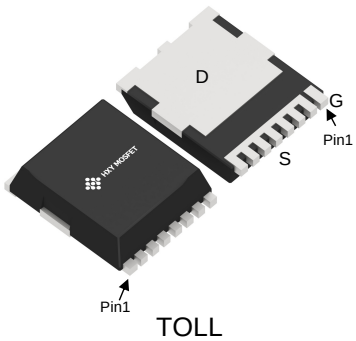
Description

The HXYG500N06L use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness.

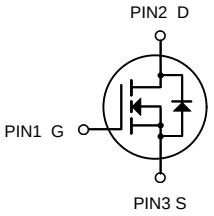


TOLL

General Features

V_{DS} = 60V I_D = 500A

$R_{DS(ON)}$ < 1.2mΩ @ V_{GS}=10V



N-Channel MOSFET

Application

Battery protection

Load switch

Uninterruptible power supply

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
HXYG500N06L	TOLL	HXY MOSFET	2000

Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	500	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	354	A
I_{DM}	Pulsed Drain Current[2]	2000	A
EAS	Single Pulse Avalanche Energy[3]	1216.8	mJ
P_D	Total Power Dissipation[4]	349	W
T_{STG} T_J	Storage Temperature Range	-55 to 150	℃
I_{AS}	Avalanche Current	78	A
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	0.43	℃/W
$R_{\theta JA}$	ThermalResistanceJunctiontoAmbient[1]	40	℃/W

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	60	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	---	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=25A	---	0.9	1.2	mΩ
		V_{GS}=4.5V , I_D=25A	---	---	---	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.5	2.9	3.5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=60V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=60V, V_{GS}=0V , T_J=100℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=25A	---	95	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	3	---	Ω
Q_g	Total Gate Charge	V_{DS}=30V , V_{GS}=10V , I_D=25A	---	150	---	nC
Q_{gs}	Gate-Source Charge		---	37	---	
Q_{gd}	Gate-Drain Charge		---	41	---	
$T_{d(on)}$	Turn-On Delay Time	VGS=10V, VDD=30V, RG=3Ω, ID=25A	---	22.8	---	ns
T_r	Rise Time		---	30.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	107.4	---	
T_f	Fall Time		---	54	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , f=1MHz	---	9200	---	pF
C_{oss}	Output Capacitance		---	2250	---	
C_{rss}	Reverse Transfer Capacitance		---	90	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	500	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=25A , T_J=25℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time	IF=25A , di/dt=100A/μs , T_J=25℃	---	96	---	nS
Q_{rr}	Reverse Recovery Charge		---	134.9	---	nC

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=175°C.
2. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.4mH, I_{AS}=78A.
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

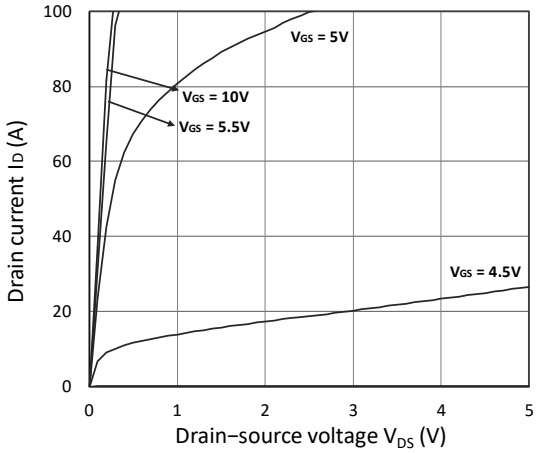


Figure 1. Output Characteristics

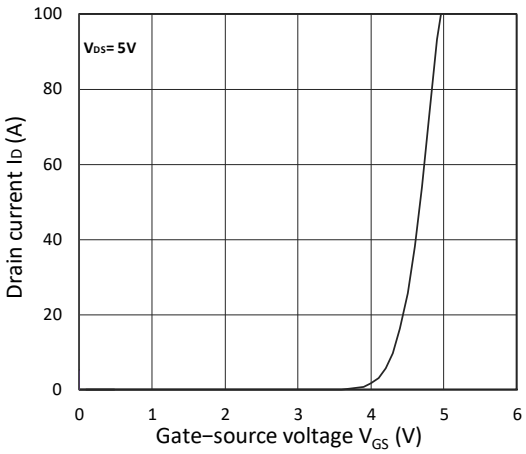


Figure 2. Transfer Characteristics

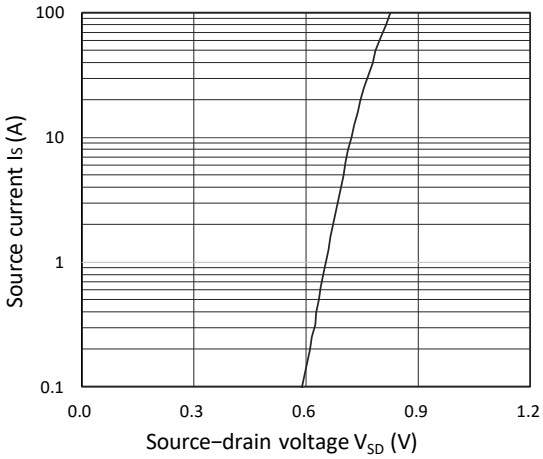


Figure 3. Forward Characteristics of Reverse

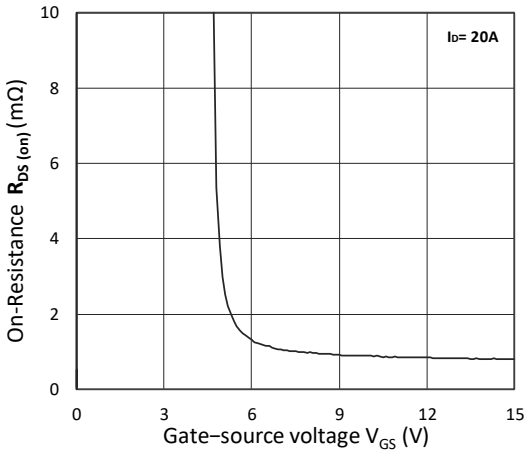


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

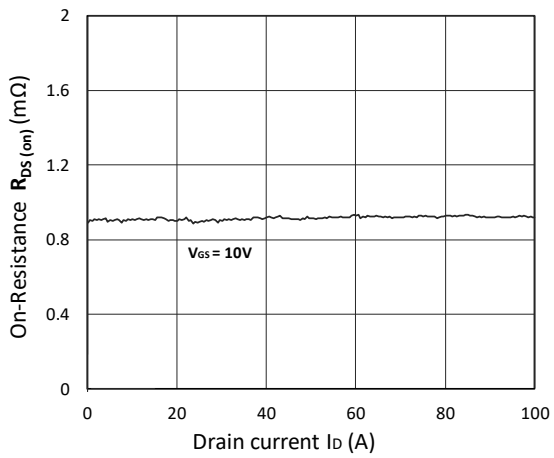


Figure 5. $R_{DS(ON)}$ vs. I_D

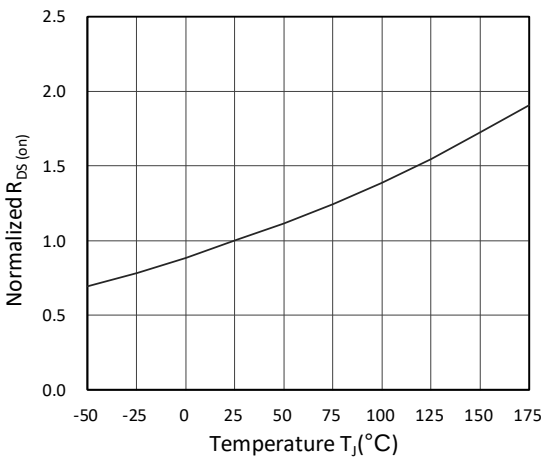


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

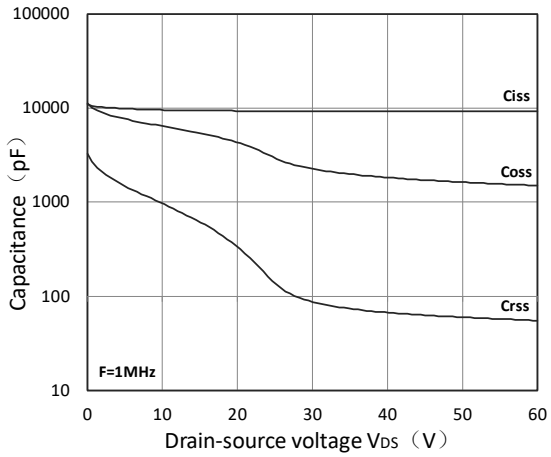


Figure 7. Capacitance Characteristics

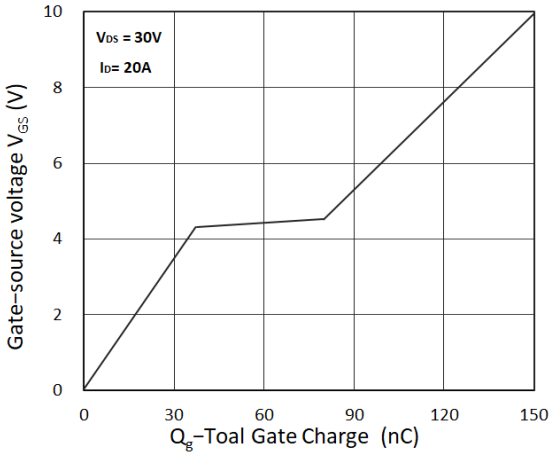


Figure 8. Gate Charge Characteristics

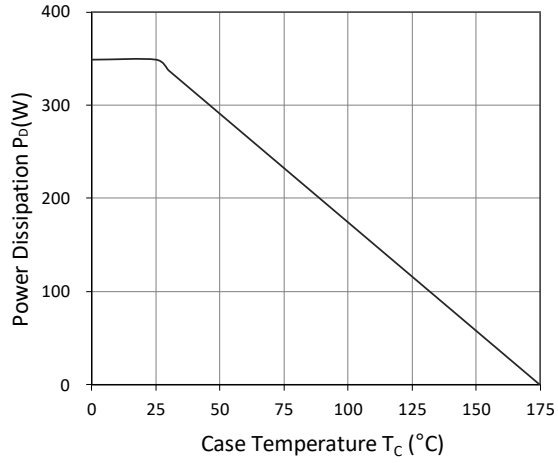


Figure 9. Power Dissipation

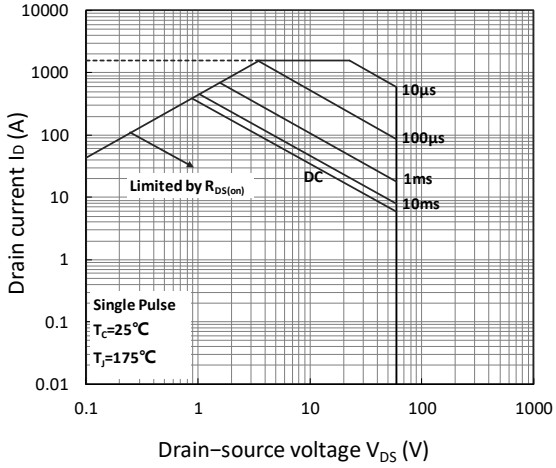


Figure10. Safe Operating Area

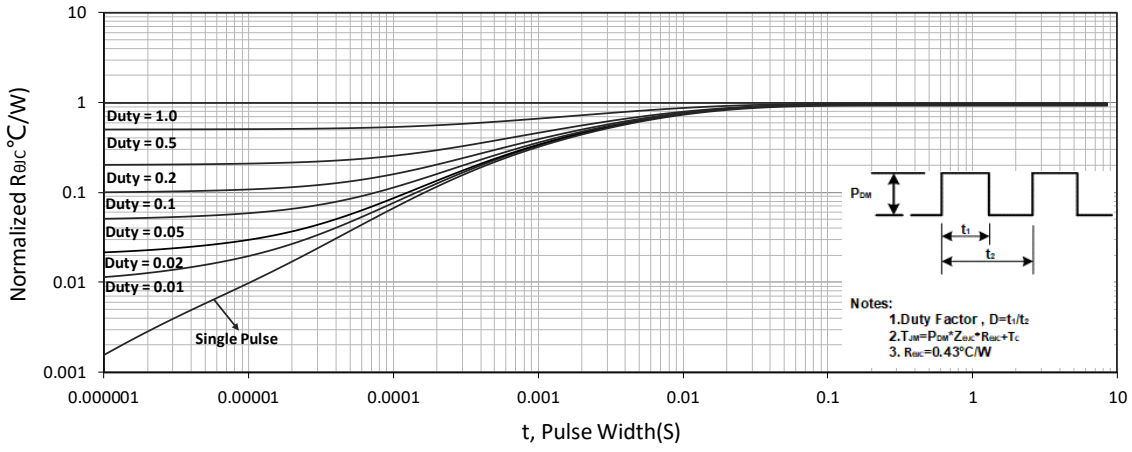
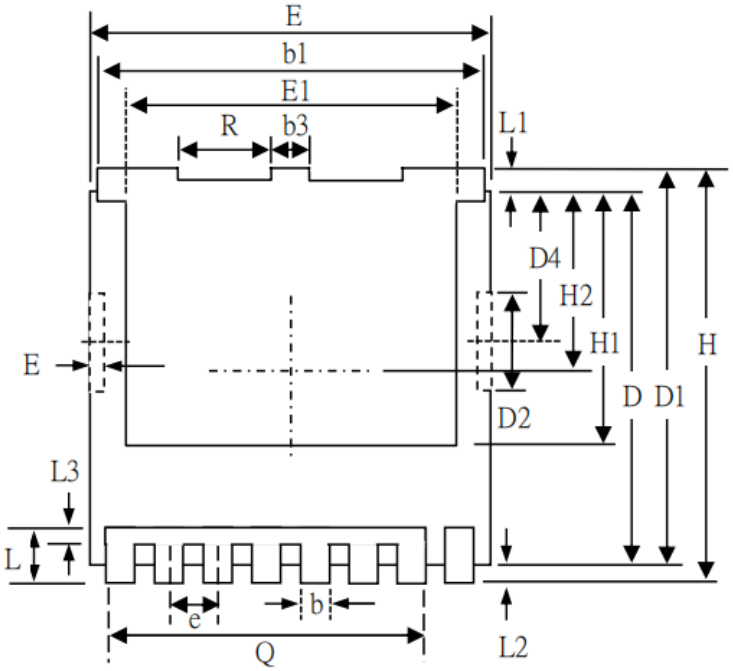
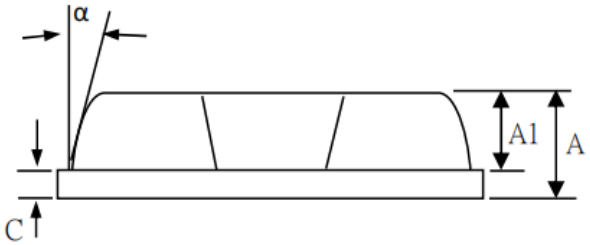


Figure 11. Normalized Maximum Transient Thermal Impedance

TOLL Package Information



BACKSIDE VIEW



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	

1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.

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