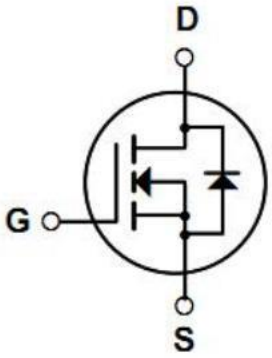
Description

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}=60V,I_D=3A,.$R_{DS(ON)}$<105mΩ @V_{GS}=10V.$R_{DS(ON)}$<125m@V_{GS}=4.5V.
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	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current-	3	A
	Continuous Drain Current-T_C=100℃	-	
	Pulsed Drain Current[1]	-	
E_{AS}	Single Pulse Avalanche Energy	--	mJ
P_D	Power Dissipation	1.7	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	73.5	

Package Marking and Ordering Information

Part NO.	Marking	Package
RYN60A3S	60A3S	SOT-23-3L

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	60	65		V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=60V	-	-	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	-	-	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1.0	1.3	2.0	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=3A	-	78	105	mΩ
		V_{GS}=4.5V,I_D=3A	-	95	125	
G_{FS}	Forward Transconductance	V_{DS}=15V, I_D=2A	---	3	-	S
Dynamic Characteristics[4]						
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V,f=1MHz	-	247	---	pF
C_{oss}	Output Capacitance		-	34	-	
C_{rss}	Reverse Transfer Capacitance		-	19.5	--	
R_g	Gate Resistance	f=1MHz	-	-	-	Ω
Switching Characteristics[4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V,I I_D=1.5A V_{GS}=10V,R_{GEN}=1Ω	-	6	--	ns
t_r	Rise Time		-	15	---	ns
$t_{d(off)}$	Turn-Off Delay Time		-	15	---	ns
t_f	Fall Time		-	10	---	ns
Q_g	Total Gate Charge	V_{GS}=30V, V_{DS}=4.5V, I_D=3A	-	6	-	nC
Q_{gs}	Gate-Source Charge		-	1	-	nC
Q_{gd}	Gate-Drain “Miller” Charge		-	1.3	-	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[3]	V_{GS}=0V,I_S=3A	-	--	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

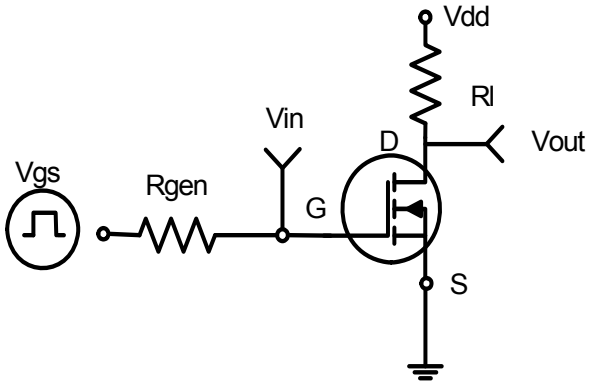


Figure 1:Switching Test Circuit

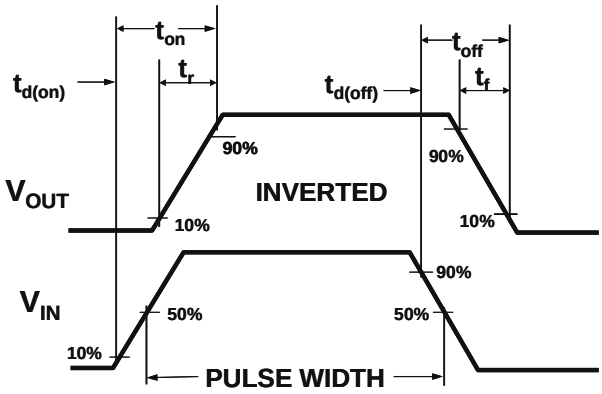


Figure 2:Switching Waveforms

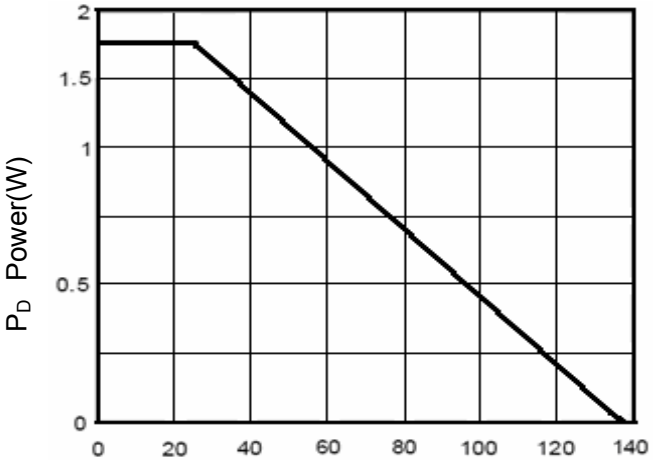


Figure 3 Power Dissipation

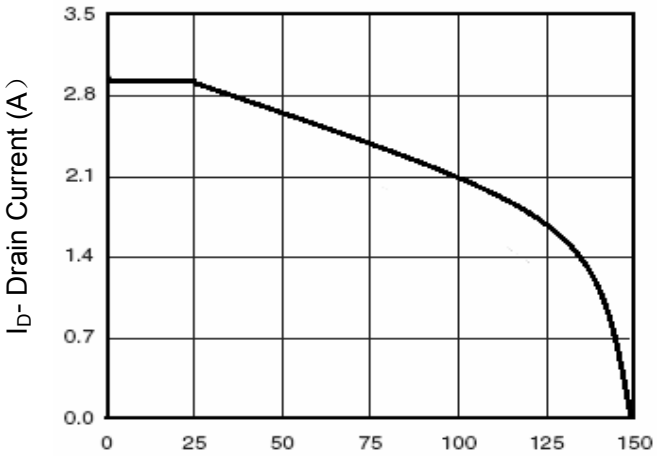


Figure 4 Drain Current

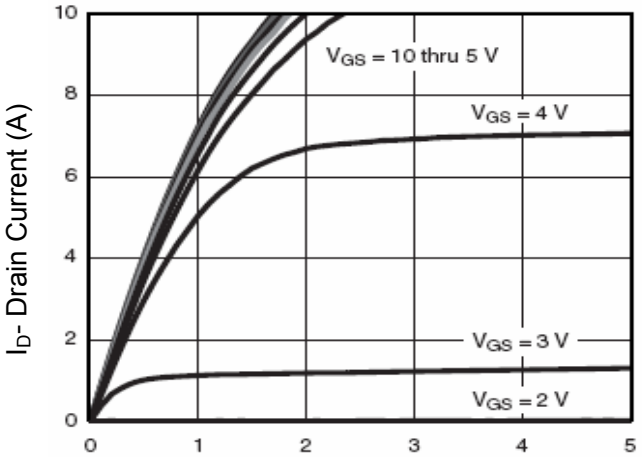


Figure 5 Output Characteristics

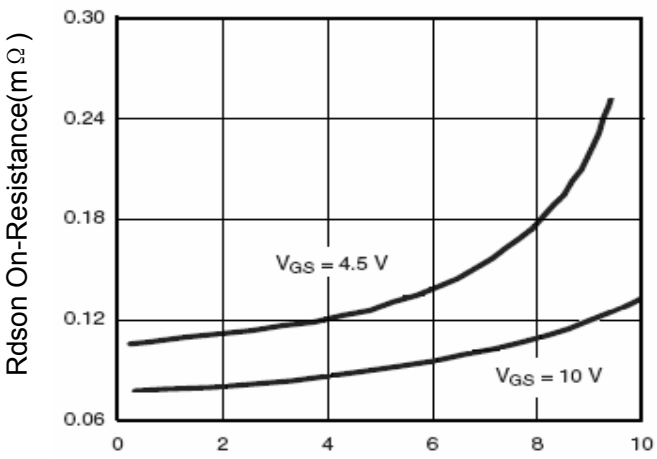


Figure 6 Drain-Source On-Resistance

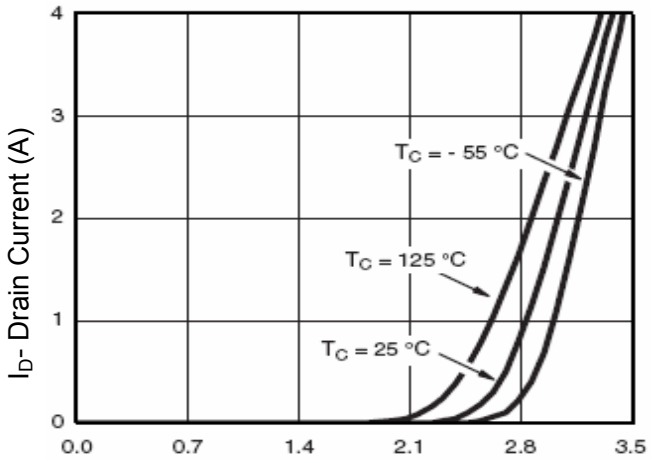


Figure 7 Transfer Characteristics

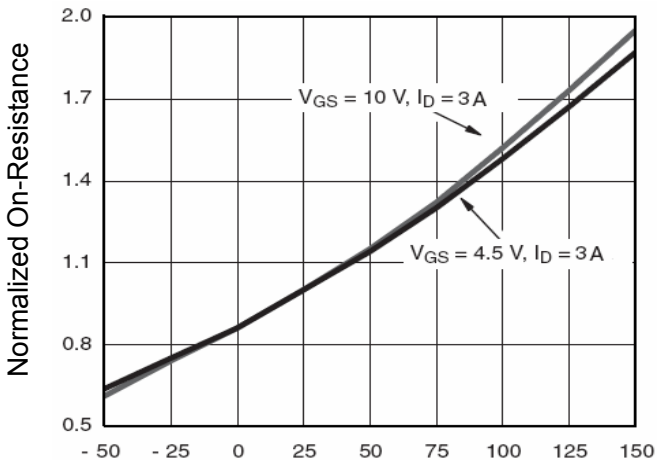


Figure 8 Drain-Source On-Resistance

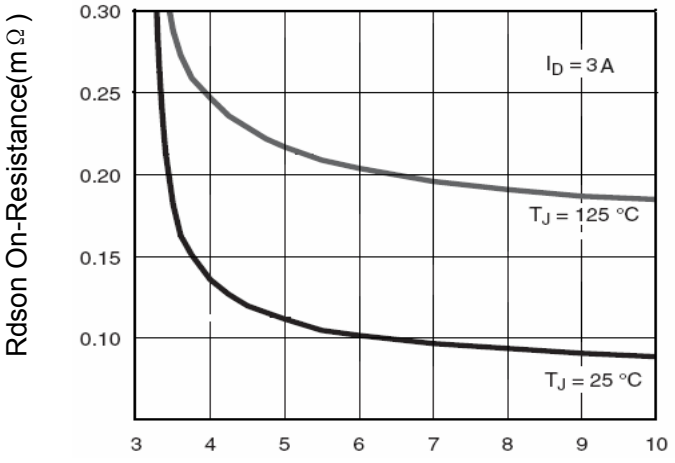


Figure 9 Rdson vs Vgs

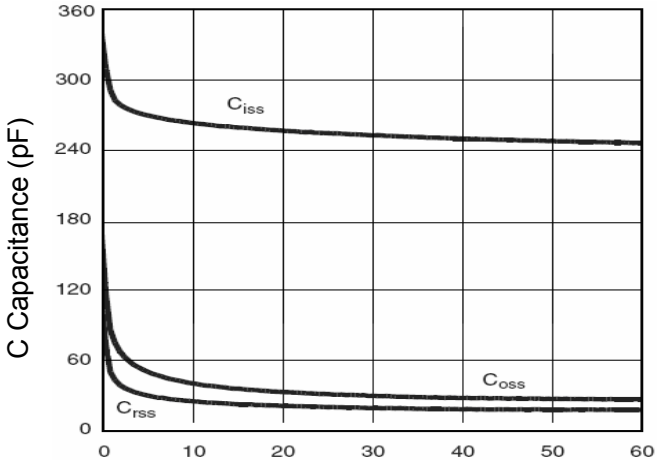


Figure 10 Capacitance vs Vds

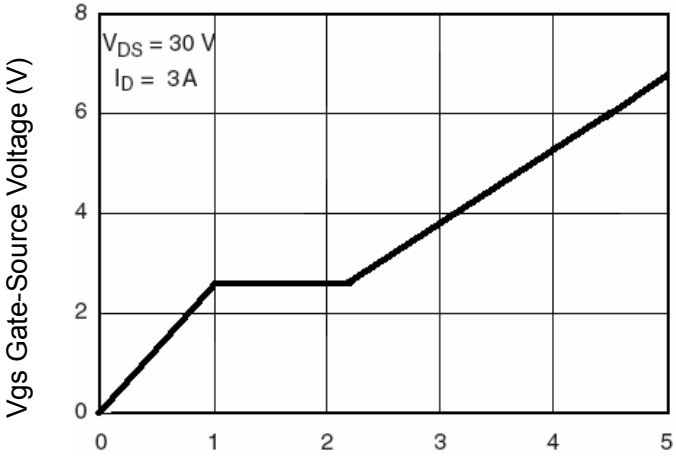


Figure 11 Gate Charge

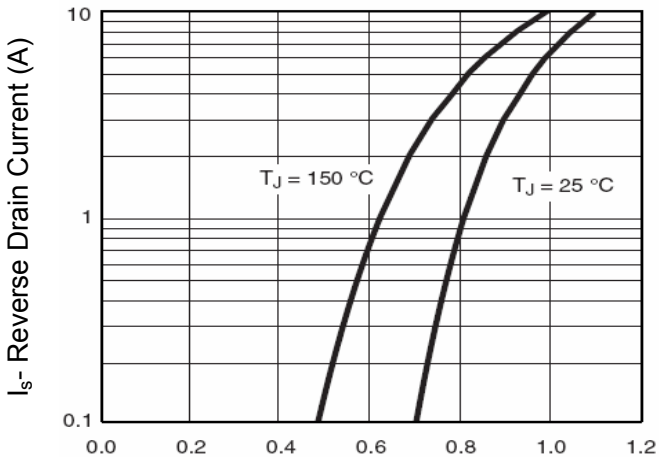


Figure 12 Source- Drain Diode Forward

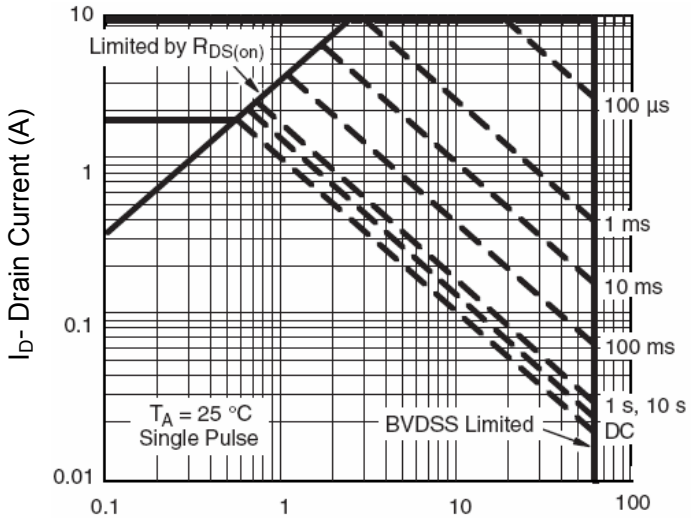


Figure 13 Safe Operation Area

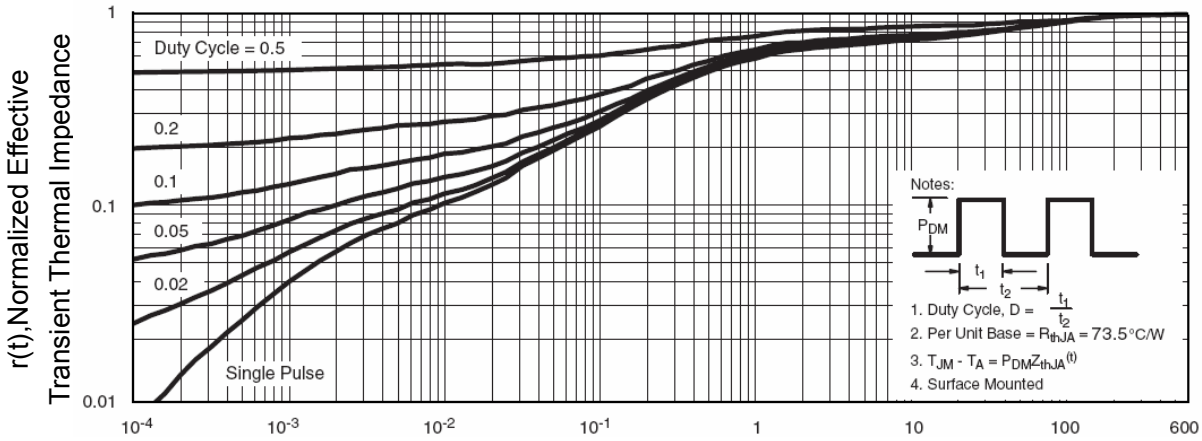


Figure 14 Normalized Maximum Transient Thermal Impedance