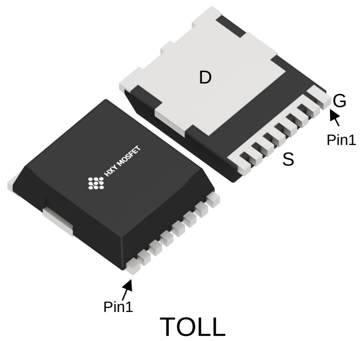
General Description

The IPT015N10N5 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.

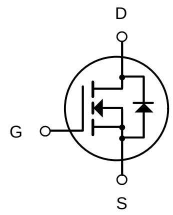


TOLL

General Features

V_{DS} = 100V I_D = 350A

$R_{DS(ON)}$ < 2mΩ @ V_{GS}=10V



N-Channel MOSFET

Applications

Battery Protection

Power Distribution

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IPT015N10N5	TOLL	HXY MOSFET	2000

Absolute Maximum Ratings at Tj=25°C unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	312	A
	T_C=100°C		200	
Pulsed Drain Current[1]		I_{DM}	1248	A
Single Pulse Avalanche Energy[2]		EAS	1250	mJ
Total Power Dissipation	T_C=25°C	P_D	390.6	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C
Thermal Resistance from Junction-to-Ambient[3]		$R_{\theta JA}$	39	°C/W
Thermal Resistance from Junction-to-Case		$R_{\theta JC}$	0.32	°C/W

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

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100	-	-	V
Gate-body Leakage current		I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T_J=25°C	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	-	-	1	μA
	T_J=100°C			-	-	100	
Gate-Threshold Voltage		$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2	3	4	V
Drain-Source on-Resistance[4]		$R_{DS(on)}$	V_{GS} = 10V, I_D = 20A	-	1.4	2.0	mΩ
Forward Transconductance[4]		g_{fs}	V_{DS} = 10V, I_D =20A	-	84	-	S
Dynamic Characteristics[5]							
Input Capacitance		C_{iss}	V_{DS} = 50V, V_{GS} =0V, f =1MHz	-	14300	-	pF
Output Capacitance		C_{oss}		-	2120	-	
Reverse Transfer Capacitance		C_{rss}		-	50	-	
Gate Resistance		R_g	f=1MHz	-	2.8	-	Ω
Switching Characteristics[5]							
Total Gate Charge		Q_g	V_{GS} = 10V, V_{DS} = 50V, I_D= 20A	-	250	-	nC
Gate-Source Charge		Q_{gs}		-	53	-	
Gate-Drain Charge		Q_{gd}		-	77	-	
Turn-on Delay Time		$t_{d(on)}$	V_{GS} =10V, V_{DD} = 50V, R_G = 3Ω, I_D= 20A	-	41	-	ns
Rise Time		t_r		-	88	-	
Turn-off Delay Time		$t_{d(off)}$		-	163	-	
Fall Time		t_f		-	98	-	
Body Diode Reverse Recovery Time		t_{rr}	I_F=20A, di/dt = 100A/μs	-	106	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}		-	245	-	nC
Drain-Source Body Diode Characteristics							
Diode Forward Voltage[4]		V_{SD}	I_S = 20A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	T_C=25°C	I_S	-	-	-	312	A

Note:
1. The maximum current rating is package limited.
2. Repetitive rating; pulse width limited by max. junction temperature.
3. V_{DD}=32 V, R_G=25 Ω, L=0.5mH, starting T_j=25°C.
4. P_D is based on max. junction temperature, using junction-case thermal resistance.
5. The value of $R_{θJA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25°C .

Typical Characteristics

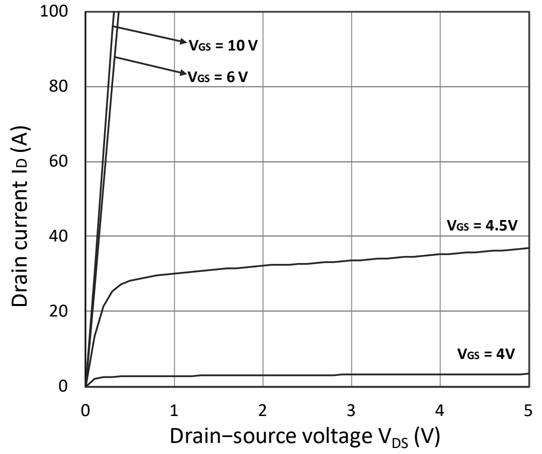


Figure 1. Output Characteristics

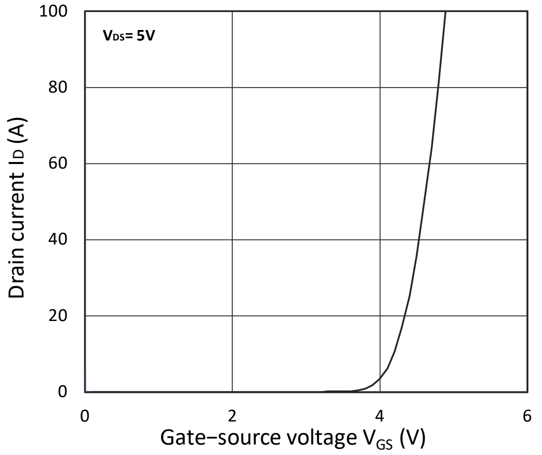


Figure 2. Transfer Characteristics

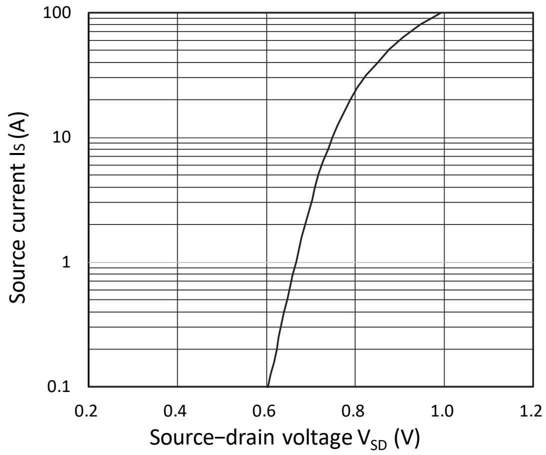


Figure 3. Forward Characteristics of Reverse

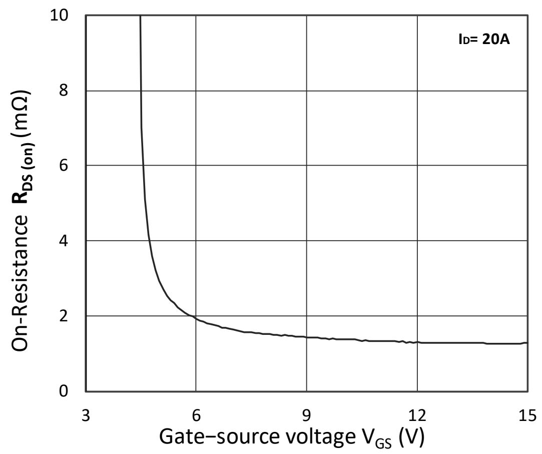


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

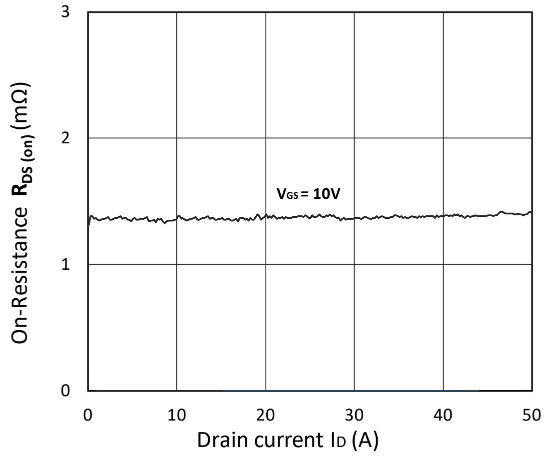


Figure 5. $R_{DS(ON)}$ vs. I_D

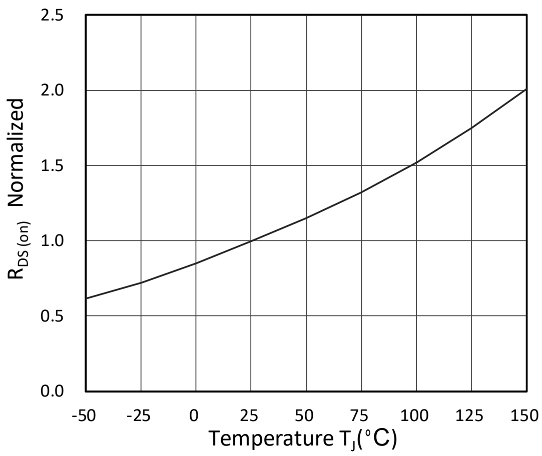


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

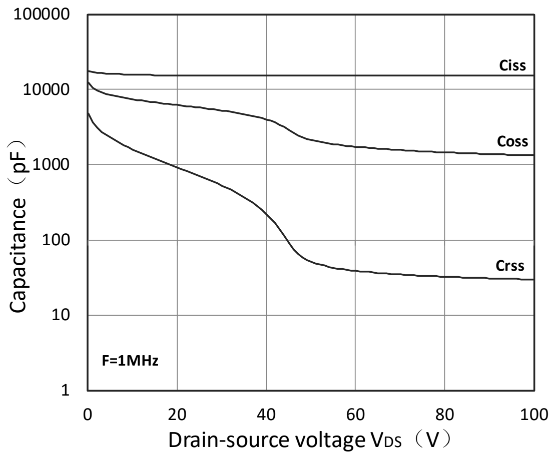


Figure 7. Capacitance Characteristics

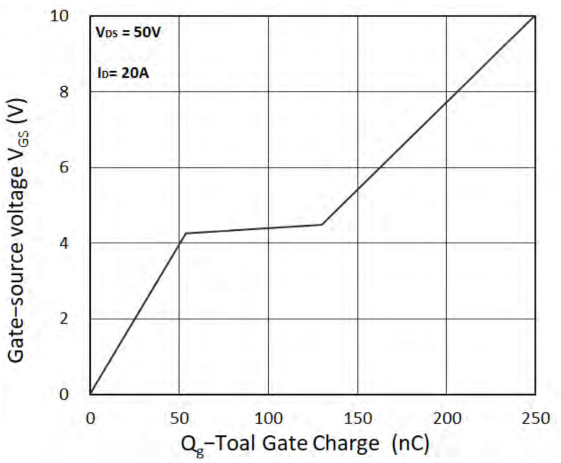


Figure 8. Gate Charge Characteristics

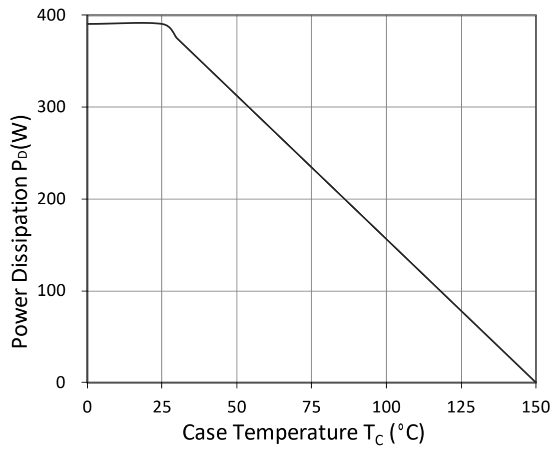


Figure 9. Power Dissipation

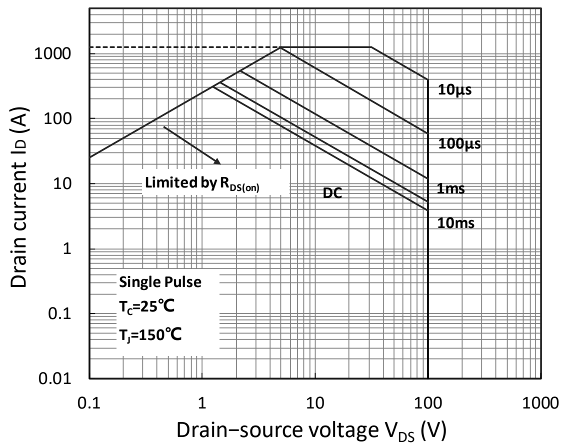


Figure10. Safe Operating Area

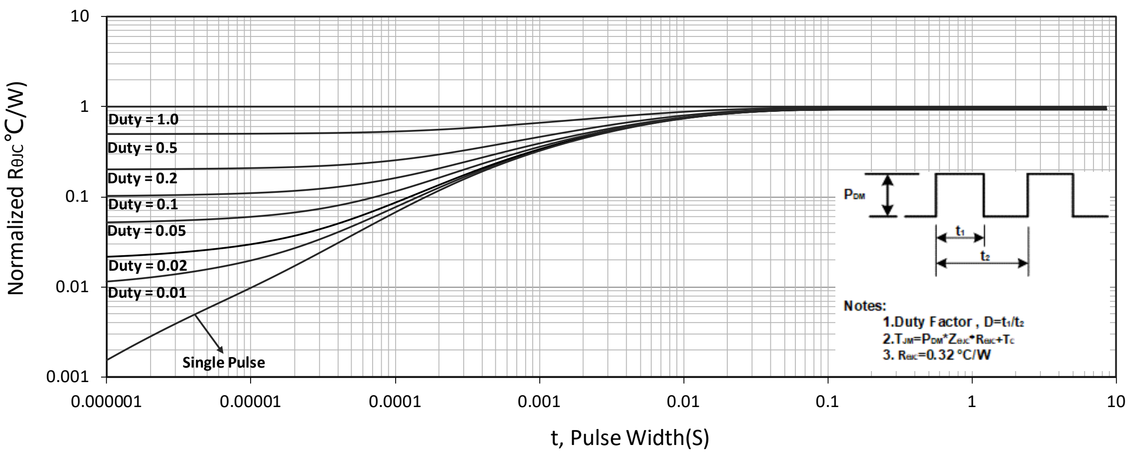


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

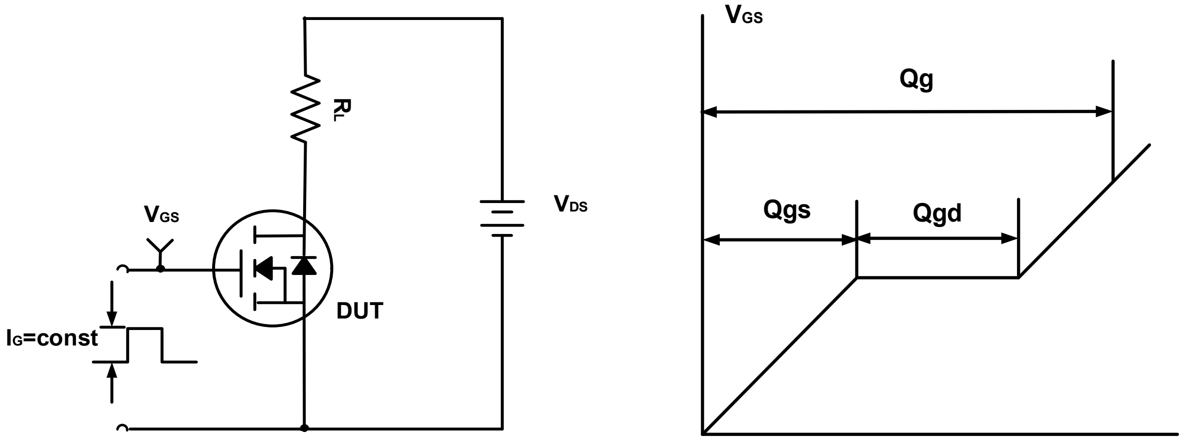


Figure A. Gate Charge Test Circuit & Waveforms

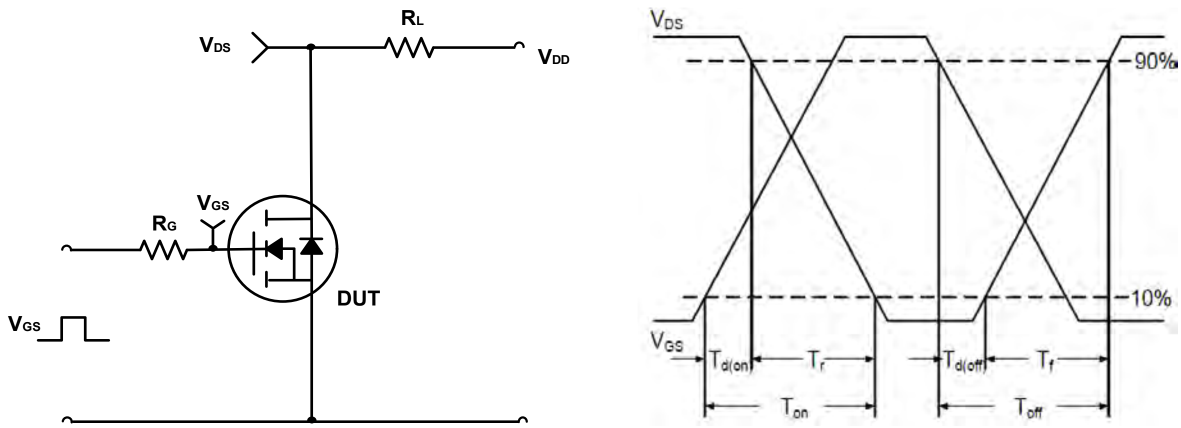


Figure B. Switching Test Circuit & Waveforms

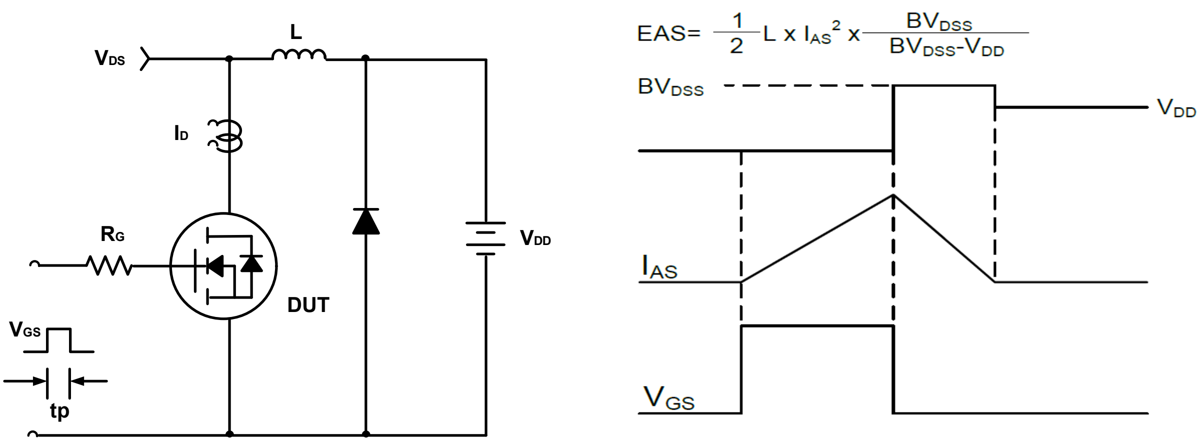
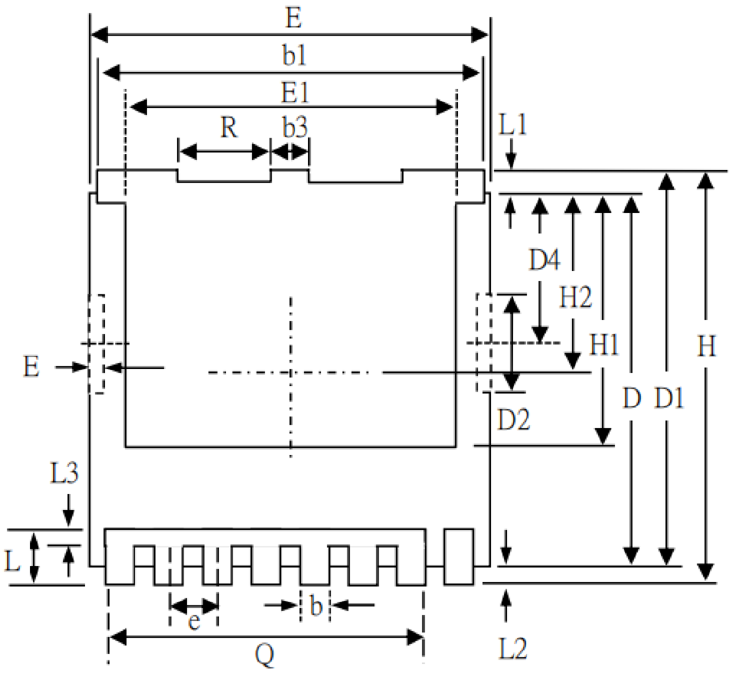
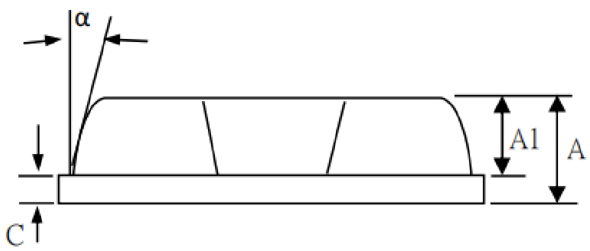


Figure C. Unclamped Inductive Switching Circuit & Waveforms

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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