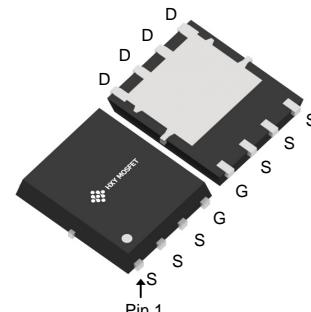




General Description

The IAUC100N10S5N040ATMA1 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 and suitable.

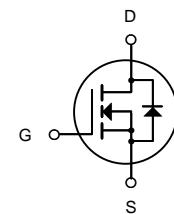


DFN5X6-8L

$V_{DS} = 100V$ $I_D = 120A$

$R_{DS(ON)} < 4.4m\Omega$ @ $V_{GS}=10V$

General Features



N-Channel MOSFET

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
IAUC100N10S5N040ATMA1	DFN5X6-8L	HXY MOSFET	5000

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	120	A
$I_D @ T_c=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	81	A
I_{DM}	Pulsed Drain Current	512	A
EAS	Single Pulse Avalanche Energy	486	mJ
I_{AS}	Avalanche Current	67	A
$P_D @ T_c=25^\circ C$	Total Power Dissipation	176	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JC}$	Thermal Resistance from Junction-to-Case	0.8	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	56	°C/W



Electrical Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_{\text{D}}=250\text{uA}$	100	---	---	V
$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $\text{I}_{\text{D}}=1\text{mA}$	---	---	---	$\text{V}/^\circ\text{C}$
$\text{R}_{\text{DS(ON)}}$	Static Drain-Source On-Resistance ²	$\text{V}_{\text{GS}}=10\text{V}$, $\text{I}_{\text{D}}=20\text{A}$	---	3.6	4.4	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}$, $\text{I}_{\text{D}}=20\text{A}$	---	---	---	
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}$, $\text{I}_{\text{D}}=250\text{uA}$	2.0	3.0	4.0	V
$\Delta \text{V}_{\text{GS(th)}}$	$\text{V}_{\text{GS(th)}}$ Temperature Coefficient		---	---	---	$\text{mV}/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$\text{V}_{\text{DS}}=80\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $T_J=25^\circ\text{C}$	---	---	1	uA
		$\text{V}_{\text{DS}}=80\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $T_J=100^\circ\text{C}$	---	---	100	
I_{GSS}	Gate-Source Leakage Current	$\text{V}_{\text{GS}}=\pm 20\text{V}$, $\text{V}_{\text{DS}}=0\text{V}$	---	---	± 100	nA
gfs	Forward Transconductance	$\text{V}_{\text{DS}}=5\text{V}$, $\text{I}_{\text{D}}=20\text{A}$	---	35	---	S
R_g	Gate Resistance	$\text{V}_{\text{DS}}=0\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	1.6	---	Ω
Q_g	Total Gate Charge	$\text{V}_{\text{DS}}=50\text{V}$, $\text{V}_{\text{GS}}=10\text{V}$, $\text{I}_{\text{D}}=20\text{A}$	---	69	---	nC
Q_{gs}	Gate-Source Charge		---	24	---	
Q_{gd}	Gate-Drain Charge		---	18.5	---	
$\text{T}_{\text{d(on)}}$	Turn-On Delay Time	$\text{V}_{\text{GS}}=10\text{V}$, $\text{VDD}=50\text{V}$, $\text{RG}=3\Omega$, $\text{ID}=20\text{A}$	---	18.0	---	ns
T_r	Rise Time		---	23	---	
$\text{T}_{\text{d(off)}}$	Turn-Off Delay Time		---	37	---	
T_f	Fall Time		---	15.7	---	
C_{iss}	Input Capacitance	$\text{V}_{\text{DS}}=50\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	4102	---	pF
C_{oss}	Output Capacitance		---	592	---	
C_{rss}	Reverse Transfer Capacitance		---	19.8	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_s	Continuous Source Current ^{1,5}	$\text{V}_G=\text{V}_D=0\text{V}$, Force Current	---	---	120	A
V_{SD}	Diode Forward Voltage ²	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_{\text{S}}=1\text{A}$, $T_J=25^\circ\text{C}$	---	---	1.2	V

Note :

1. The data is tested by a surface mounted on a 1inch^2 FR-4 board with 2OZ copper.

2. The data is tested by a pulsed pulse width $\leq 300\text{us}$ duty cycle $\leq 2\%$.

3. The EAS data shows Max. Rating at the test condition as $T_J = 25^\circ\text{C}$, $L = 3.0\text{mH}$, $\text{IAS} = 18\text{A}$, $\text{VGS} = 10\text{V}$, $\text{VDD} = 50\text{V}$; 100% test at $L = 0.1\text{mH}$, $\text{IAS} =$

4. The power dissipation is limited by 150°C junction temperature

5. The data is theoretically the same as I_{DSS} and I_{DSS} in real applications should be limited by total power dissipation.



Typical Characteristics

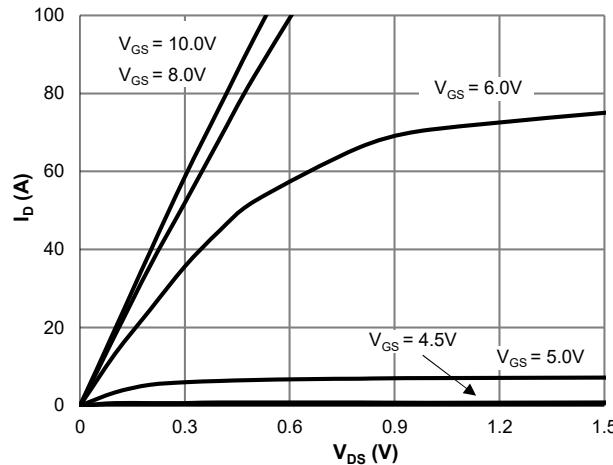


Figure 1: Saturation Characteristics

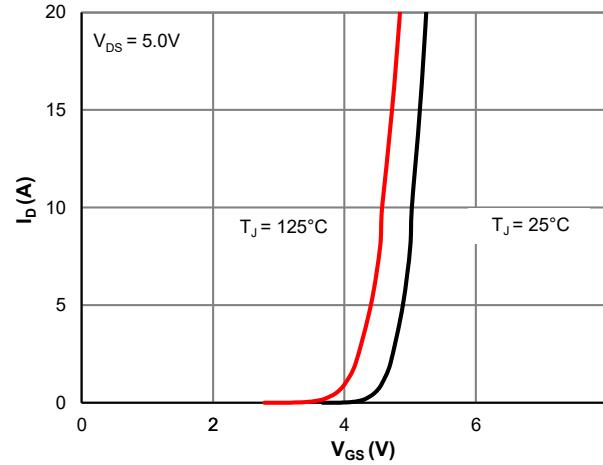


Figure 2: Transfer Characteristics

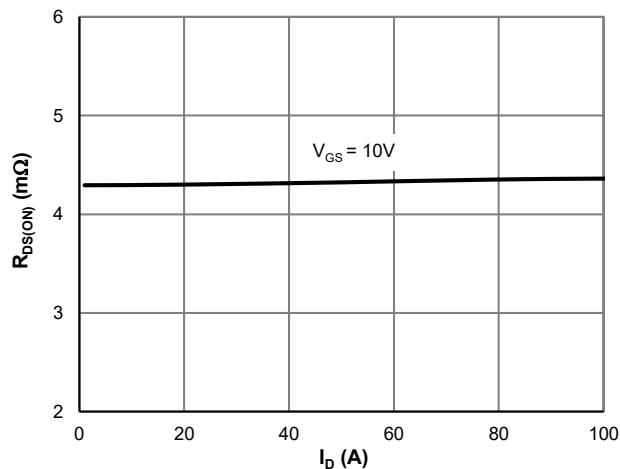


Figure 3: $R_{DS(ON)}$ vs. Drain Current

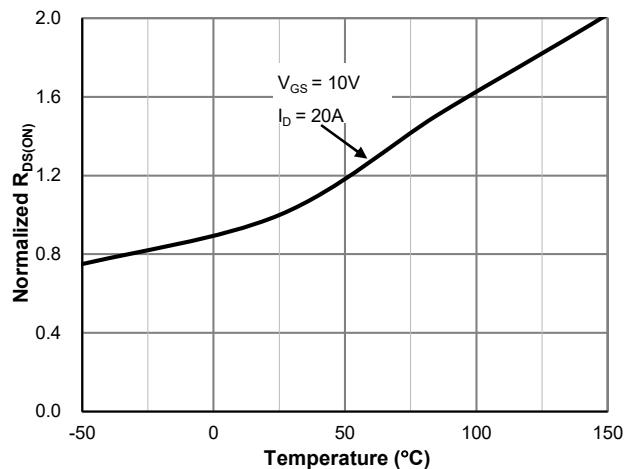


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

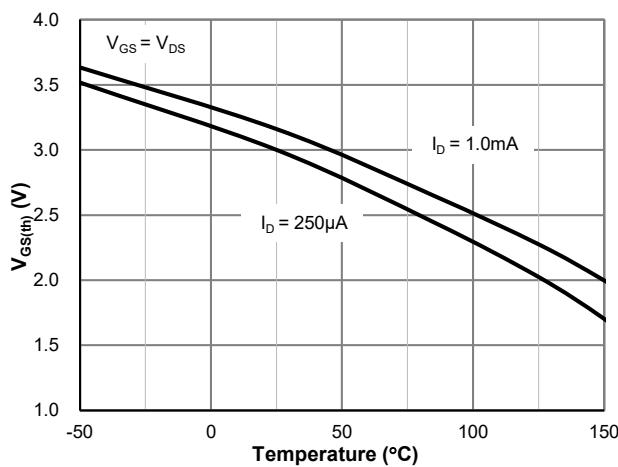


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

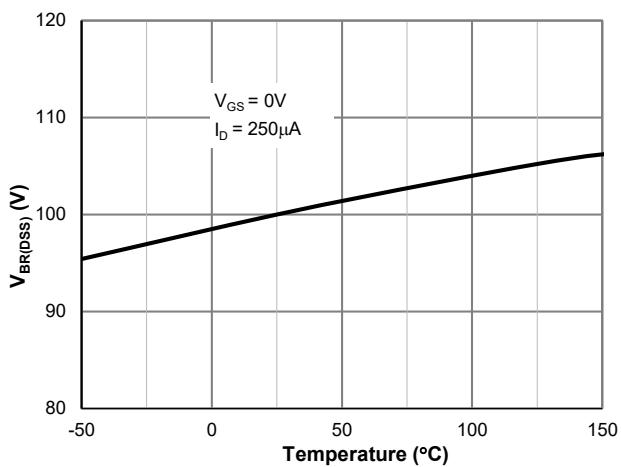


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

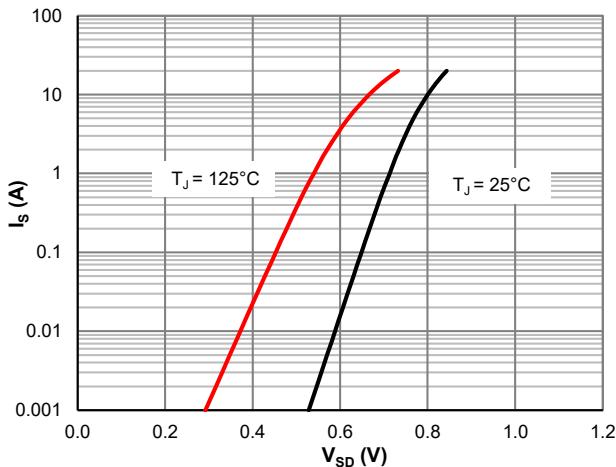


Figure 7: Body-Diode Characteristics

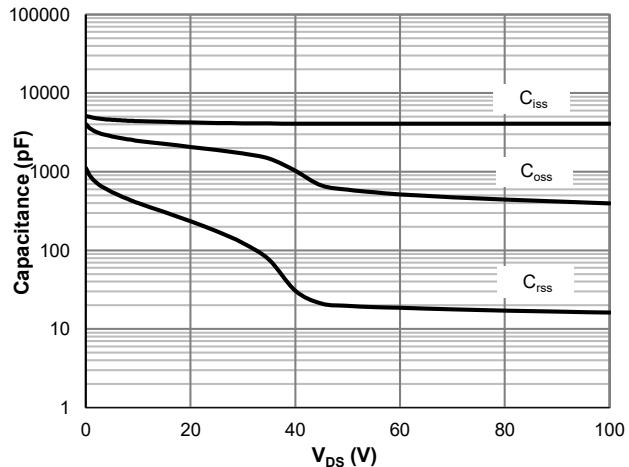


Figure 8: Capacitance Characteristics

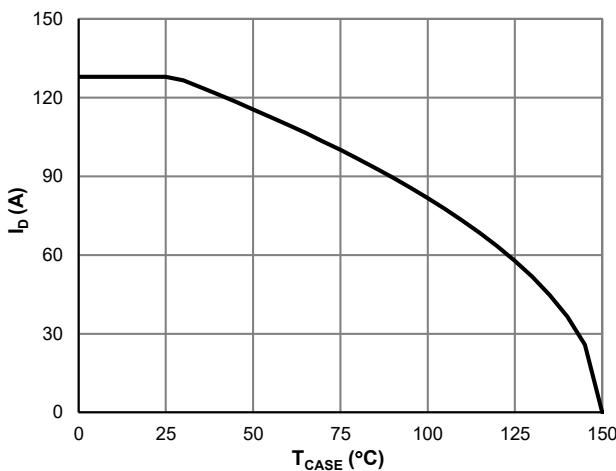


Figure 9: Current De-rating

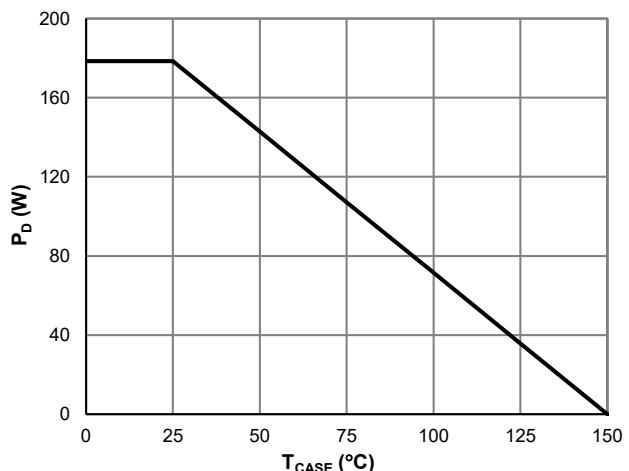


Figure 10: Power De-rating

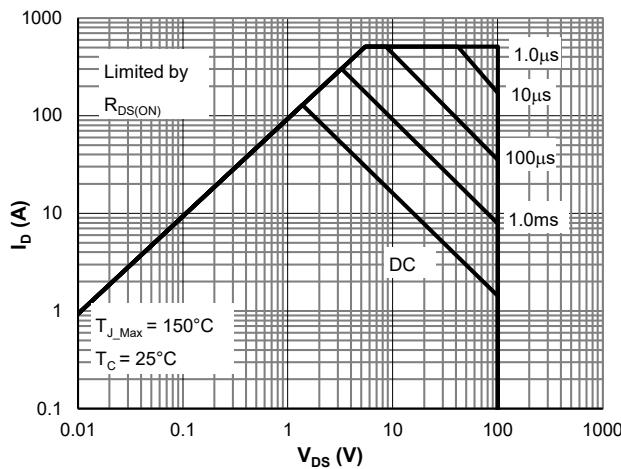


Figure 11: Maximum Safe Operating Area

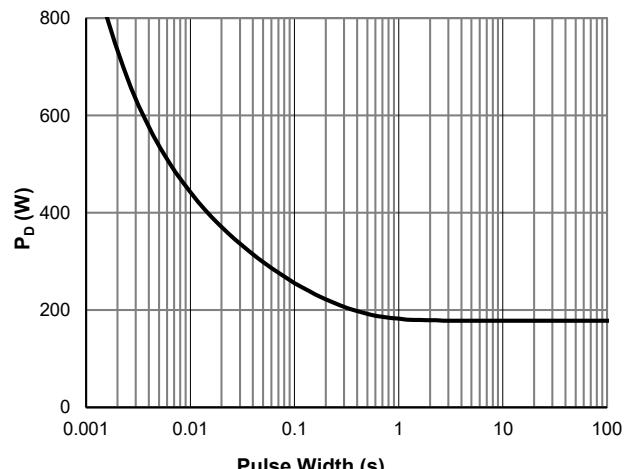


Figure 12: Single Pulse Power Rating, Junction-to-Case

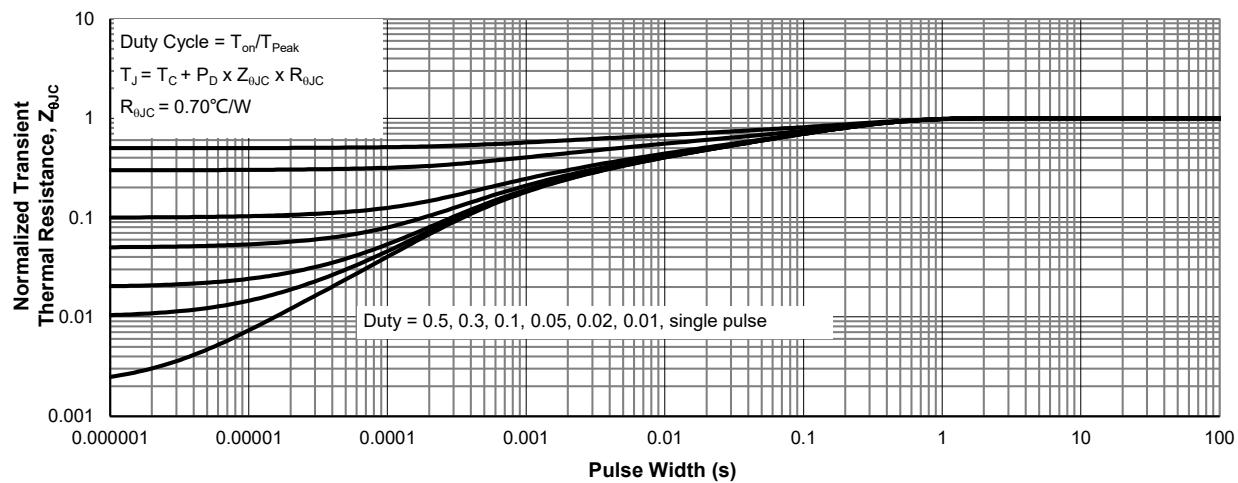
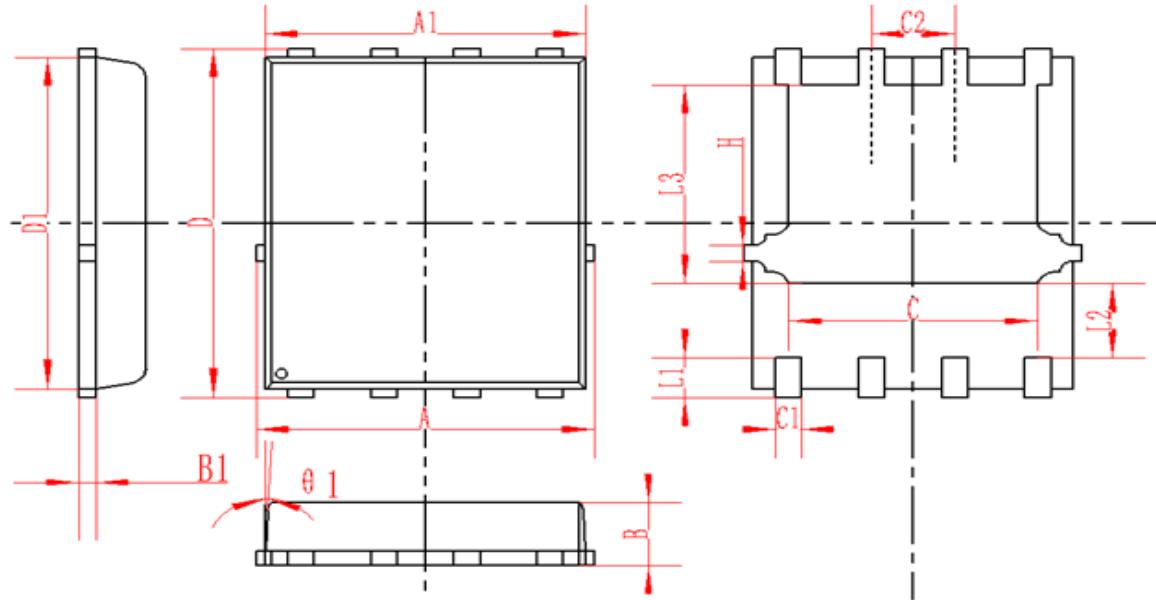


Figure 13: Normalized Maximum Transient Thermal Impedance



DFN5X6-8L Package Information



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.95	5	5.05	0.195	0.197	0.199
A1	4.82	4.9	4.98	0.190	0.193	0.196
D	5.98	6	6.02	0.235	0.236	0.237
D1	5.67	5.75	5.83	0.223	0.226	0.230
B	0.9	0.95	1	0.035	0.037	0.039
B1	0.254REF			0.010REF		
C	3.95	4	4.05	0.156	0.157	0.159
C1	0.35	0.4	0.45	0.014	0.016	0.018
C2	1.27TYP			0.5TYP		
θ1	8°	10°	12°	8°	10°	12°
L1	0.63	0.64	0.65	0.025	0.025	0.026
L2	1.2	1.3	1.4	0.047	0.051	0.055
L3	3.415	3.42	3.425	0.134	0.135	0.135
H	0.24	0.25	0.26	0.009	0.010	0.010



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