Features

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

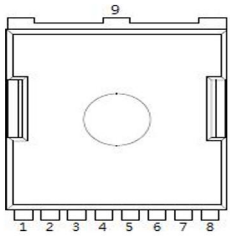
Bvdss	Rdson	ID
60V	1.25mΩ	400A

Application

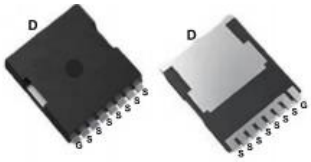
RoHS

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

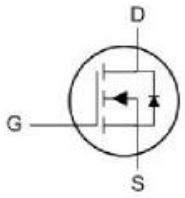
Package



1.Marking and pin assignment



2. TOLL-8L top view



3.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, V_{GS} @ 10V(1)	T_C = 25℃	I_D	400	A
	T_C = 100℃	I_D	268	A
Pulsed Drain Current (2)		I_{DM}	1512	A
Power Dissipation(4)	T_C = 25℃	P_d	454.5	W
Single Pulse Avalanche Energy		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	$R_{\theta JA}$	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	
S400N06HTL	S400N06HTL	1	9	2,3,4,5,6,7,8	Tape Reel

P-Channel Electrical Characteristics (T_j=25℃unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	V(br)dss	I_d= 250μA, V_{gs} = 0V	60	-	-	V
Drain-Source Leakage Current	Idss	V_{DS}=60V, V_{GS}=0V,TJ=25°C	-	-	1.0	μA
		V_{DS}=60V,V_{GS}=0V,TJ=100°C	-	-	100	μA
Gate to Source Leakage Current	Igss	V_{GS}=±20V , V_{DS}=0V	-	-	± 100	nA
Gate Threshold Voltage	Vgs(th)	V_{GS}=V_{DS} , I_D =250uA	2	2.9	4	V
Static Drain-Source On-Resistance(3)	Rds(on)	V_{GS} = 10V, I_D =20A	-	1.25	1.55	mΩ
Forward Transconductance(4)	gfs	VDs=10V, I_D=20A	-	62	-	S
Gate resistance	Rg	f=1.0MHz	-	2.6	-	Ω
Input Capacitance	Ciss	V_{DS} = 30V, V_{GS} =0V, f =1MHz	-	5990	-	pF
Output Capacitance	Coss		-	2257	-	pF
Reverse Transfer Capacitance	Crss		-	86	-	pF
Turn-ON Delay Time	td(on)	V_{GS} =10V, V_{DD} =30V, R_G = 3Ω, I_D= 20A	-	23	-	ns
Rise Time	tr		-	15	-	ns
Turn-OFF Delay Time	td(off)		-	129	-	ns
Fall Time	tf		-	28	-	ns
Total Gate Charge	Qg	V_{GS} = 10V, V_{DS} = 30V, I_D=20A	-	102	-	nC
Gate Source Charge	Qgs		-	24.6	-	nC
Gate Drain Charge	Qgd		-	28.2	-	nC
Body Diode Reverse Recovery Time	Trr	I_F = 20A, dI/dt=100A/μs	-	80	-	ns
Body Diode Reverse Recovery Charge	Qrr		-	114	-	nC
Maximum Continuous Drain to Source Diode Forward Current	Is		-		400	A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, Is=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%.

5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

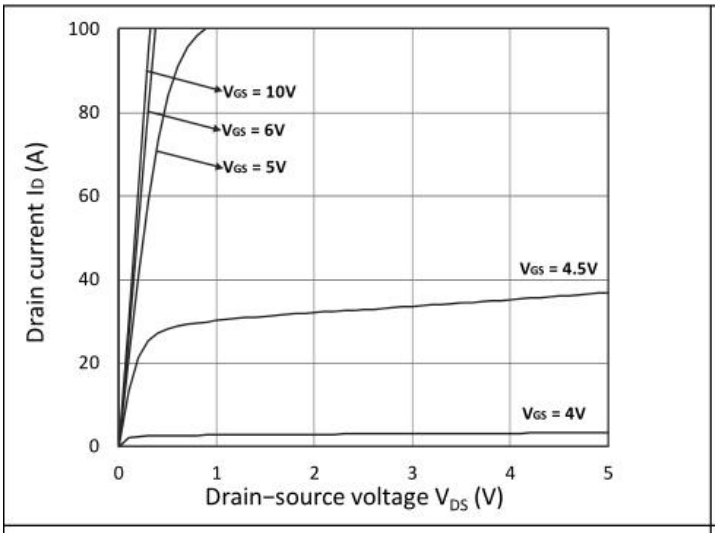


Figure 1. Output Characteristics

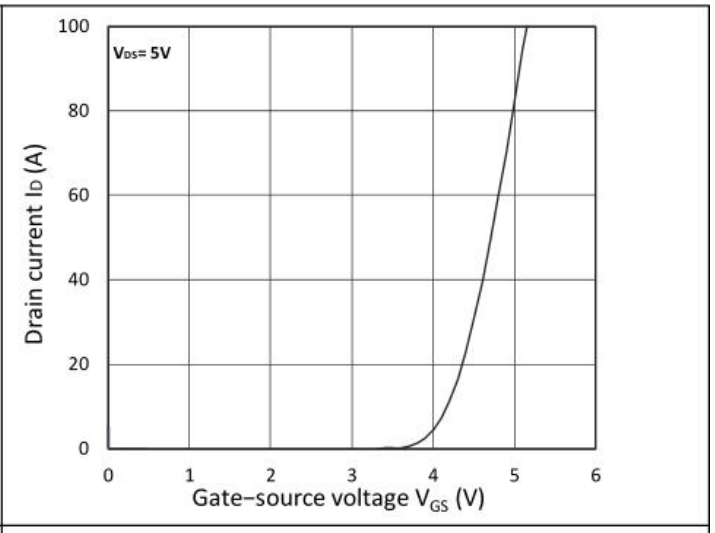


Figure 2. Transfer Characteristics

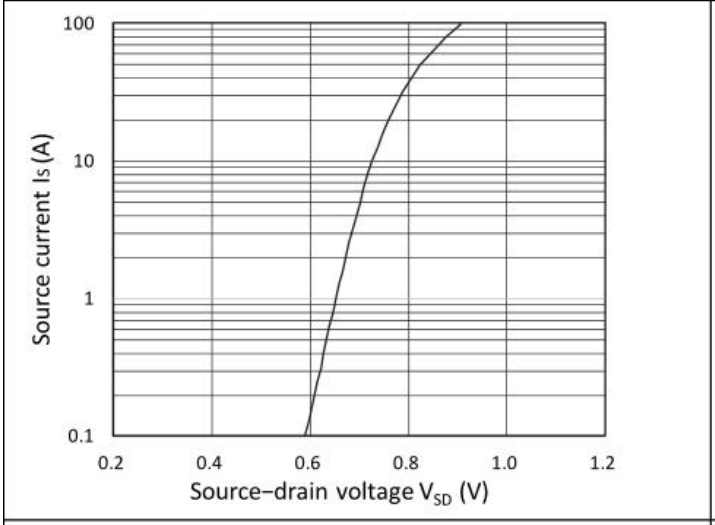


Figure 3. Forward Characteristics of Reverse

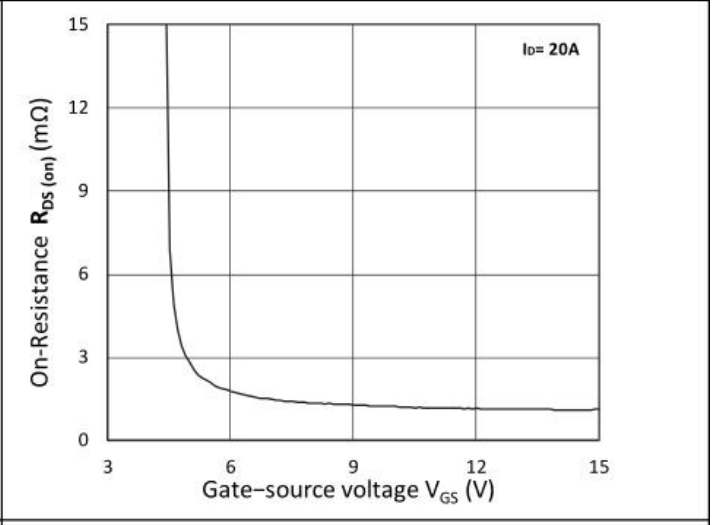


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

Typical Characteristics

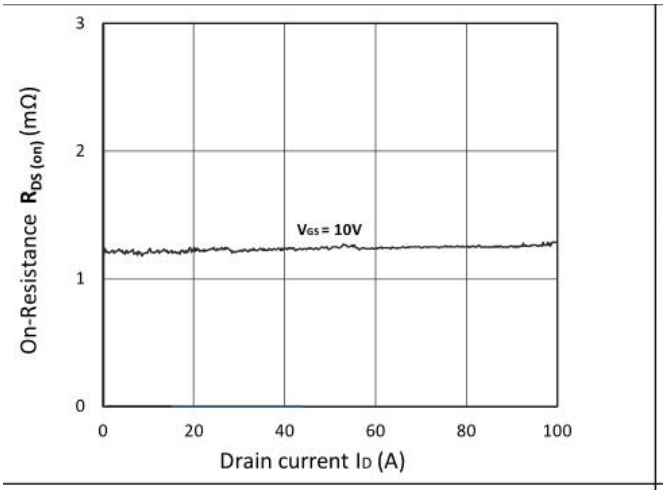


Figure 5. $R_{DS(ON)}$ vs. I_D

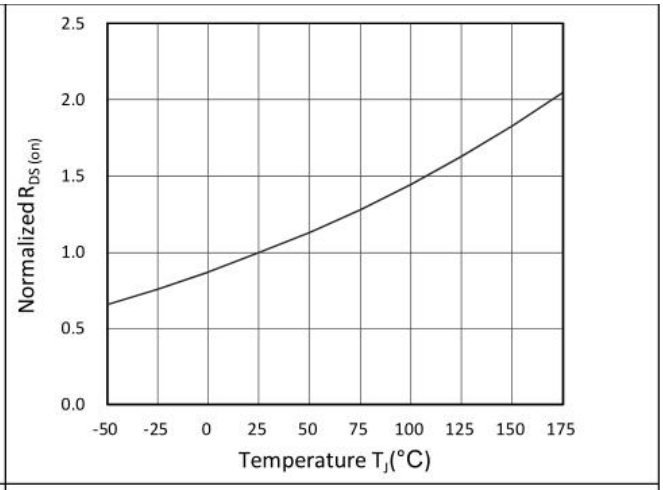


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

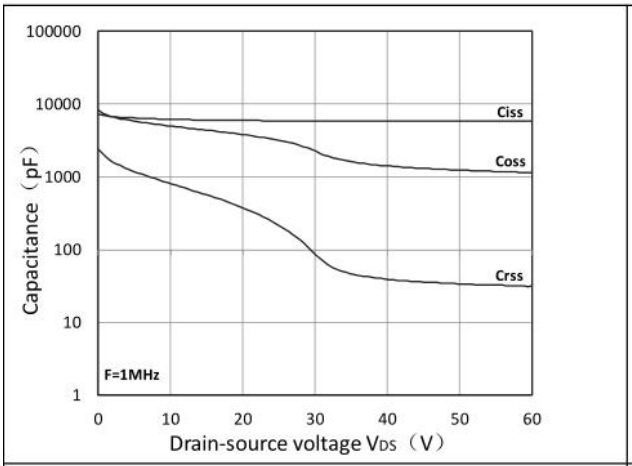


Figure 7. Capacitance Characteristics

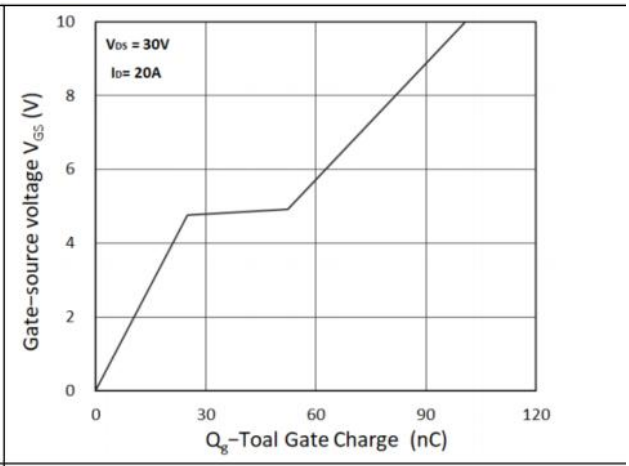


Figure 8. Gate Charge Characteristics

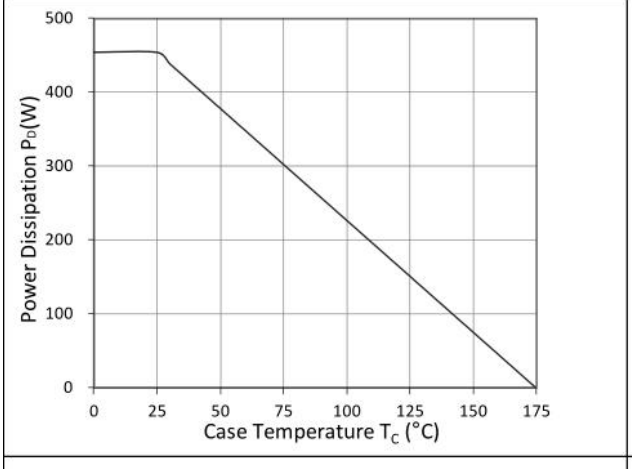


Figure 9. Power Dissipation

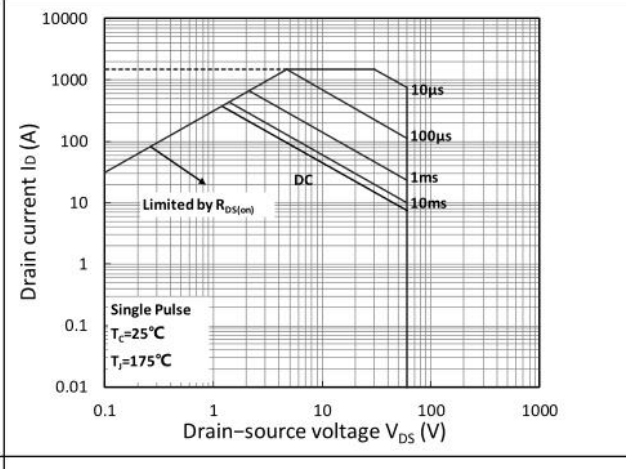


Figure10. Safe Operating Area

Typical Characteristics

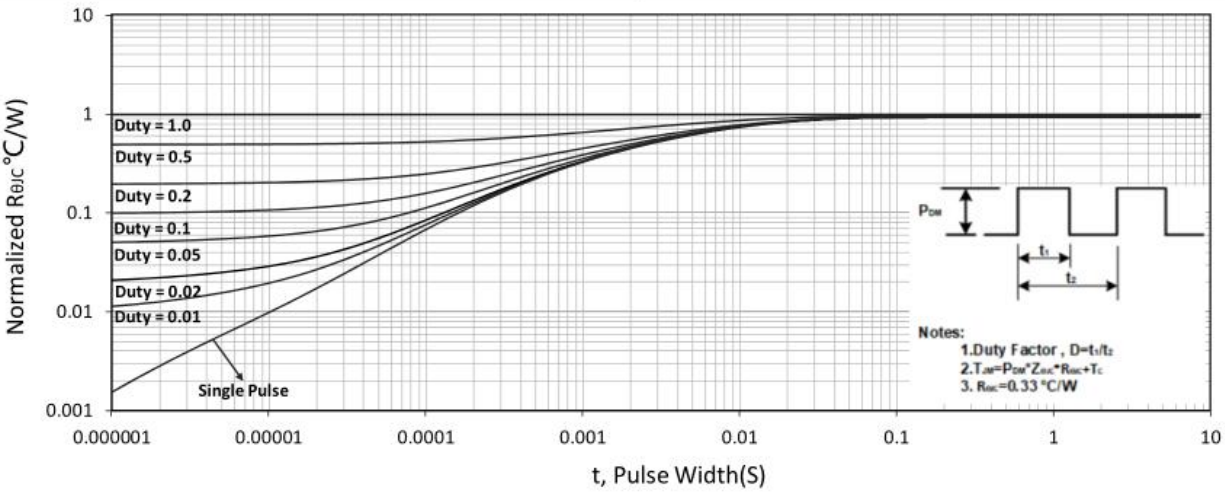


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

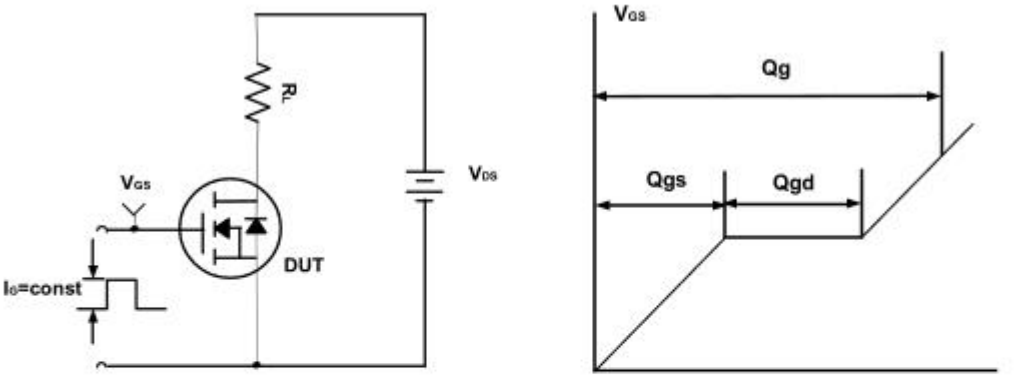


Figure A. Gate Charge Test Circuit & Waveforms

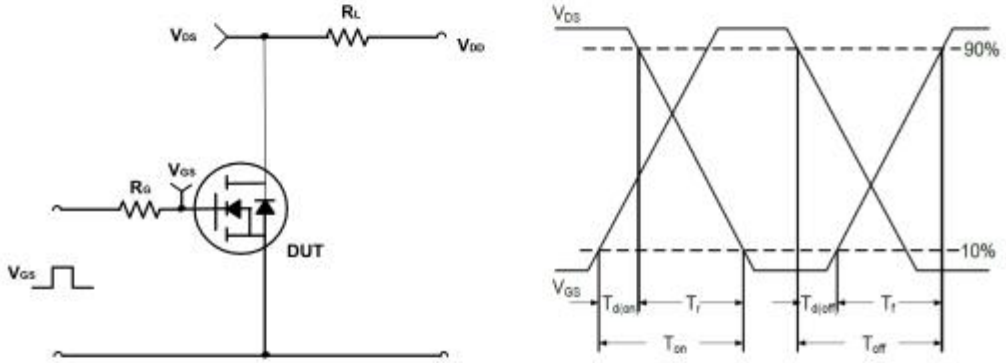


Figure B. Switching Test Circuit & Waveforms

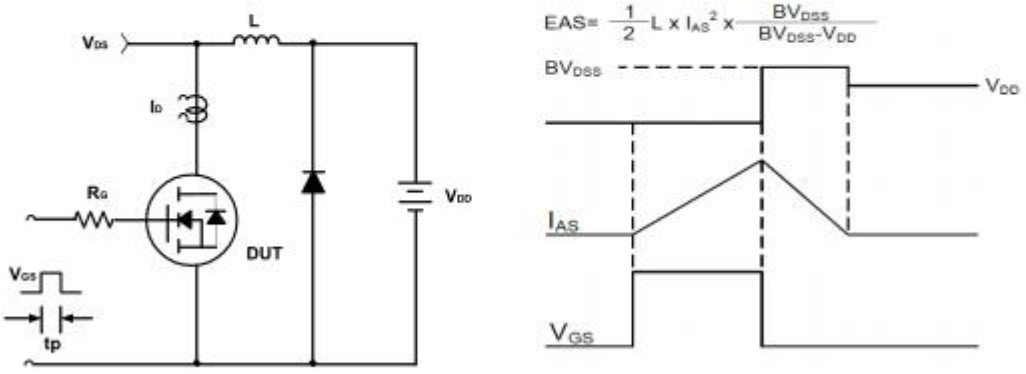
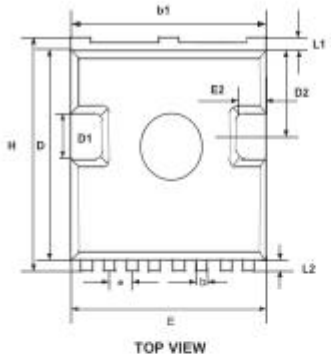
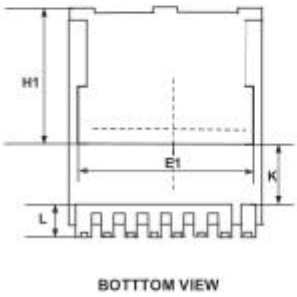


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Package Dimensions

➢ TOLL-8





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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