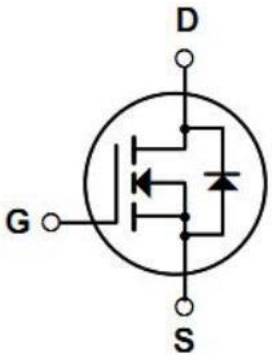
Description

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features

1) V_{DS}=20V,I_D=6A,$R_{DS(ON)}$<28mΩ @V_{GS}=4.5V. $R_{DS(ON)}$<35mΩ @V_{GS}=2.5V.
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.



Absolute Maximum Ratings T_C=25℃,unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±10	V
I_D	Continuous Drain Current-	6	A
	Continuous Drain Current-T_C=100℃	-	
	Pulsed Drain Current[1]	-	
E_{AS}	Single Pulse Avalanche Energy	--	mJ
P_D	Power Dissipation	1.25	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Ratings	Units
$R_{\Theta JC}$	Thermal Resistance,Junction to Case	-	℃/W
$R_{\Theta JA}$	Thermal Resistance,Junction to Ambient	100	

Package Marking and Ordering Information

Part NO.	Marking	Package
RYN20A6S	20A6S	SOT-23

Electrical Characteristics T_C=25℃ unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	20	22		V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=20V	-	-	-	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±10V, V_{DS}=0A	-	-	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	0.5	0.7	1.0	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=4.5V,I_D=5A	-	20	28	mΩ
		V_{GS}=2.5V,I_D=4A	-	27	35	
G_{FS}	Forward Transconductance	V_{DS}=5V, I_D=6A	--	25	-	S
Dynamic Characteristics[4]						
C_{iss}	Input Capacitance	V_{DS}=10V, V_{GS}=0V,f=1MHz	-	515	---	pF
C_{oss}	Output Capacitance		-	90	-	
C_{rss}	Reverse Transfer Capacitance		-	72	--	
R_g	Gate Resistance	f=1MHz	-	-	-	Ω
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{gs}=10V,I I_D=-A V_{ds}=10V,R_{GEN}=6Ω	-	2	---	ns
t_r	Rise Time		-	7.5	--	ns
$t_{d(off)}$	Turn-Off Delay Time		-	20	--	ns
t_f	Fall Time		-	6	--	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=10V, I_D=6A	-	12	10	nC
Q_{gs}	Gate-Source Charge		-	1	-	nC
Q_{gd}	Gate-Drain “Miller” Charge		-	2	-	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[3]	V_{GS}=0V,I_S=1A	-	--	1.2	V
t_{rr}	Reverse Recovery Time	I_F=15A,di/dt=10A/μS	-	-	-	ns
Q_{rr}	Reverse Recovery Charge		-	-	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

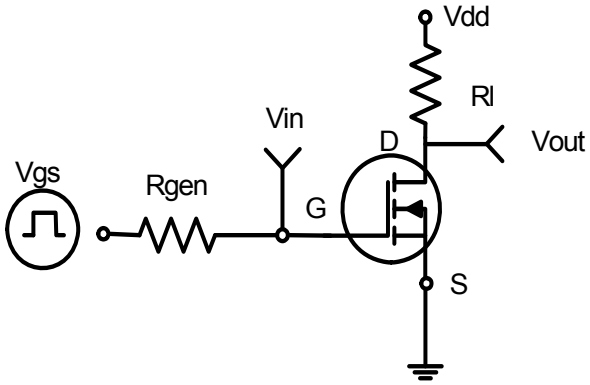


Figure 1:Switching Test Circuit

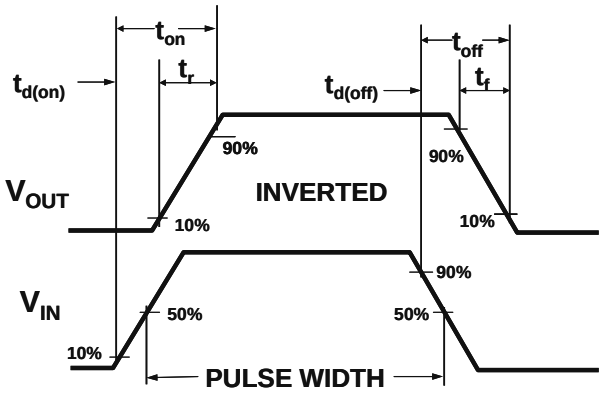


Figure 2:Switching Waveforms

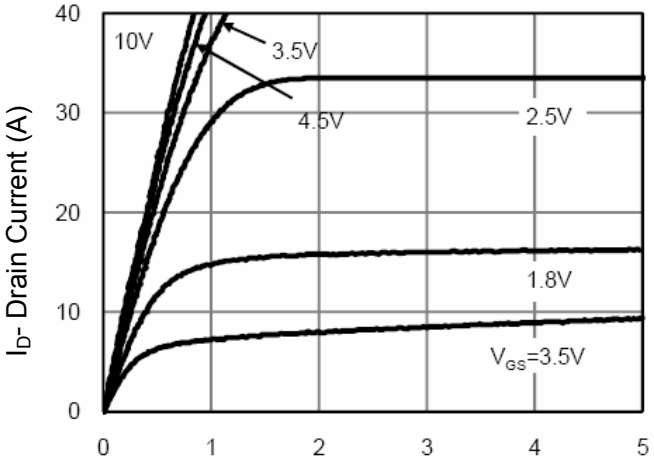


Figure 3 Output Characteristics

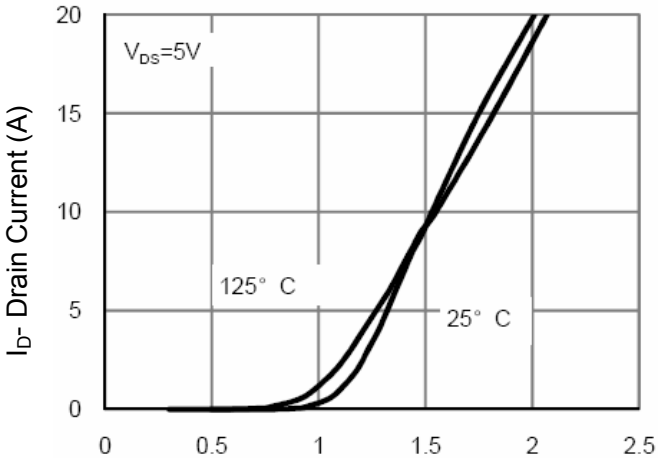


Figure 4 Transfer Characteristics

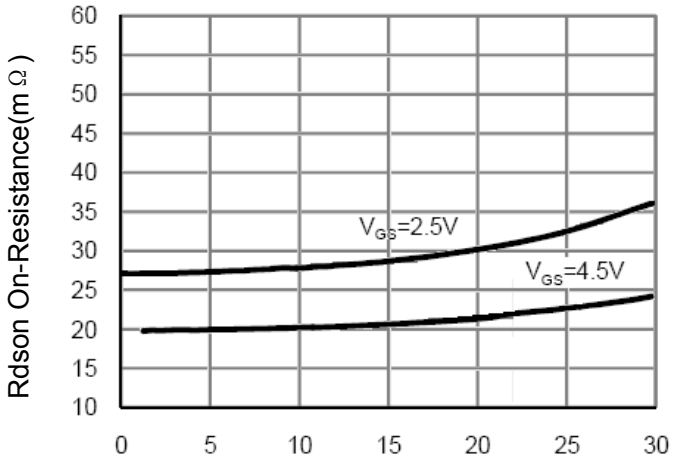


Figure 5 Drain-Source On-Resistance

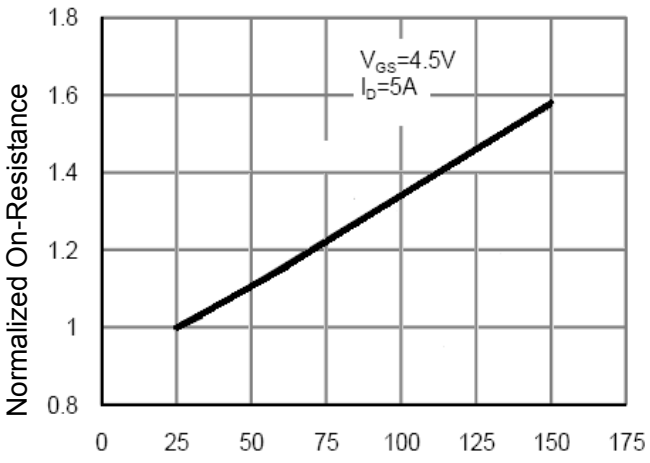


Figure 6 Drain-Source On-Resistance

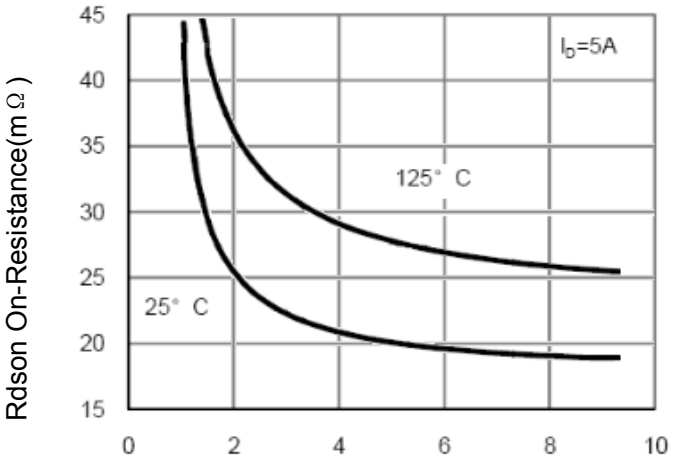


Figure7 Rdson vs Vgs

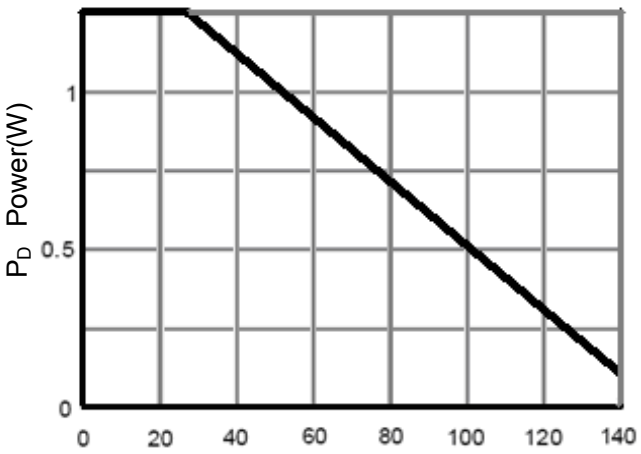


Figure 8 Power Dissipation

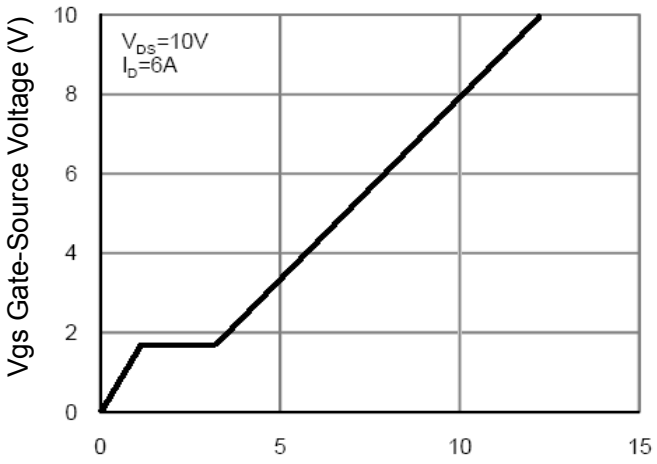


Figure 9 Gate Charge

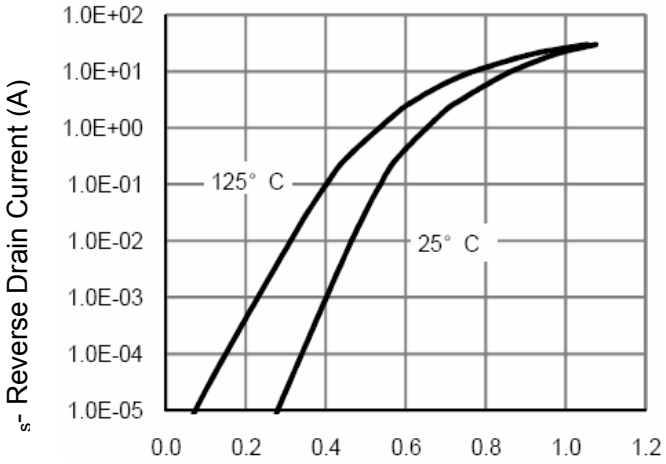


Figure 10 Source- Drain Diode Forward

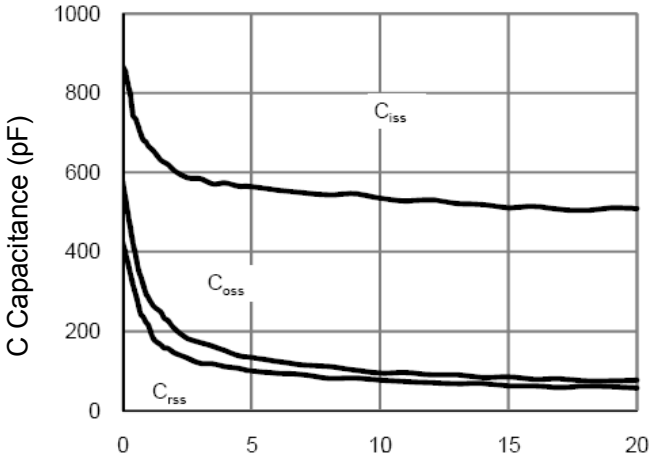


Figure 11 Capacitance vs Vds

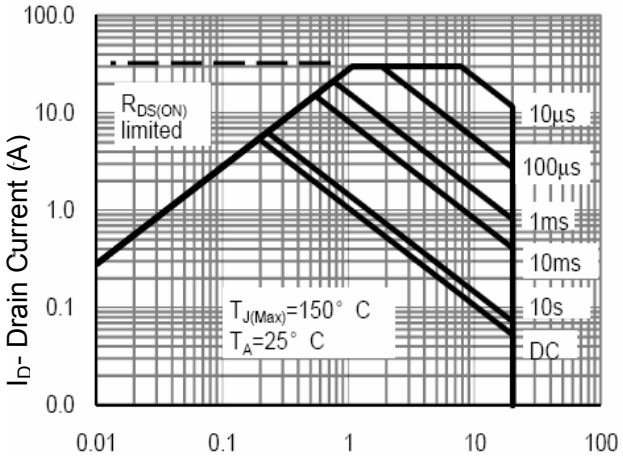


Figure 12 Safe Operation Area

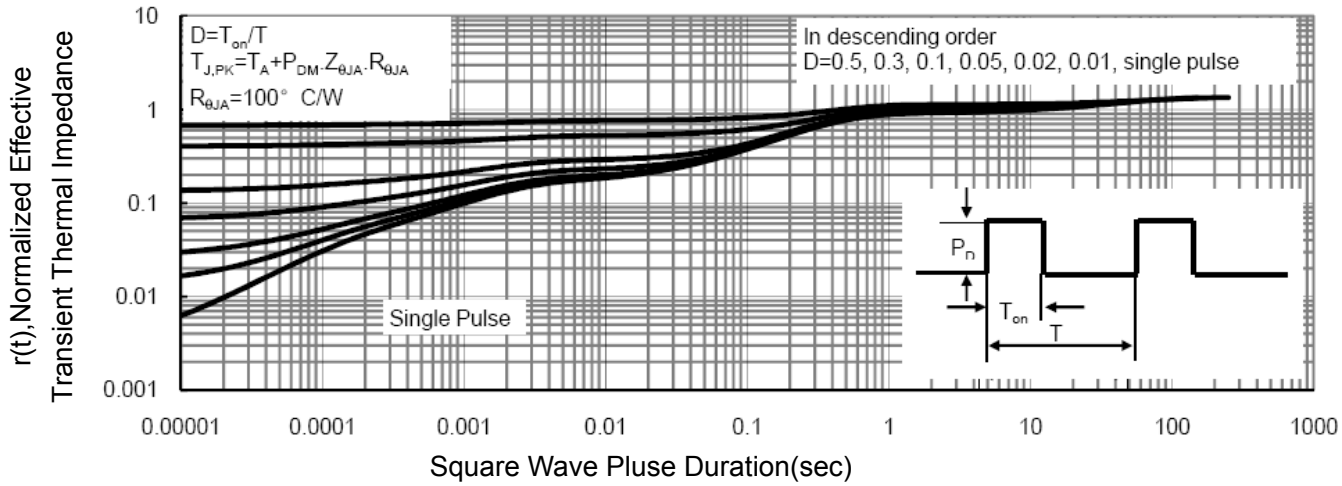


Figure 13 Normalized Maximum Transient Thermal Impedance