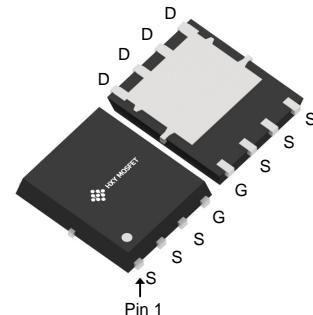




## General Description

The MCAC7D5N10YL 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.



## General Features

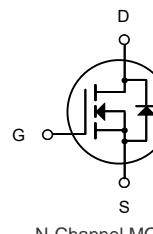
$V_{DS} = 100V$   $I_D = 75A$

$R_{DS(ON)} < 7.5m\Omega$  @  $V_{GS}=10V$

DFN5X6-8L  
(Power(5x6))

## Applications

Consumer electronic power supply Motor control



Synchronous-rectification Isolated DC

Synchronous-rectification applications

## Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
MCAC7D5N10YL	DFN5X6-8L(Power(5x6))	HXY MOSFET	5000

## Absolute Maximum Ratings at $T_j=25^\circ C$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	$V_{DS}$	100	V
Gate source voltage	$V_{GS}$	$\pm 20$	V
Continuous drain current <sup>1)</sup>	$I_D$	75	A
Pulsed drain current <sup>2)</sup>	$I_D$ , pulse	300	A
Power dissipation <sup>3)</sup>	$P_D$	97	W
Single pulsed avalanche energy <sup>5)</sup>	$E_{AS}$	90	mJ
Operation and storage temperature	$T_{STG}, T_j$	-55 to 150	$^\circ C$
Thermal resistance, junction-case	$R_{\theta JC}$	1.3	$^\circ C/W$



**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)**

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristics</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.6	2.5	V
R <sub>DS(on)</sub> note3	Static Drain-Source on-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	-	6.4	7.5	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	-	9.2	11.4	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1.0MHz	-	2944	-	pF
C <sub>oss</sub>	Output Capacitance		-	736	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	2.04	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, I <sub>D</sub> =30A, V <sub>GS</sub> =10V	-	39.4	-	nc
Q <sub>gs</sub>	Gate-Source Charge		-	5.6	-	nc
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	7.6	-	nc
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =50V, I <sub>D</sub> =25A, R <sub>G</sub> =6Ω, V <sub>GS</sub> =10V	-	13	-	nc
t <sub>r</sub>	Turn-on Rise Time		-	27.5	-	nc
t <sub>d(off)</sub>	Turn-off Delay Time		-	45.5	-	nc
t <sub>f</sub>	Turn-off Fall Time		-	41.5	-	nc
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current	-	-	75	-	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current	-	-	300	-	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	-	-	1	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>F</sub> =12A, dI/dt=100A/μs	-	177	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	1291	-	nc

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=19A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



## Typical Performance Characteristics

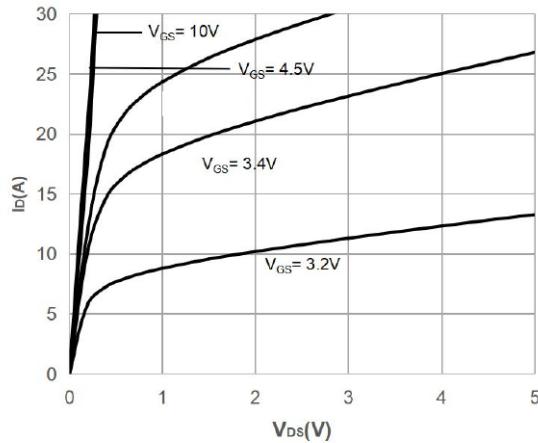


Figure 1: Output Characteristics

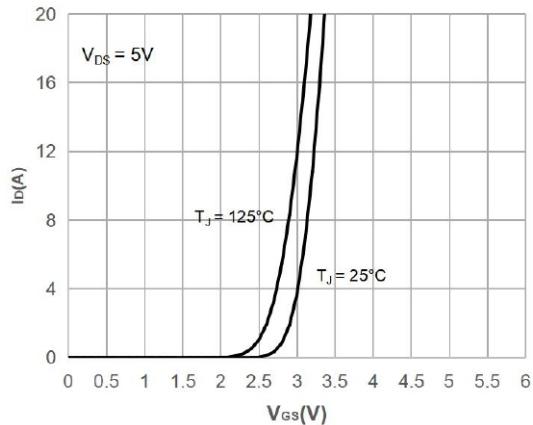


Figure 2: Typical Transfer Characteristics

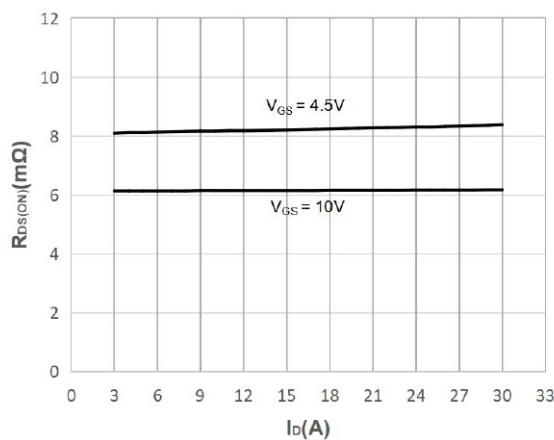


Figure 3: On-resistance vs. Drain Current

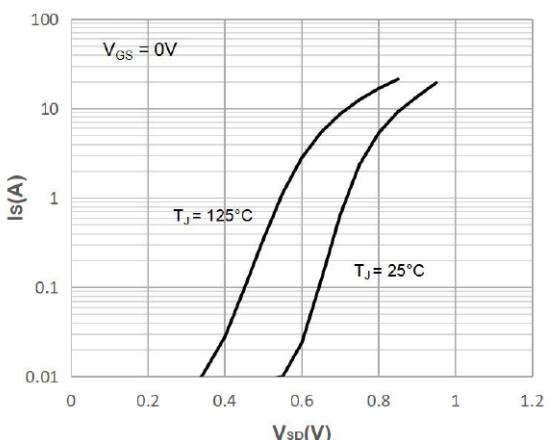


Figure 4: Body Diode Characteristics

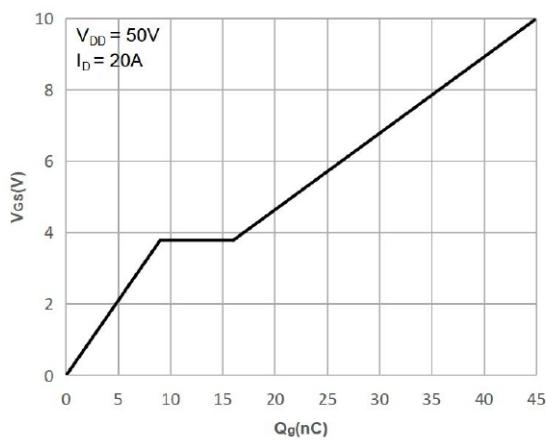


Figure 5: Gate Charge Characteristics

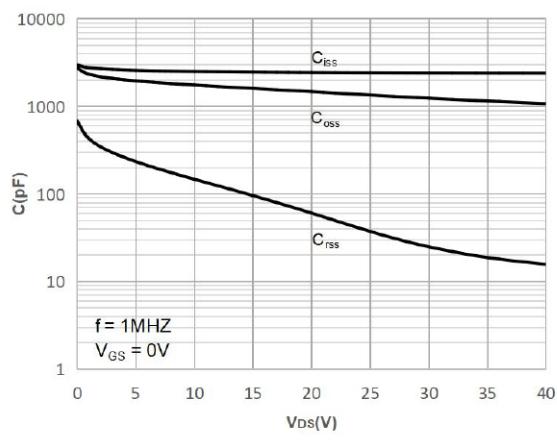
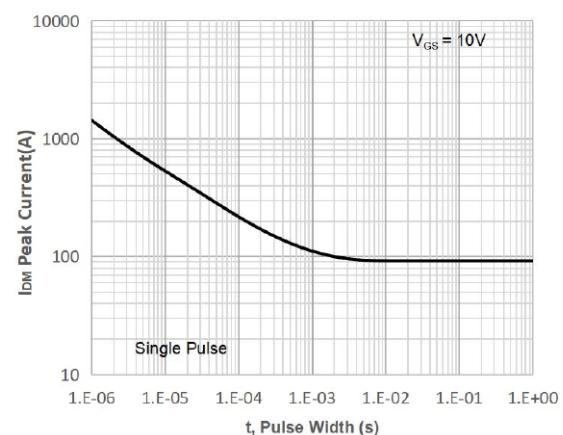
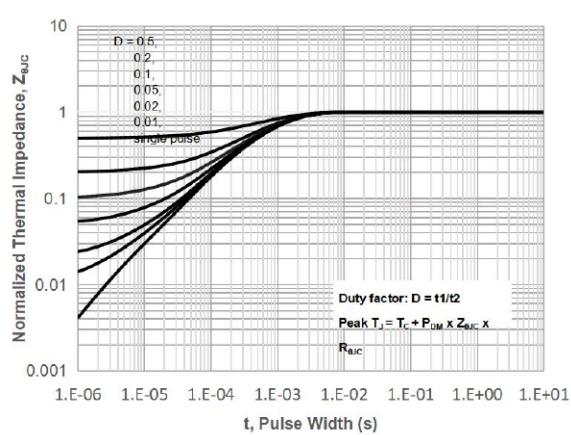
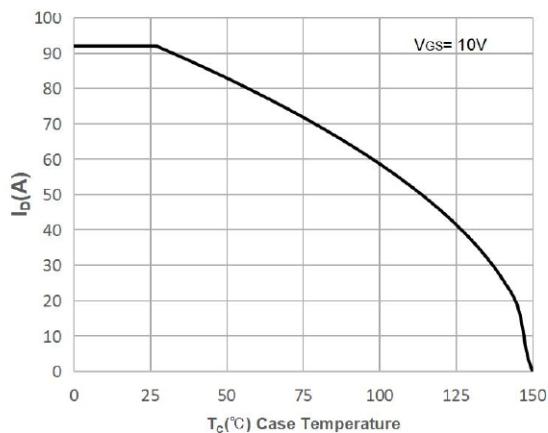
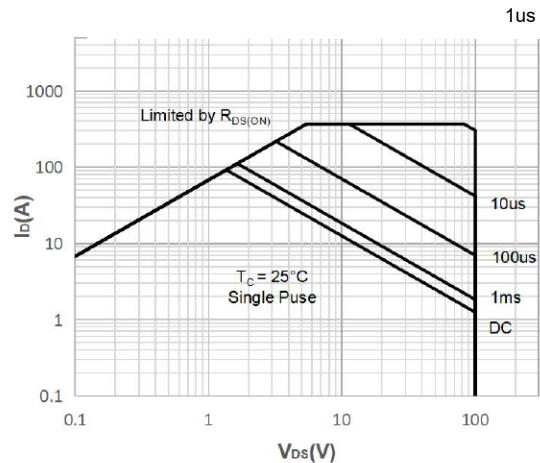
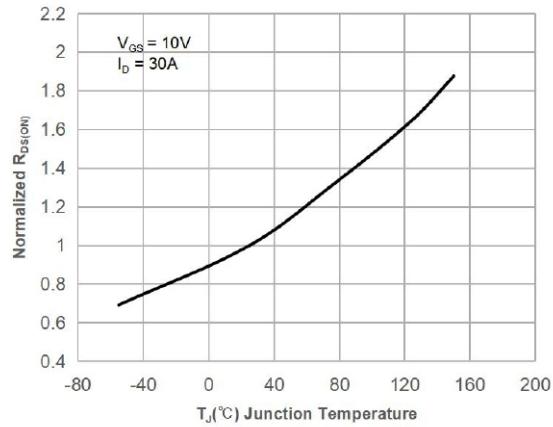
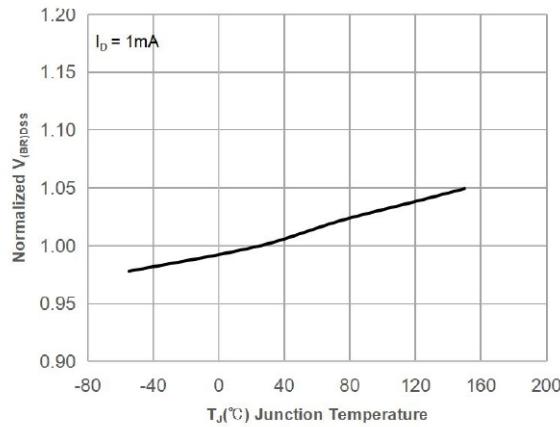
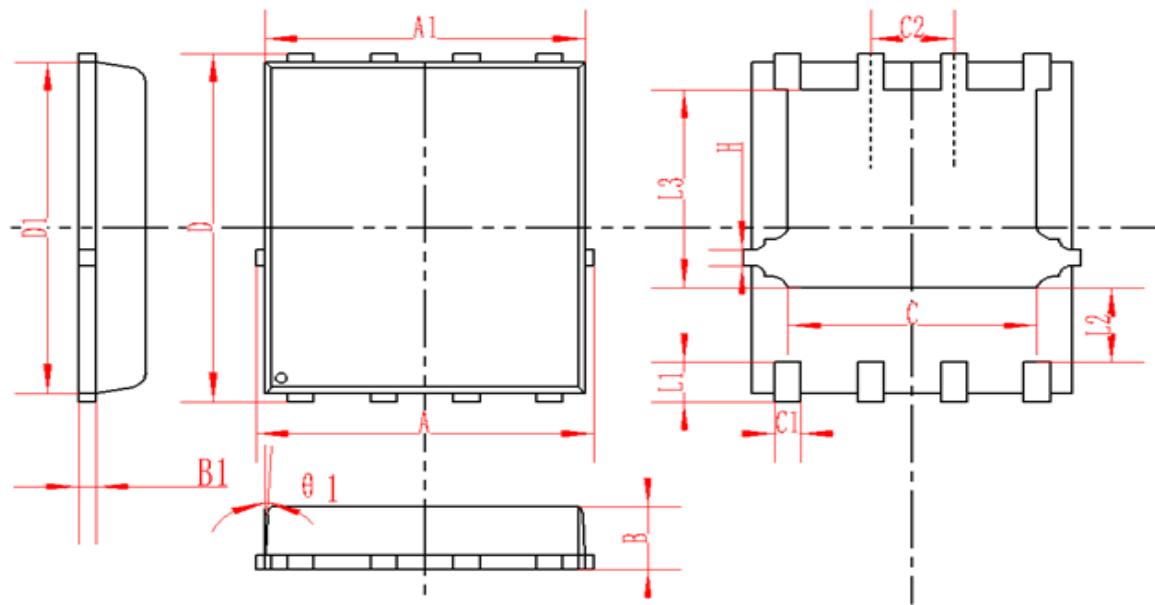


Figure 6: Capacitance Characteristics





### DFN5X6-8L(Power(5x6)) 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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