

Description

The series of devices uses **Super Trench II** technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g . This device is ideal for high-frequency switching and synchronous rectification.

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

General Features

- $V_{DS} = 100V, I_D = 80A$
 $R_{DS(ON)} = 6.1m\Omega$, typical@ $V_{GS} = 10V$
 $R_{DS(ON)} = 8.35m\Omega$, typical@ $V_{GS} = 4.5V$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 150°C operating temperature
- Pb-free lead plating

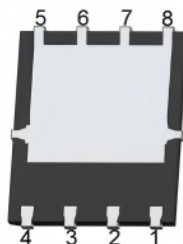
100% UIS TESTED!

100% ΔV_{ds} TESTED!

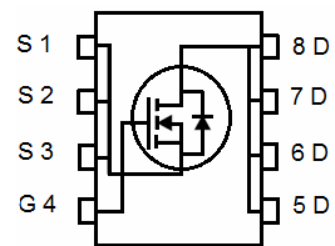
DFN5X6



Top View



Bottom View



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
RSTP070N10AGU	RSTP070N10AGU	DFN5X6-8L	-	-	-

Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	80	A
Drain Current-Continuous($T_C = 100^\circ C$)	$I_D (100^\circ C)$	58	A
Pulsed Drain Current	I_{DM}	320	A
Maximum Power Dissipation	P_D	105	W
Derating factor		0.84	W/ $^\circ C$
Single pulse avalanche energy ^(Note 4)	E_{AS}	420	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.2	$^\circ C/W$
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Electrical Characteristics (T_C=25 °C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	100		-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.7	2.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =40A	-	6.1	7.0	mΩ
		V _{GS} =4.5V, I _D =40A	-	8.35	9.4	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =40A		60	-	S
Dynamic Characteristics ^(Note3)						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, F=1.0MHz	-	3650	-	pF
Output Capacitance	C _{oss}		-	315	-	pF
Reverse Transfer Capacitance	C _{rss}		-	22	-	pF
Switching Characteristics ^(Note 3)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =50V, I _D =40A V _{GS} =10V, R _G =1.6Ω	-	16	-	nS
Turn-on Rise Time	t _r		-	11	-	nS
Turn-Off Delay Time	t _{d(off)}		-	35	-	nS
Turn-Off Fall Time	t _f		-	9	-	nS
Total Gate Charge	Q _g	V _{DS} =50V, I _D =40A, V _{GS} =10V	-	70	-	nC
Gate-Source Charge	Q _{gs}		-	14.5	-	nC
Gate-Drain Charge	Q _{gd}		-	16.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note 2)	V _{SD}	V _{GS} =0V, I _S =40A	-	-	1.2	V
Diode Forward Current	I _S		-	-	80	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 40A di/dt = 100A/μs ^(Note3)	-	60	-	nS
Reverse Recovery Charge	Q _{rr}		-	106	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production
4. EAS condition : T_J=25 °C, V_{DD}=50V, V_G=10V, L=0.25mH, R_G=25Ω

Pb Free Product

Typical Electrical and Thermal Characteristics

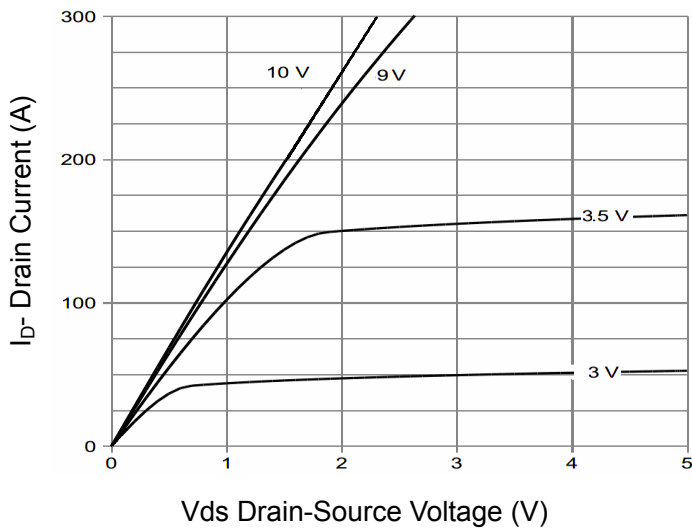


Figure 1 Output Characteristics

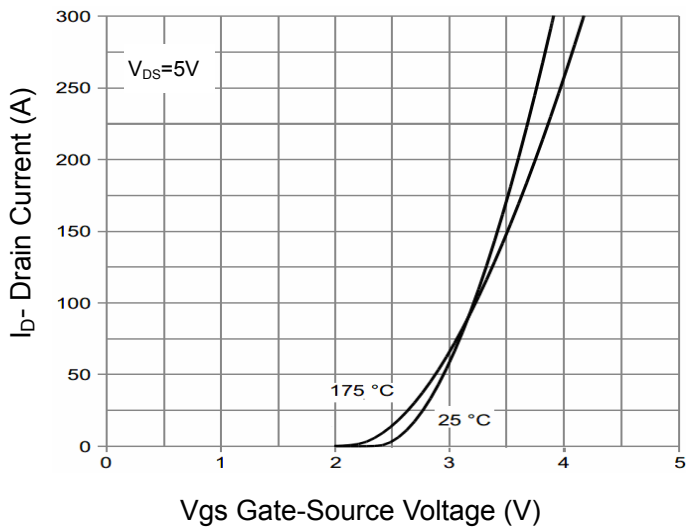


Figure 2 Transfer Characteristics

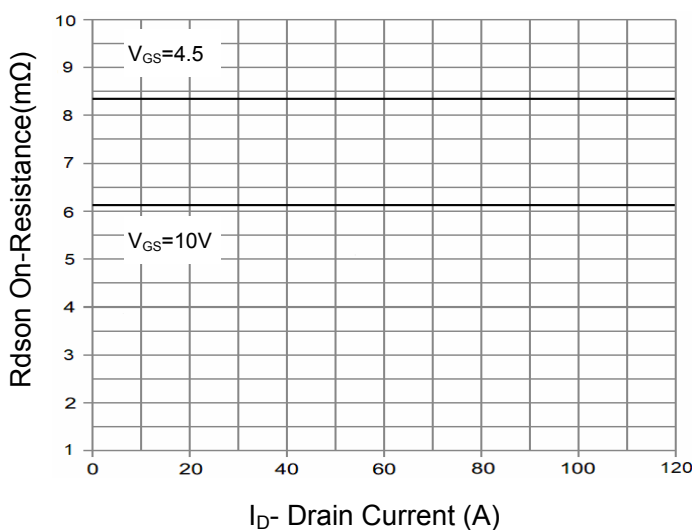


Figure 3 $R_{DS(on)}$ - Drain Current

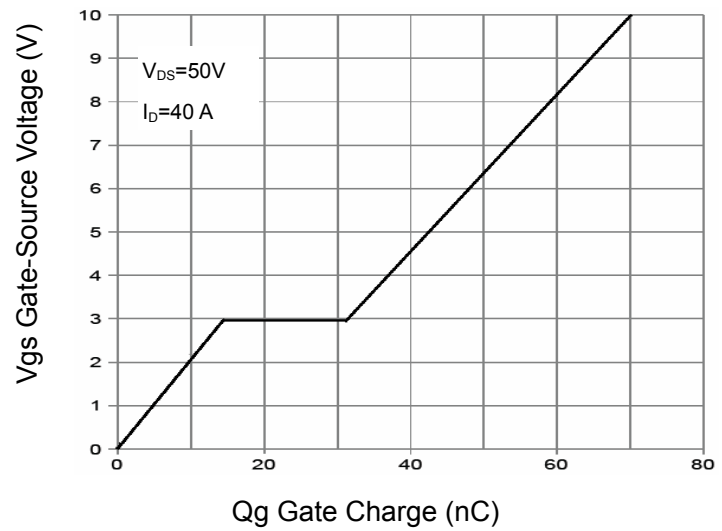


Figure 4 Gate Charge

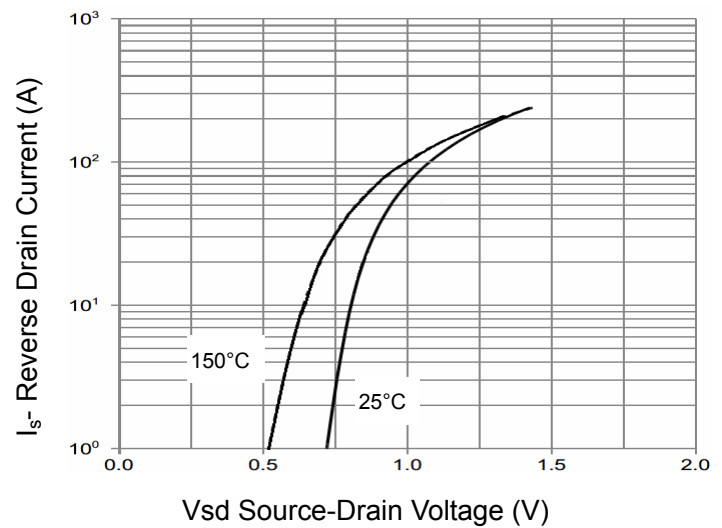


Figure 5 Source- Drain Diode Forward

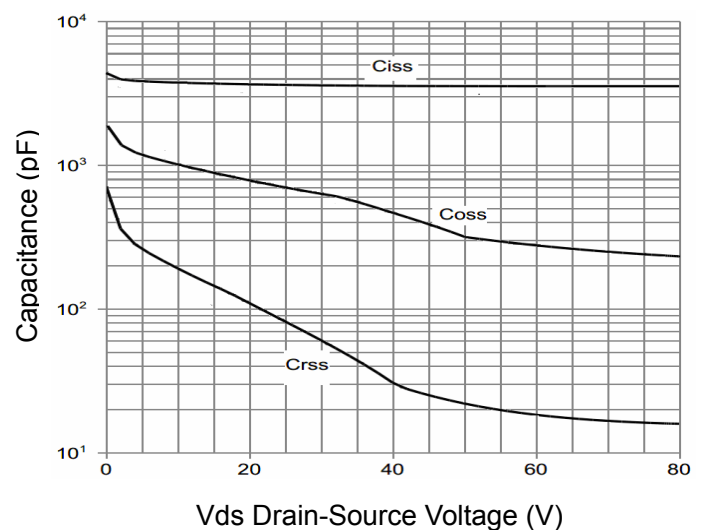


Figure 6 Capacitance vs V_{DS}

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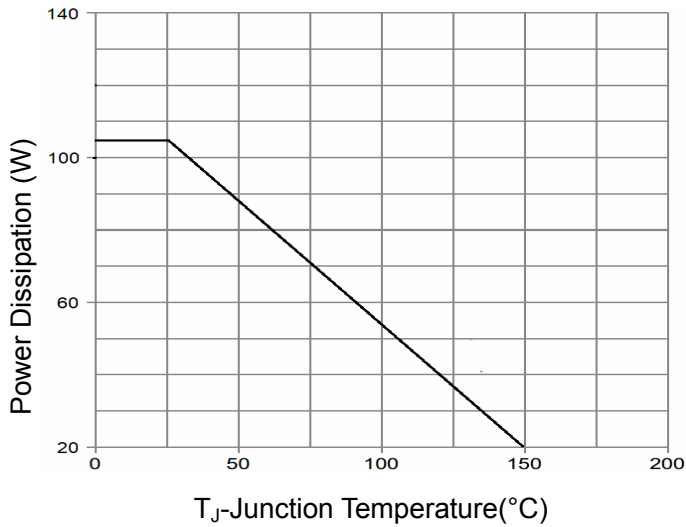


Figure 7 Power De-rating

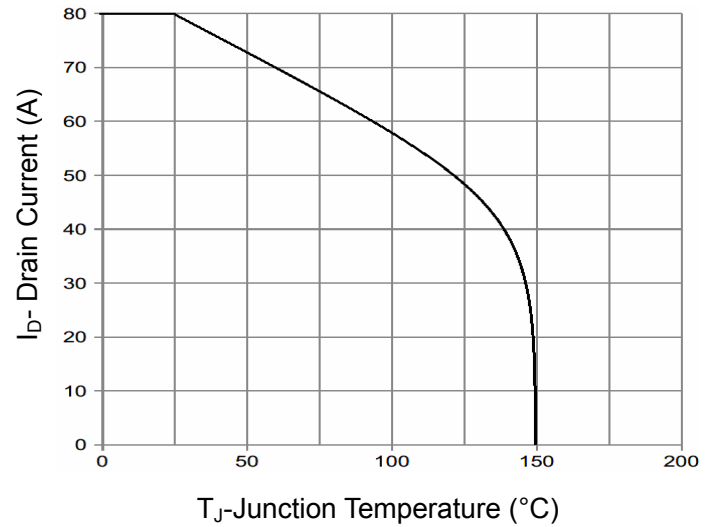


Figure 9 Current De-rating

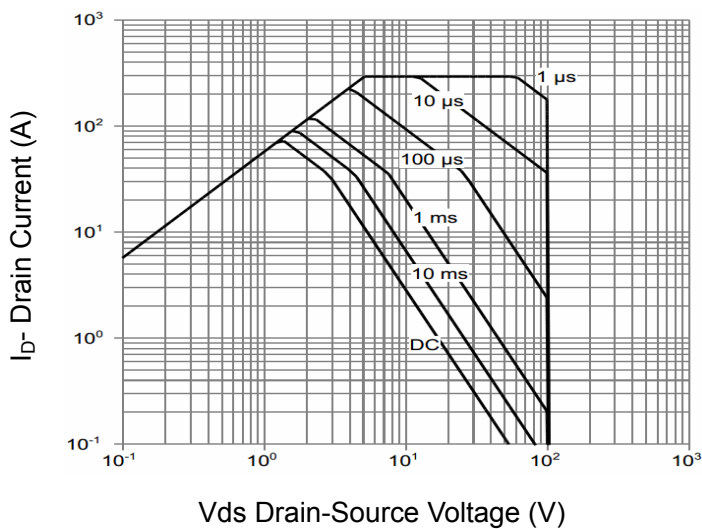


Figure 8 Safe Operation Area

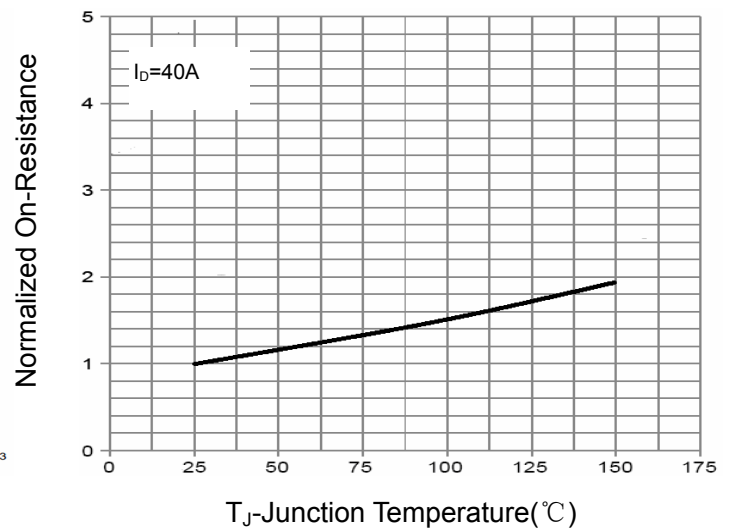


Figure 10 $R_{DS(on)}$ -Junction Temperature

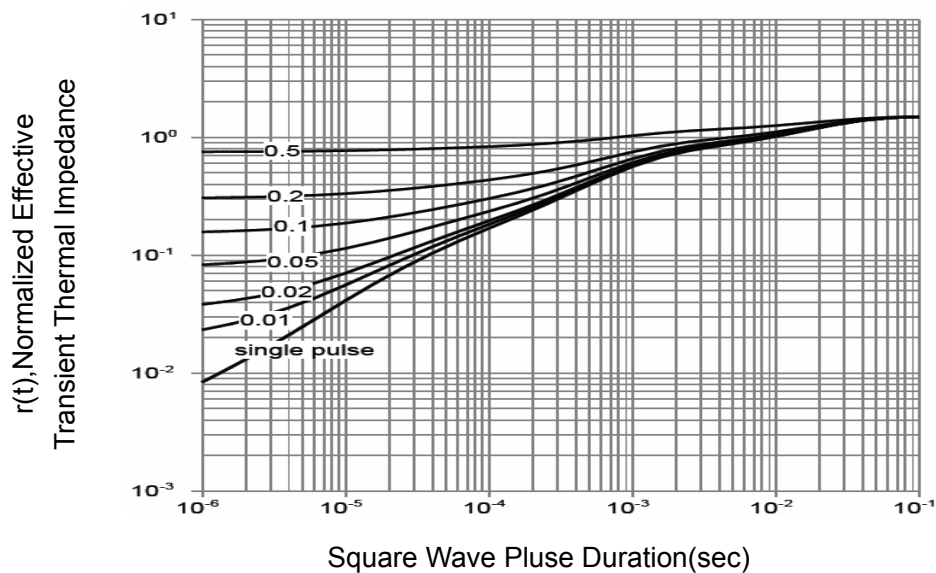
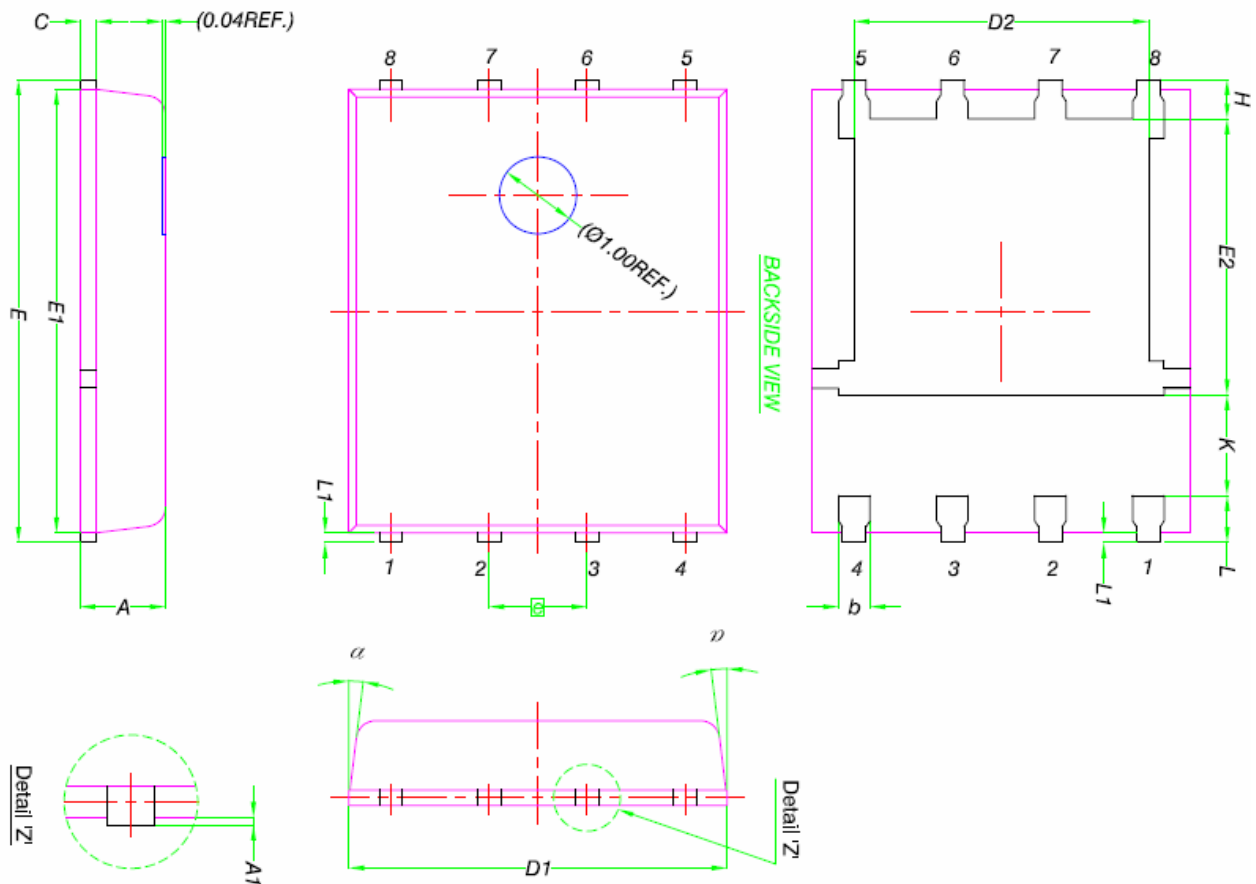


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information
Pb Free Product


DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
α	0°	-	12°

**Land Pattern
(Only for Reference)**
