Features

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)

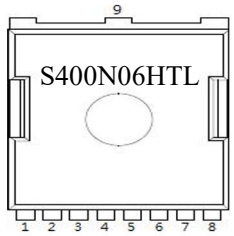
Bvdss	Rdson	ID
60V	1.25mΩ	400A

Application

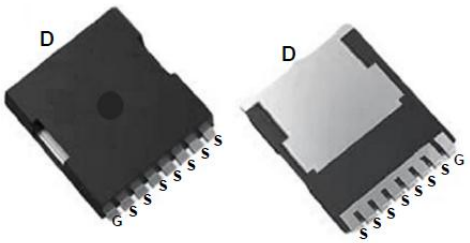
- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

RoHS

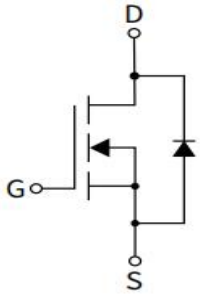
Package



Marking and pin assignment



TOLL-8L top view



Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
S400N06HTL	S400N06HTL	TOLL-8L	2000

Absolute Maximum Ratings (T_C=25℃unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25℃	I_D	400	A
	T_C=100℃	I_D	268	A
Pulsed Drain Current[1]		I_{DM}	1512	A
Power Dissipation	T_C=25℃	P_D	454.5	W
Single Pulse Avalanche Energy[2]		EAS	500	mJ
Junction Temperature		T_J	-55~+175	℃
Storage Temperature		T_{STG}	-55~+175	℃

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient[3]	$R_{\theta JA}$	39	℃/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.33	℃/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HLS400N06HTL	S400N06HTL	1	9	2,3,4,5,6,7,8	Tape Reel

N-Channel Electrical Characteristics (T_J=25℃unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	BV_{DSS}	I_d = 250μA, V_{gs} = 0V	60	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V,T_J=25°C	-	-	1	μA
		V_{DS}=60V,V_{GS}=0V,T_J=100°C	-	-	100	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS},I_D =250uA	2	2.9	4	V
Static Drain-Source On-Resistance[4]	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	1.25	1.55	mΩ
Forward Transconductance[4]	gfs	V_{DS}=10V, I_D=20A	-	62	-	S
Gate resistance	Rg	f=1MHz	-	2.6	-	Ω
Input Capacitance	C_{iss}	V_{DS} = 30V, V_{GS} =0V, f =1MHz	-	5990	-	pF
Output Capacitance	C_{oss}		-	2257	-	pF
Reverse Transfer Capacitance	C_{rss}		-	86	-	pF
Turn-ON Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DD} 30V, R_G=3Ω, I_D=20A	-	15.6	-	ns
Rise Time	t_r		-	29	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	63	-	ns
Fall Time	t_f		-	51	-	ns
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=30V, I_D=20A	-	102	-	nC
Gate Source Charge	Q_{gs}		-	24.6	-	nC
Gate Drain Charge	Q_{gd}		-	28.2	-	nC
Body Diode Reverse Recovery Time	t_{rr}	I_F=20A, dI/dt=100A/μs	-	80	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	114	-	nC
Maximum Continuous Drain to Source Diode Forward Current	I_S	-	-		400	A
Drain to Source Diode Forward Voltage[4]	V_{SD}	V_{GS}=0V, I_S=20A	-		1.2	V

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=175° C.

2. The test condition is V_{DD}= 90V, V_{GS}= 10V, L= 0.4mH, IAS= 50A.

3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

4. The data tested by pulsed, pulse width ≤ 300us , duty cycle ≤ 2%.

Typical Characteristics

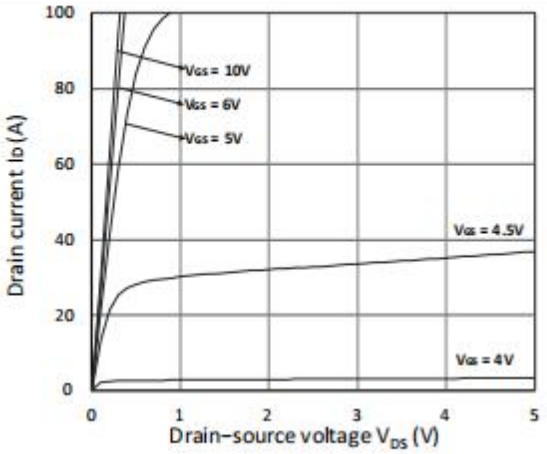


Figure 1. Output Characteristics

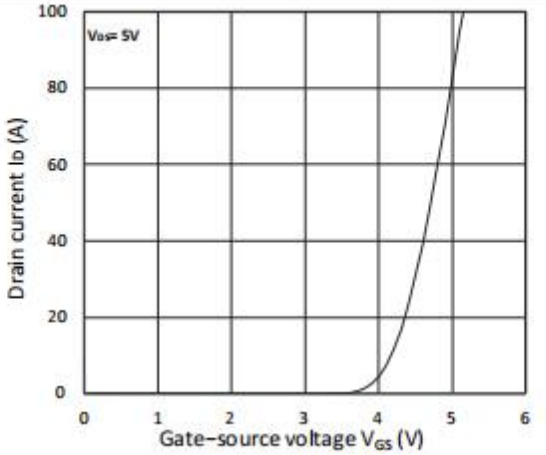


Figure 2. Transfer Characteristics

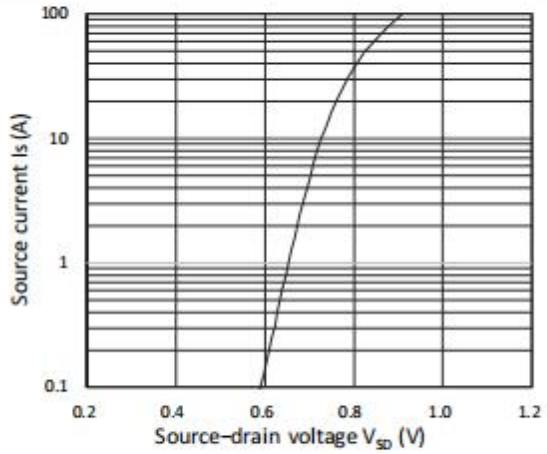


Figure 3. Forward Characteristics of Reverse

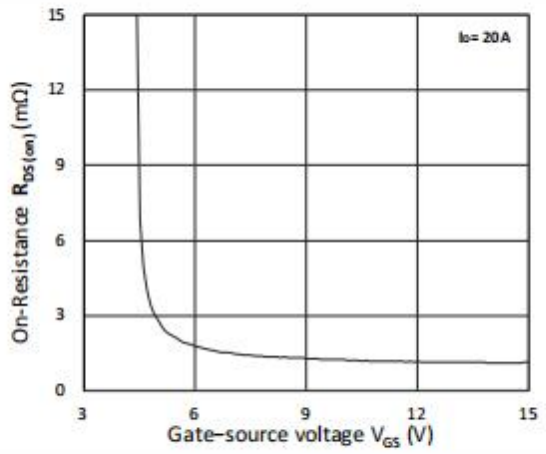


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

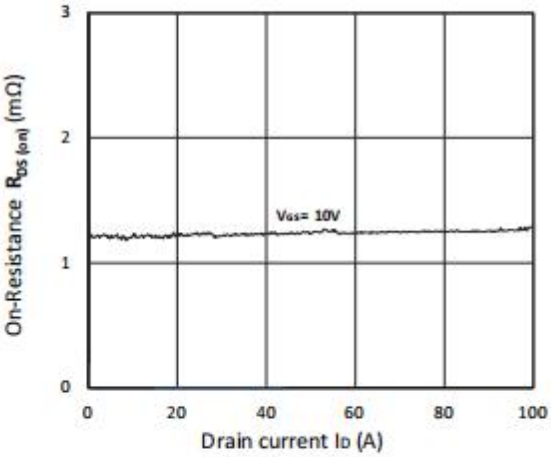


Figure 5. $R_{DS(ON)}$ vs. I_D

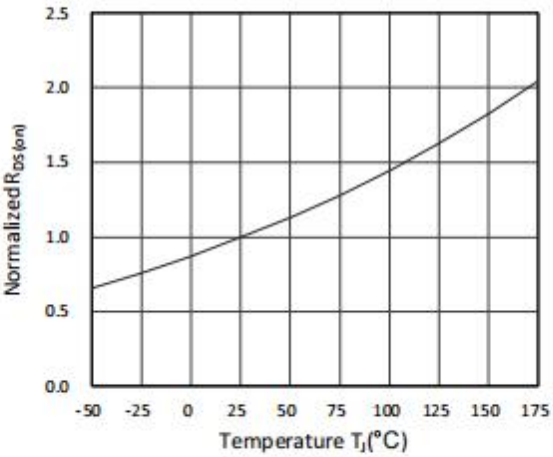


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

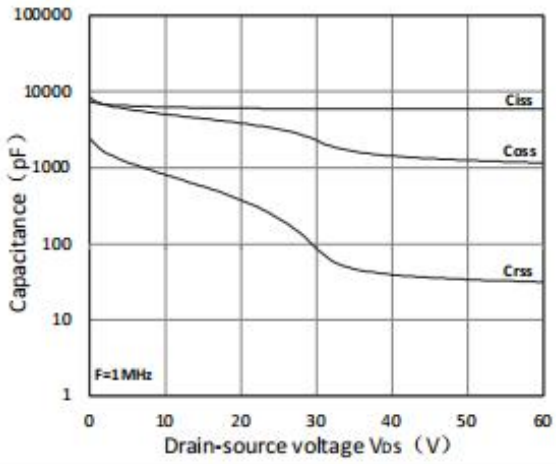


Figure 7. Capacitance Characteristics

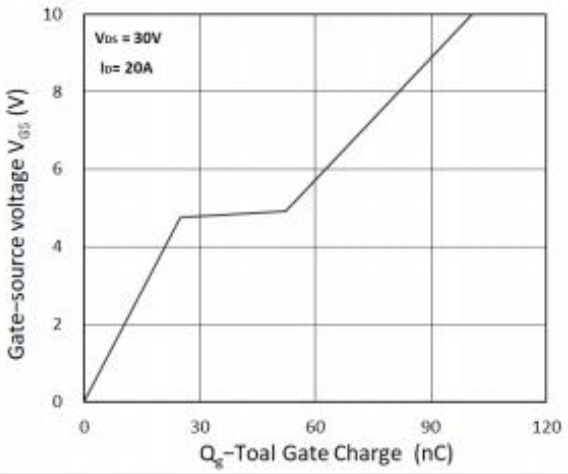


Figure 8. Gate Charge Characteristics

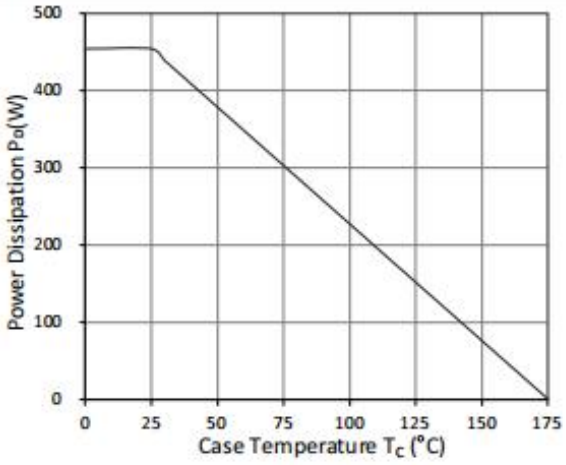


Figure 9. Power Dissipation

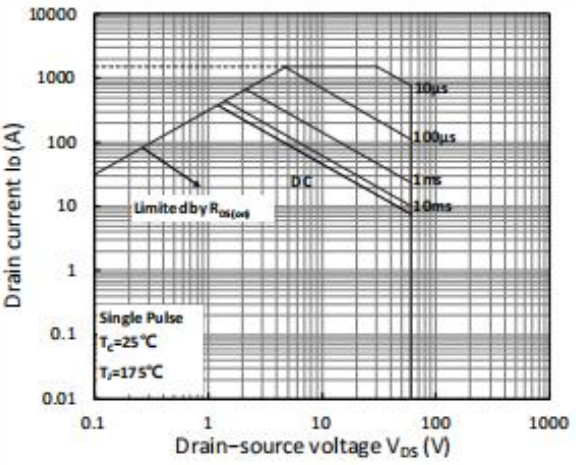


Figure10. Safe Operating Area

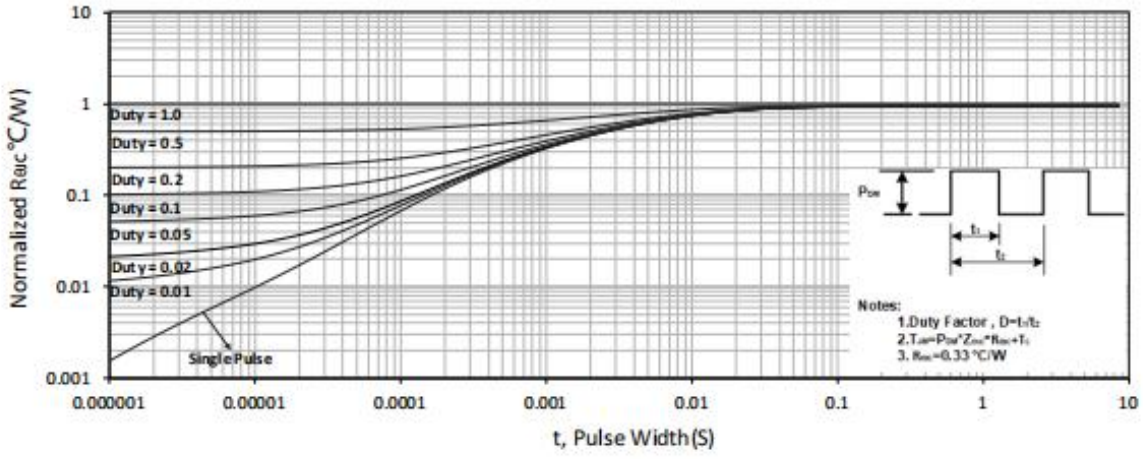


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

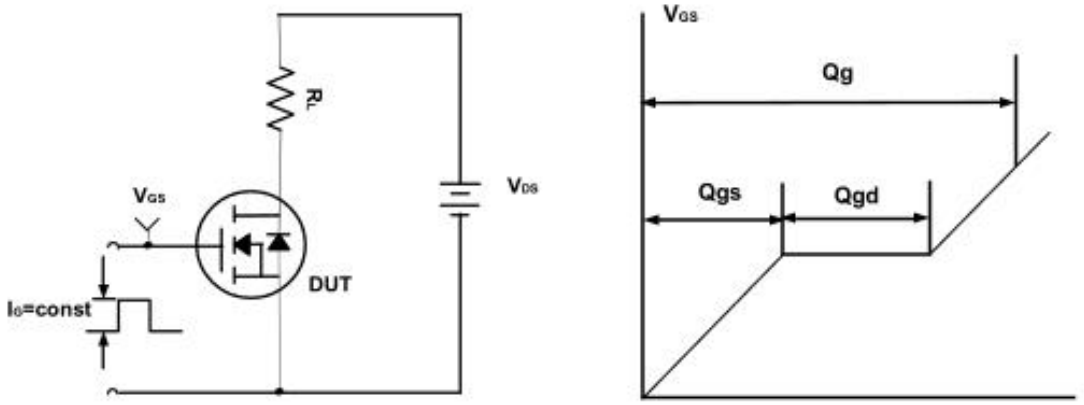


Figure A. Gate Charge Test Circuit & Waveforms

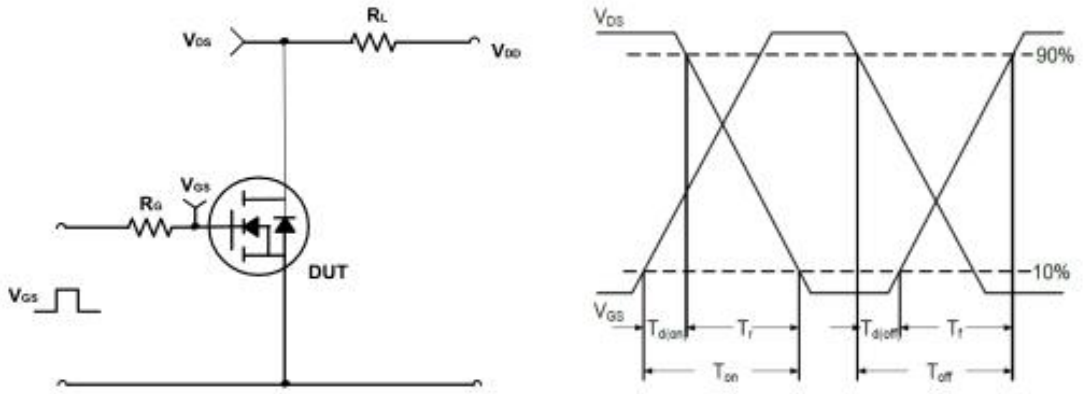


Figure B. Switching Test Circuit & Waveforms

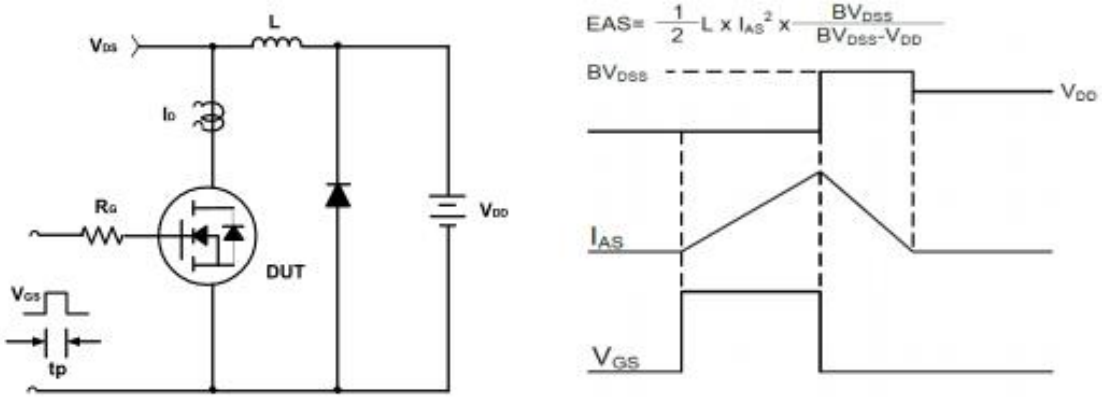
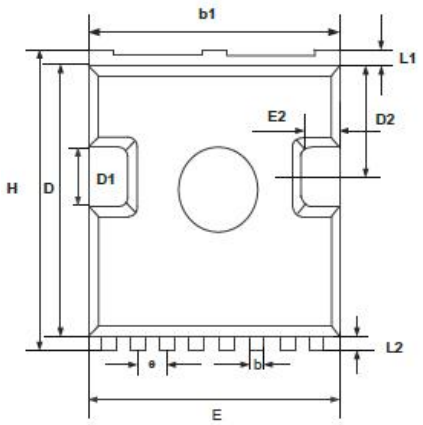
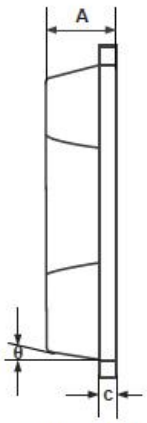


Figure C. Unclamped Inductive Switching Circuit & Waveforms

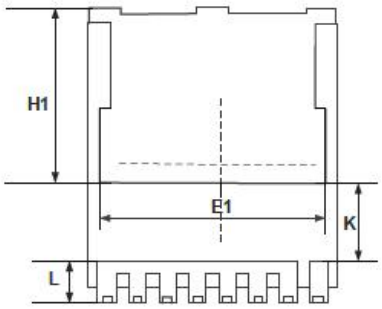
Package Dimensions TOLL-8L



TOP VIEW



SIDE VIEW



BOTTTOM VIEW

COMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	2.20	2.40
b	0.60	0.90
b1	9.70	9.90
c	0.40	0.60
D	10.20	10.60
D1	3.10	3.50
D2	4.45	4.75
E	9.70	10.10
E1	7.80BSC	
E2	0.50	0.70
e	1.200 BSC	
H	11.45	11.90
H1	6.75 BSC	
K	3.10 REF	
L	1.70	2.10
L1	0.60	0.80
L2	0.50	0.70
θ	10° REF	

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