N CHANNEL ENHANCEMENT MODE POWER MOSFET

Lead Free Package and Finish

I_D	R_{DS}(ON) (Max)	V_{DSS}
25A	36mΩ	60V

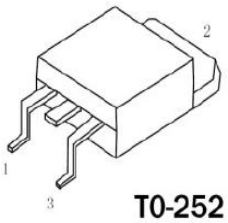
Description:

RS60N25D Series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance . it provides the designer with an extreme efficient device for use in a wide range of power applications

The TO-252 package is widely preferred for all commercial industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance

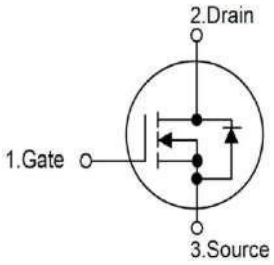
Features:

- Lower On-resistance
- Simple Drive Requirement
- Fast Switching Characteristic
- RoHS Compliant



TO-252

Not to Scale



Not to Scale

Ordering Information

Part Number	Package	Marking
RS60N25D	TO-252	RS60N25D

Absolute Maximun Ratings Tc=25℃ unless otherwise specified

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	A
I_D @Tc=25℃	Drain Current	25	
I_D @Tc=100℃	Drain Current,Vgs@10V	16	
I_{DM}	Pulsed Drain Current (Note*1)	80	
PD @Tc=25℃	Total Power Dissipation	35	W
TL	Maximum Temperature for Soldering Leads at 0.063in(1.6mm)from Case for 10 seconds	300	℃
TPKG	Package Body for 10 seconds	260	
TJ and TSTG	Operating Junction and Storage Temperature Range	-55 to 150	

Caution:Stresses greater than those listed in the “Absolute Maximum Ratings” Table may cause permanent damage to the device.

Thermal Resistance

Symbol	Parameter	Value	Units
$Rthj_{-C}$	Maximum Thermal Resistance,Junction-case	3.6	℃/W
Rthj_a	Maximum Thermal Resistance,Junction-ambient[3]	62.5	℃/W

Electrical Characteristics @TJ=25℃(unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
BVDSS	Drain-source Breakdown Voltage	60	--	--	V	V_{GS}=0V, I_D=1mA
I_{DSS}	Drain-Source Leakage Current	--	--	10	μA	V_{DS}=60V, V_{GS}=0V
I_{GSS}	Gate-Source Forward Leakage	--	--	100	nA	V_{GS}=+20V V_{DS}=0V
	Gate-Source Reverse Leakage	--	--	-100		V_{GS}=-20V V_{DS}=0V
g_{fs}	Forward Transconductance	--	12.4	--	S	ID=15A V_{DS}=10V

ON Characteristics TJ=25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
R_{DS}(on)	Static Drain-Source On-Resistance[2]	--	28	36	mΩ	V_{GS}=10V, I_D=18A
		--	42	50	mΩ	V_{GS}=4.5V, I_D=12A
V_{GS}(TH)	Gate Threshold Voltage	1	1.6	3	V	V_{GS}=V_{DS}, I_D=250μA

Resistive Switching Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
td(on)	Turn-on Delay Time	--	6.6	--	nS	V_{DS}=30V I_D=15A Rg=3.3Ω Vgs=10V
trise	Rise Time	--	22.2	--		
td(off)	Turn-OFF Delay Time	--	17	--		
tfall	Fall Time	--	4.3	--		

Dynamic Characteristics Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
C_{iss}	Input Capacitance	--	625	998	pF	V_{GS}=0V V_{DS}=25V f=1.0MHz
Coss	Output Capacitance	--	90	--		
Crss	Reverse Transfer Capacitance	--	65	--		
Qg	Total Gate Charge	--	17	27	nC	V_{DS}=48V I_D=15A VGS=10V
Qgs	Gate-Source Charge	--	2.5	--		
Qgd	Gate-Drain("Miller") Charge	--	6.4	--		

Source-Drain Diode Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V_{SD}	Diode Forward Voltage[2]	--	--	1.3	V	I_S=15A, V_{GS}=0V
t_{rr}	Reverse Recovery Time[2]	--	27	--	nS	V_{GS}=0V
Q_{rr}	Reverse Recovery Charge	--	26	--	nC	I_S=15A, di/dt=100A/μs

Notes:

*1. Pulse width limited by max. junction temperature
*2. Pulse test
*3. Surface mounted on 1 in^2 copper pad of FR4 board,

Typical Feature curve

Figure1. Typical Output Characteistics

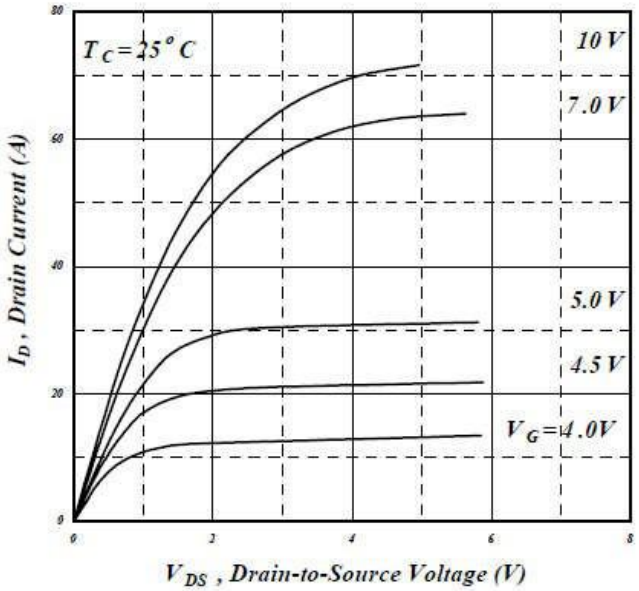
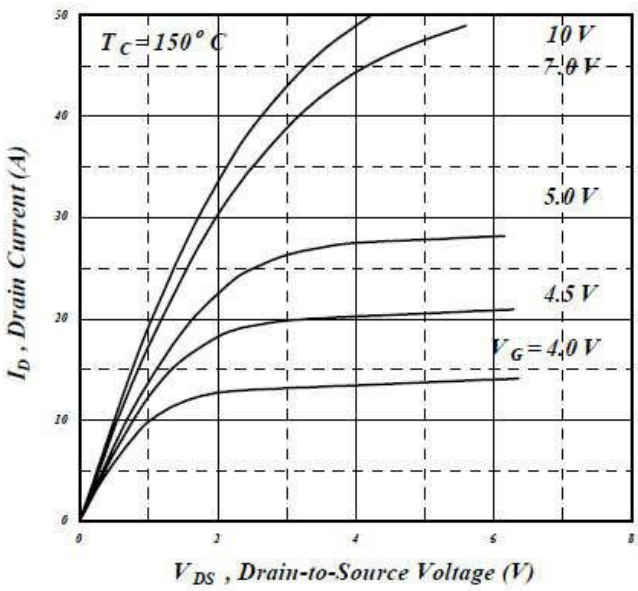
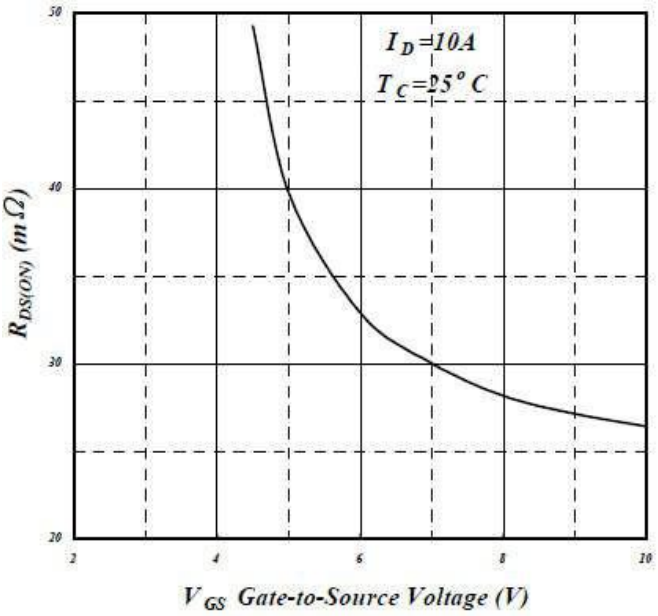


Figure2. Typical Output Characteristics



Figuer3. Typical ON Resistance V.S Gate Voltage



Figuer4. Normalized On-Resistance V.S. Junction Temperature

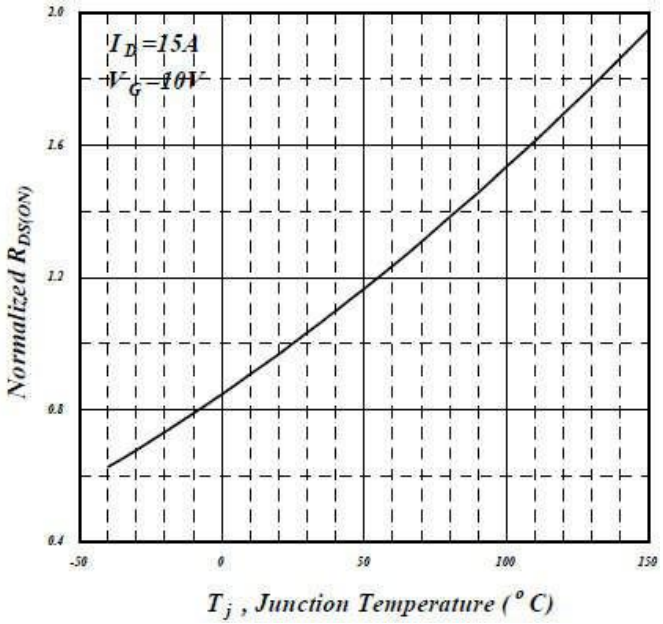


Figure5. Forward Characteristic of Reverse Diode

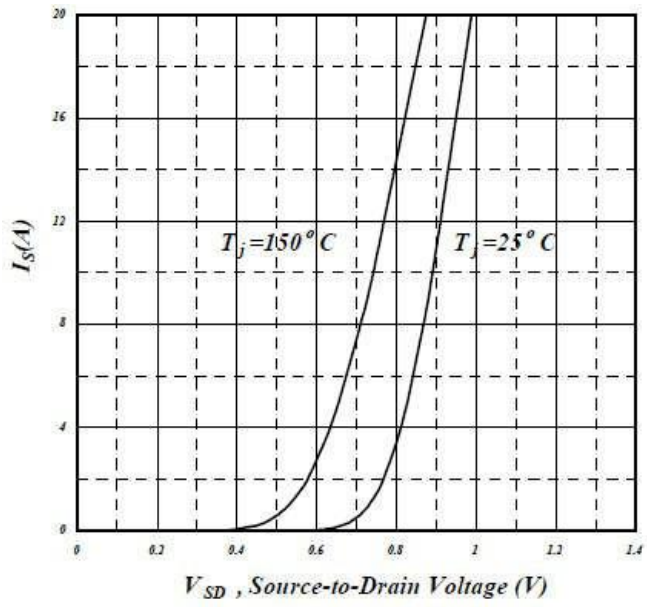


Figure6. Gate Threshold Voltage V.S Junction Temperature

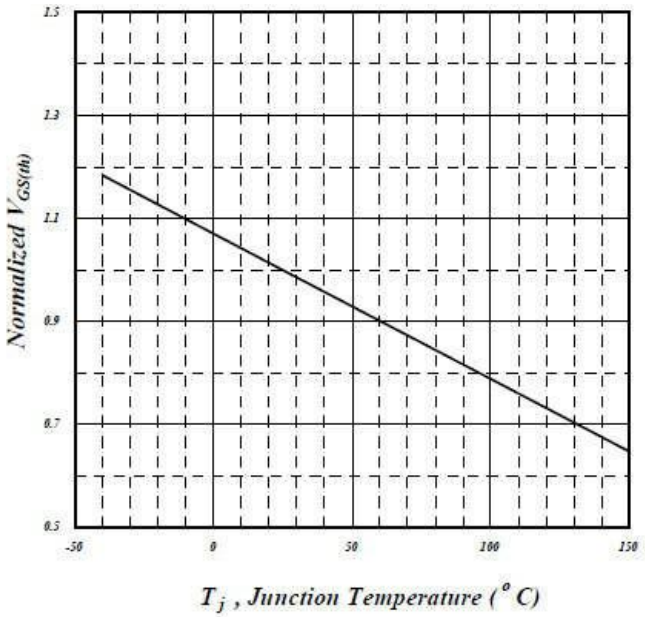


Figure7. Gate Charge Characteristics

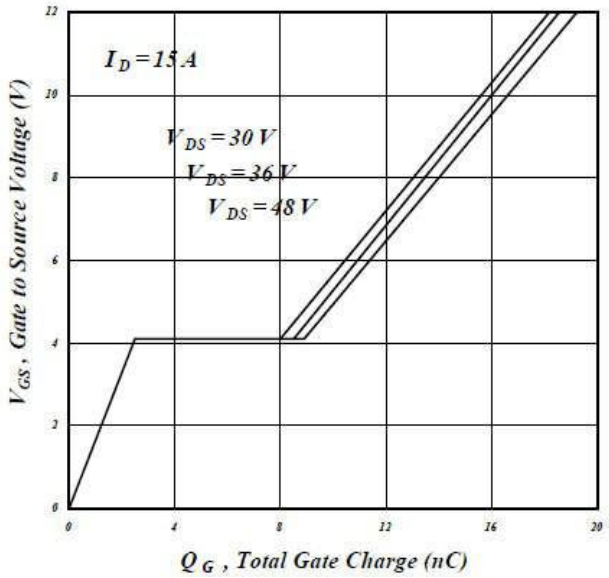


Figure8. Typical Capacitance Characteristics

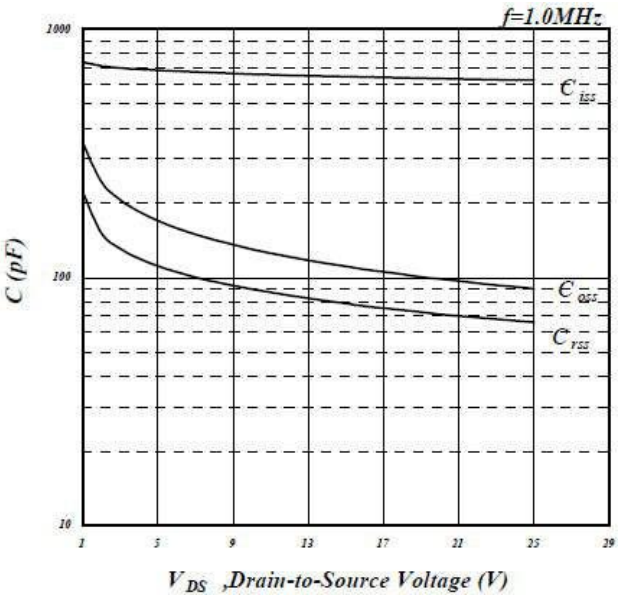


Figure9. Maximum Safe Operating Area

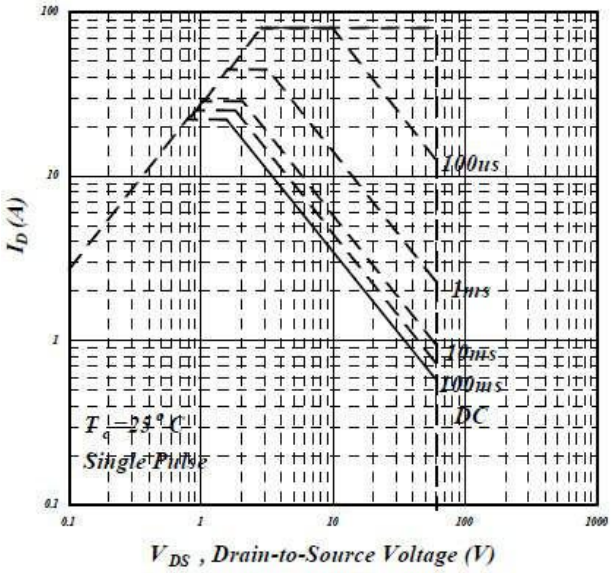


Figure10. Effective Transient Thermal Impedance

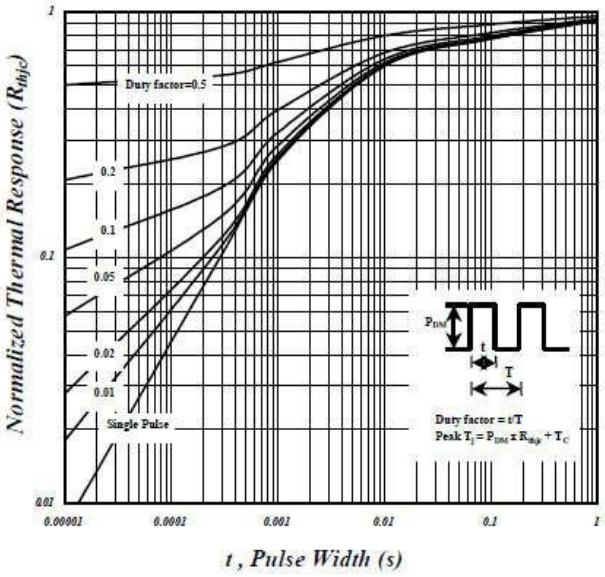


Figure11.
Switching Time Waveform

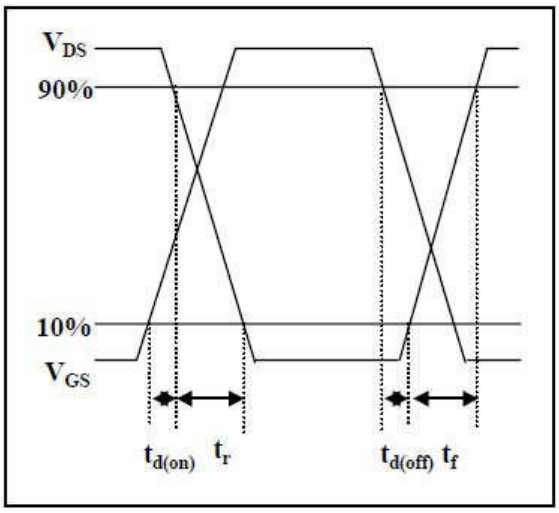
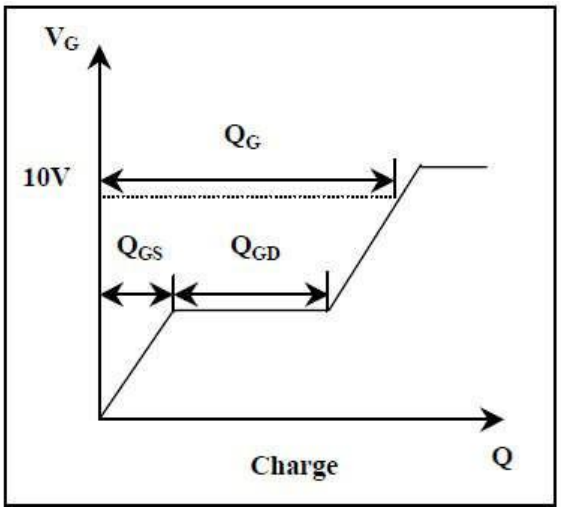
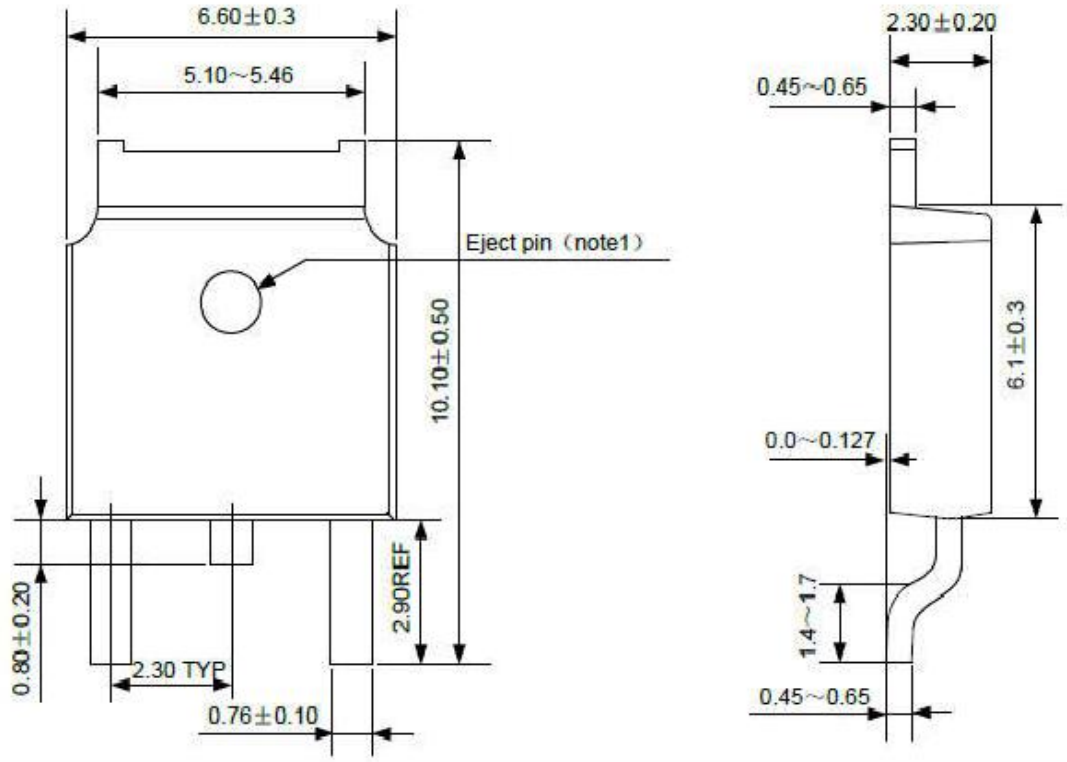


Figure12.
Gate Charge Waveform



Package Outline: TO-252

Unit:mm



Note: The location is divided into top pinhole with no top pinhole two conditions

TO-252 FOOTPRINT：