

Features	<i>Bvdss</i>	<i>Rdson</i>	<i>ID</i>
	60V	1.25mΩ	400A
<ul style="list-style-type: none"> ➤ Split Gate Trench MOSFET technology ➤ Excellent package for heat dissipation ➤ High density cell design for low RDS(ON) 	Application <ul style="list-style-type: none"> ➤ 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°C 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°C	I _D	400	A
	T _C = 100°C	I _D	268	A
Pulsed Drain Current (2)	I _{DM}	1512	A	
Power Dissipation(4)	P _d	454.5	W	
Single Pulse Avalanche Energy	EAS	500	mJ	
Junction Temperature	T _J	-55~+175	°C	
Storage Temperature	T _{STG}	-55~+175	°C	

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient	R _{θJA}	39	°C/W
Thermal Resistance Junction-Case	R _{θJC}	0.33	°C/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°C unless otherwise noted)

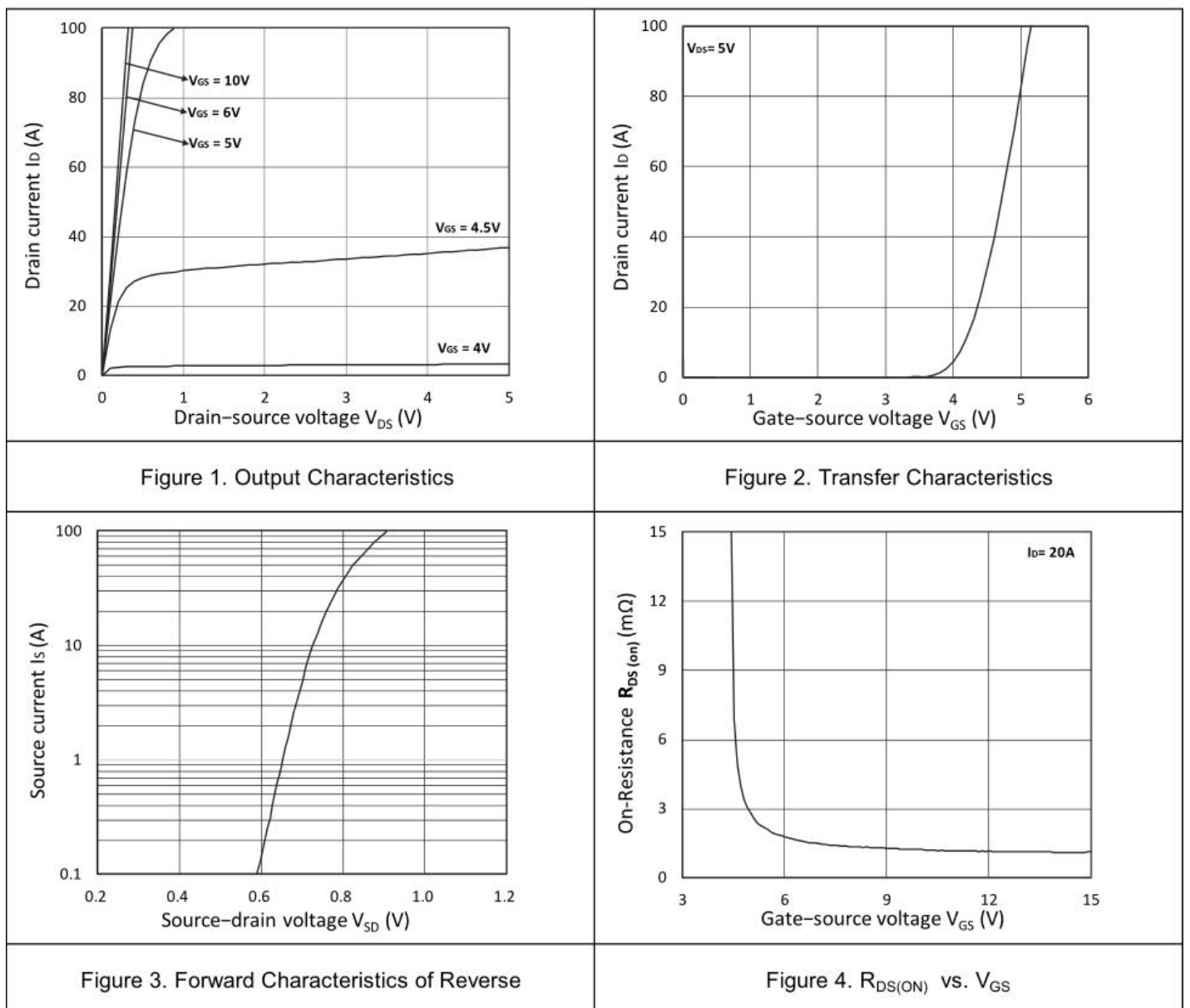
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	V(br)dss	I _d = 250μA, V _{gs} = 0V	60	-	-	V
Drain-Source Leakage Current	I _{dss}	V _{DS} =60V, V _{GS} =0V, T _J =25°C	-	-	1.0	μA
		V _{DS} =60V, V _{GS} =0V, T _J =100°C	-	-	100	μA
Gate to Source Leakage Current	I _{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(3)	R _{ds(on)}	V _{GS} = 10V, I _D =20A	-	1.25	1.55	mΩ
Forward Transconductance(4)	g _{fs}	V _{DS} =10V, I _D =20A	-	62	-	S
Gate resistance	R _g	f=1.0MHz	-	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)}		-	23	-	ns
Rise Time	t _r	V _{GS} =10V, V _{DD} =30V, R _G = 3Ω, I _D = 20A	-	15	-	ns
Turn-OFF Delay Time	t _{d(off)}		-	129	-	ns
Fall Time	t _f		-	28	-	ns
Total Gate Charge	Q _g		V _{GS} = 10V, V _{DS} = 30V, I _D =20A	-	102	-
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	V _{SD}	V _{GS} =0V, I _S =20A	-		1.2	V



Notes:

- 1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=175^{\circ}C$.
- 2. The test condition is $V_{DD}=90V$, $V_{GS}=10V$, $L=0.4mH$, $I_{AS}=50A$.
- 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 $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics



Typical Characteristics

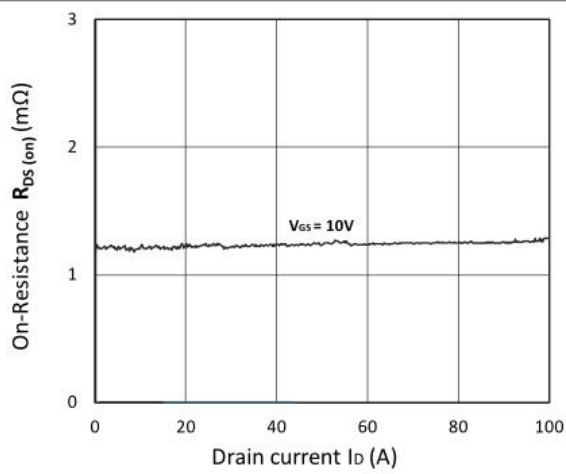


Figure 5. $R_{DS(on)}$ vs. I_D

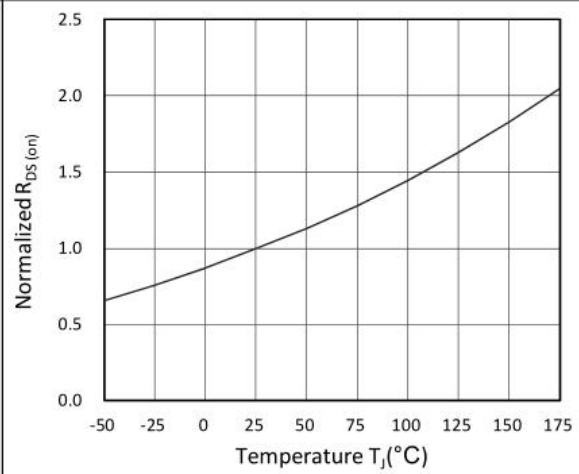


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

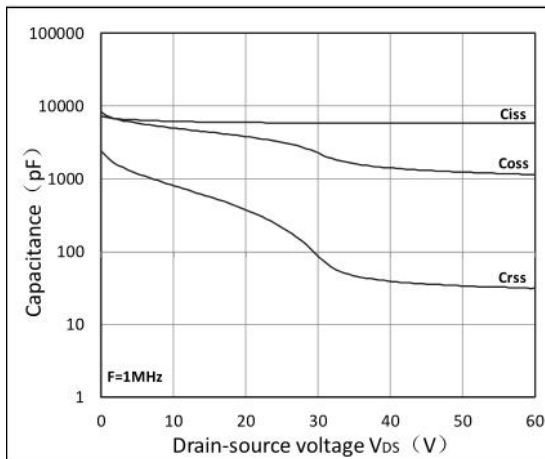


Figure 7. Capacitance Characteristics

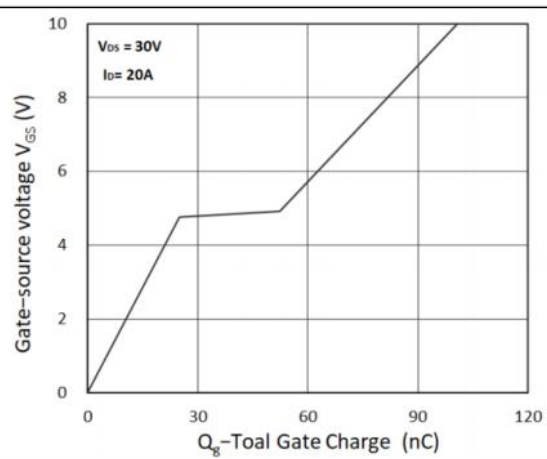


Figure 8. Gate Charge Characteristics

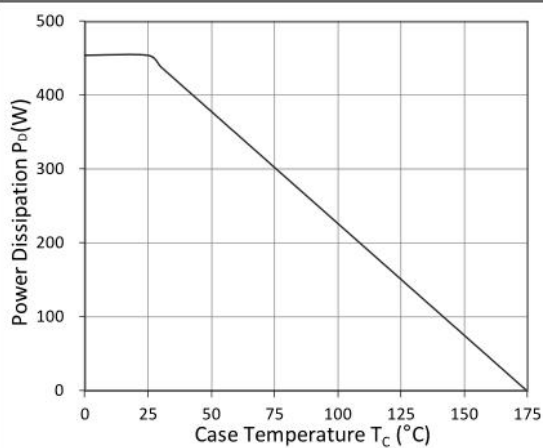


Figure 9. Power Dissipation

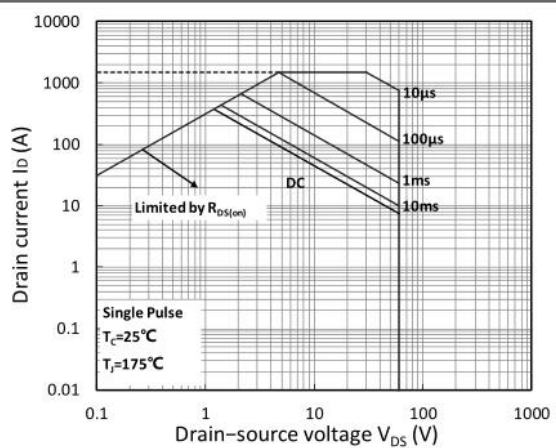


Figure 10. Safe Operating Area

Typical Characteristics

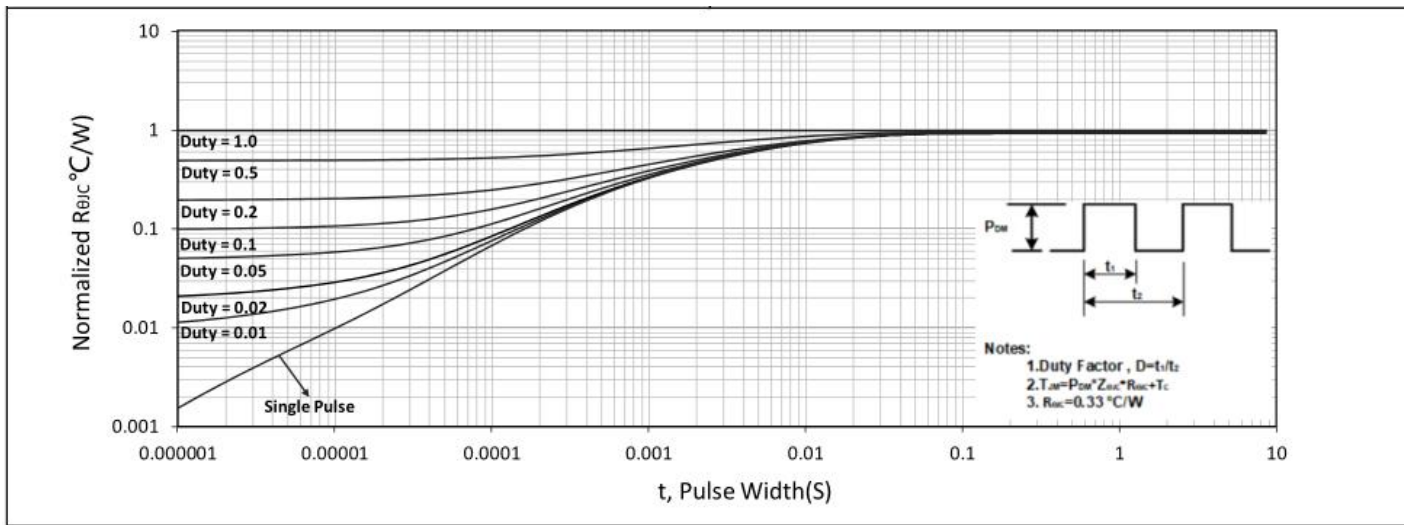


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

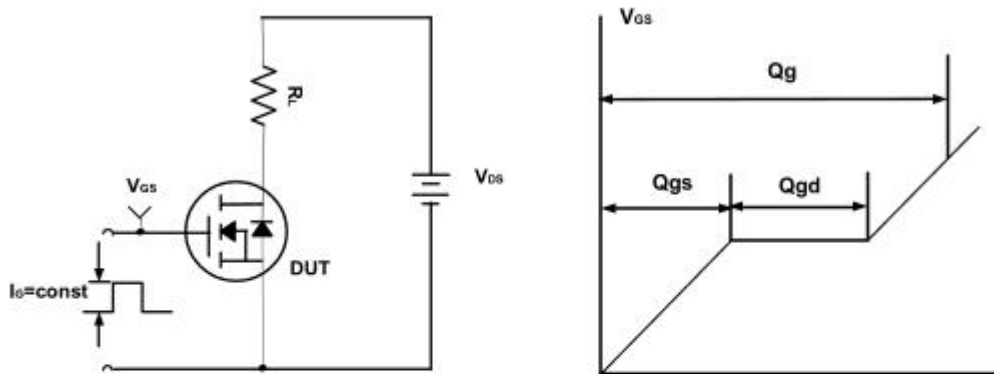


Figure A. Gate Charge Test Circuit & Waveforms

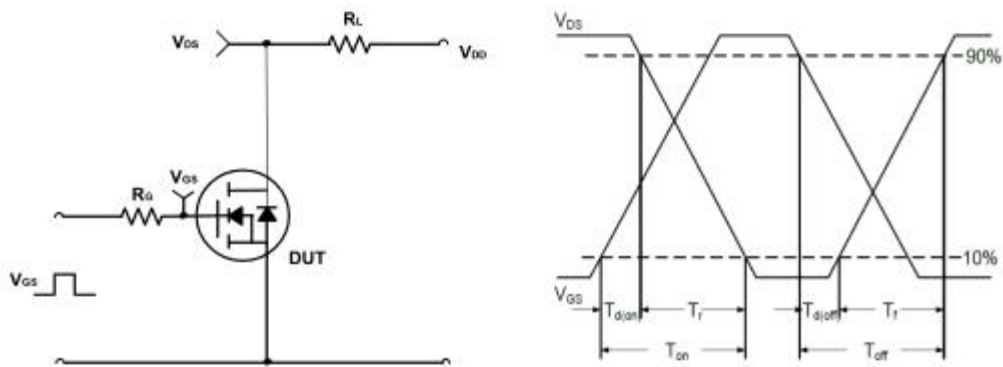


Figure B. Switching Test Circuit & Waveforms

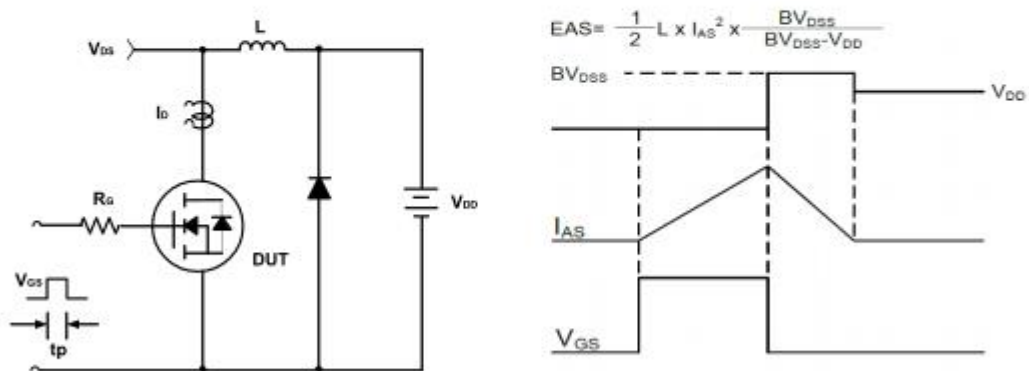
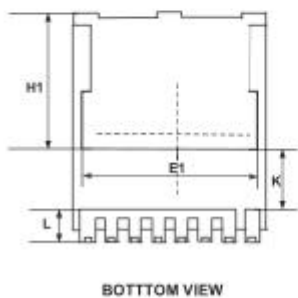
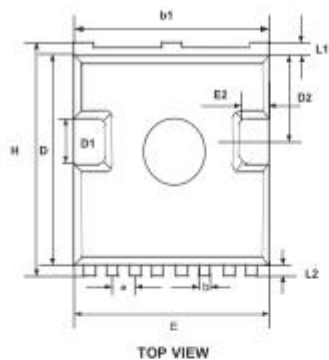


Figure C. Unclamped Inductive Switching Circuit & Waveforms

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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