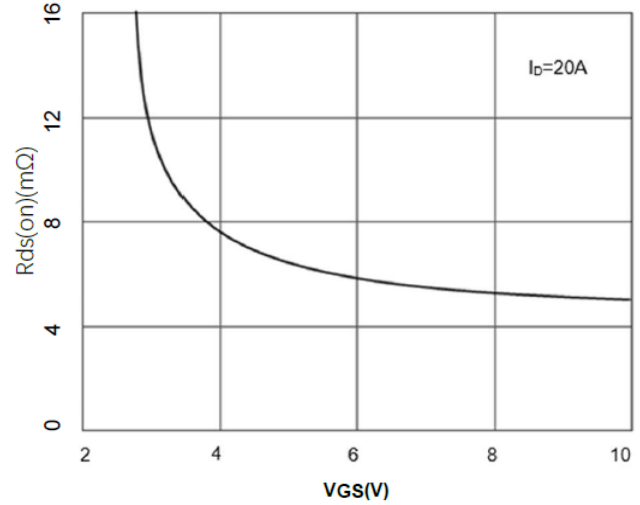


Fig.3 Forward Characteristics of Reverse

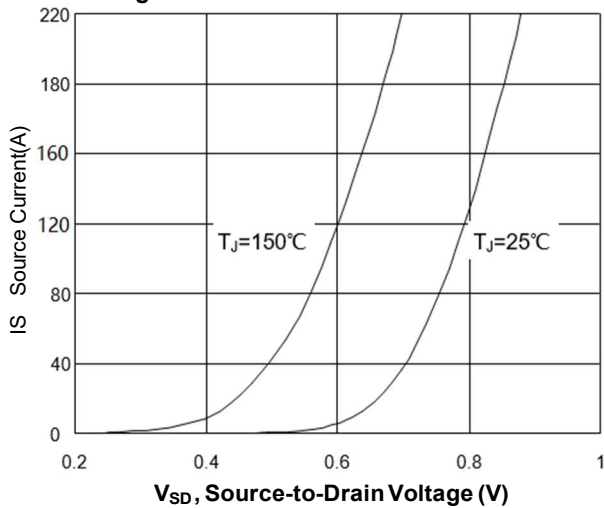


Fig.4 Gate-Charge Characteristics

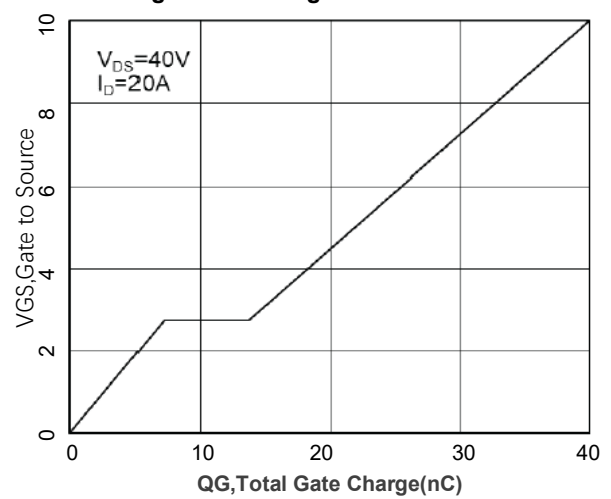


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

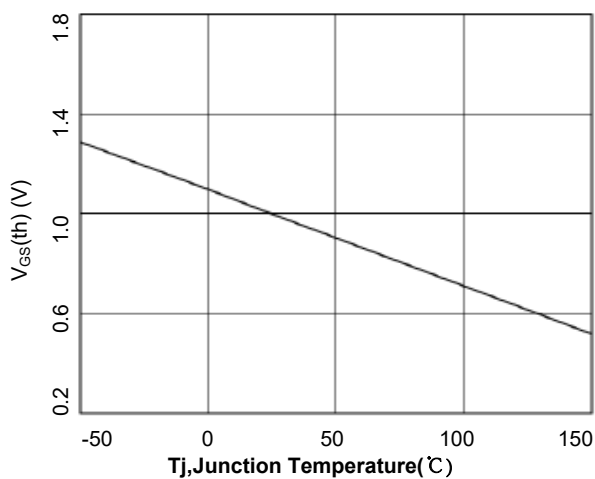
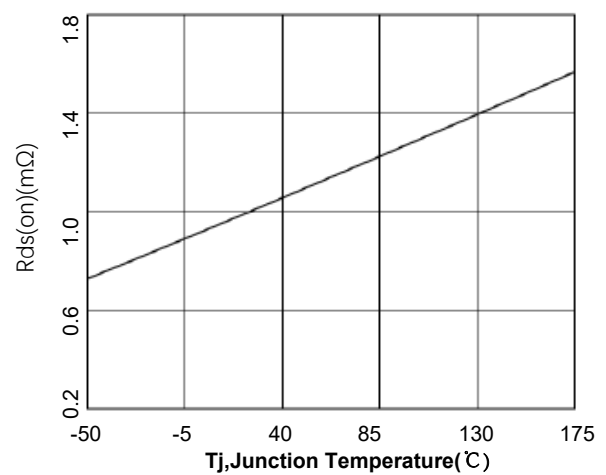


Fig.6 Normalized $R_{DS(on)}$ v.s T_J



● **Typical Characteristics(cont.)**

Fig.7 Capacitance

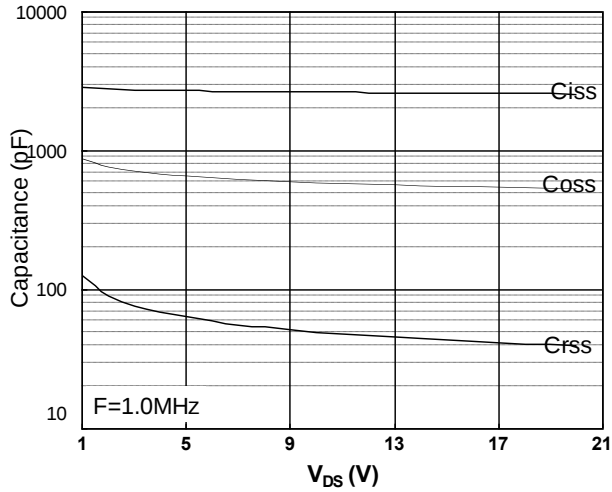


Fig.8 Safe Operating Area

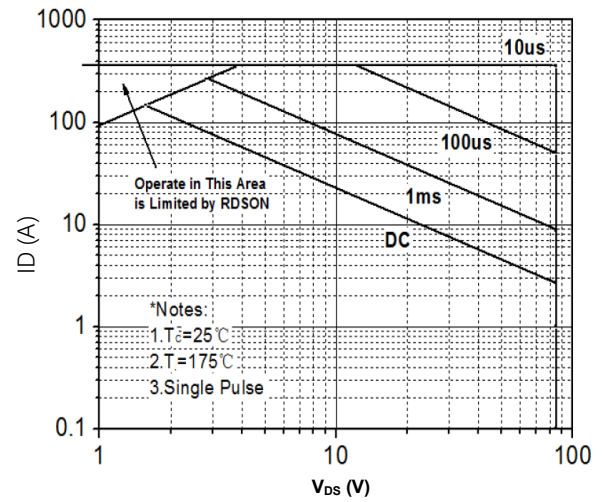
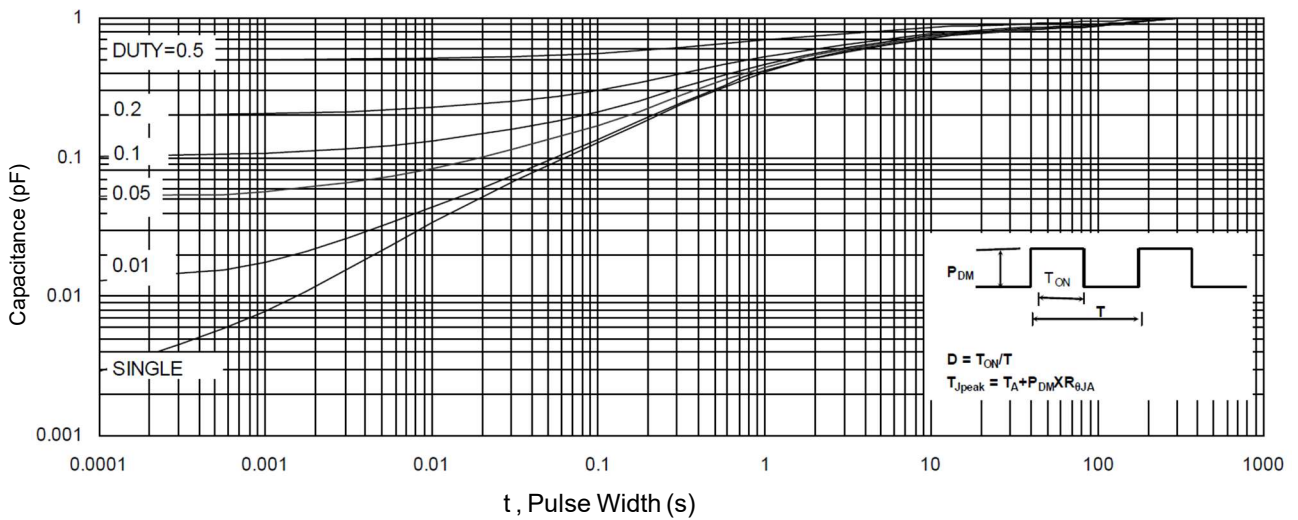


Fig.9 Normalized Maximum Transient Thermal Impedance



● **Test Circuits & Waveforms**

Fig.10 Switching Time Waveform

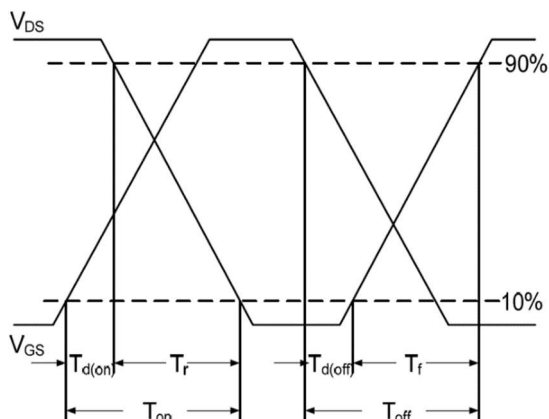
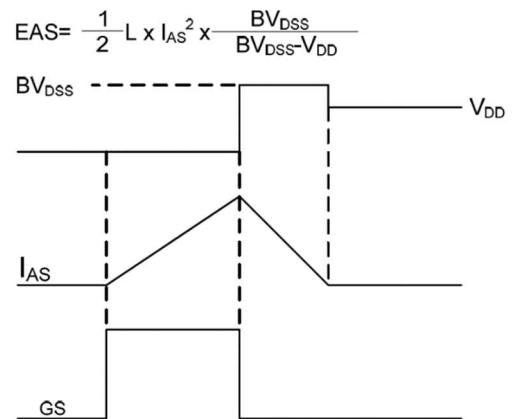


Fig.11 Unclamped Inductive Waveform



• **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			

