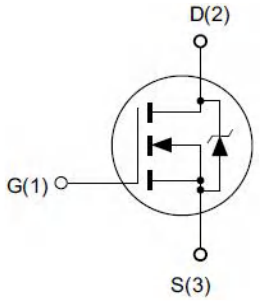
RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

RM11N650LD

N-Channel Power MOSFET

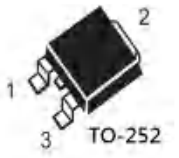
Features

- 650V, 11A, $R_{DS(ON)}$(Typ.) = 0.32Ω@V_{GS} = 10V
- Advanced Super Junction Technology
- Easy To Control Gate Switching
- Enhancement Mode: $V_{GS(th)}$ = 2.8 to 4.2 V



Application

- Resonant Switching PWM
- PFC Stages, Hard Switching PWM Stages
- PC, Silver box, Adaptor, LCD & PDP TV and Lighting
- Server Power, Telecom Power and UPS Application
- Halogen-free



Package Marking And Ordering Information

Device	Device Package	Marking
RM11N650LD	TO-252	11N650

Absolute Maximum Ratings Tc = 25°C unless otherwise noted

Symbol	Parameter	Rating	Unit
V_{DS}	Drain-Source Voltage [a]	650	V
V_{GS}	Gate-Source Voltage	±30	
I_D	Drain Current-Continuous, T_C =25°C	11	A
I_{DM}	Drain Current-Pulsed [b]	33	
P_D	Maximum Power Dissipation @ T_J =25°C	83	W
dv/dt	Peak Diode Recovery dv/dt [c]	15	V/ns
E_{AS}	Single Pulsed Avalanche Energy [d]	624	mJ
T_J, T_{STG}	Operating and Store Temperature Range	150，-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	°C/W

2024-07/112
REV:O

Electrical Characteristics T_J = 25°C unless otherwise noted

Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Forward Gate Body Leakage Current	V_{DS} = 0V, V_{GS} = ±30V	-	-	±100	nA

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.8	-	4.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance [c]	V_{GS} = 10V, I_D = 5.5A	-	0.32	0.35	Ω

Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
R_G	Gate Resistance	f = 1.0MHz	-	11	-	Ω
C_{iss}	Input Capacitance	V_{DS} = 50V, V_{GS} = 0V, f = 10kHz	-	901	-	pF
C_{oss}	Output Capacitance		-	59	-	
C_{rss}	Reverse Transfer Capacitance		-	5.3	-	

On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 400V, I_D =4.8A, V_{GS}=13V, R_G=3.4Ω	-	7.2	-	ns
t_r	Turn-On Rise Time		-	20.8	-	
$t_{d(off)}$	Turn-Off Delay Time		-	29.2	-	
t_f	Turn-Off Fall Time		-	19.2	-	
Q_g	Total Gate Charge	V_{DS} = 400V, I_D =4.8A, V_{GS} = 0 to10V	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	5.8	-	
Q_{gd}	Gate-Drain Charge		-	17	-	

Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0V, I_F = 1A	-	0.74	-	V
T_{rr}	Body Diode Reverse Recovery Time	I_F=4.8A,V_R = 400V dI_F/dt=100A/us	-	250	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=4.8A,V_R = 400V dI_F/dt=100A/us	-	2.57	-	μC
I_{rrm}	Peak reverse recovery current	I_F=4.8A,V_R = 400V dI_F/dt=100A/us	-	19.6	-	A

Notes:

a. T_J = +25 ℃ to +150 ℃

b. Repetitive rating; pulse width limited by maximum junction temperature.

c. Pulse width ≦ 300μs; duty cycle ≦ 2%

d. L = 49.9mH, V_{DD} = 50V, I_{AS} = 10A, R_G = 25Ω Starting T_J = 25 ℃ .

RATING AND CHARACTERISTICS CURVES (RM11N650LD)

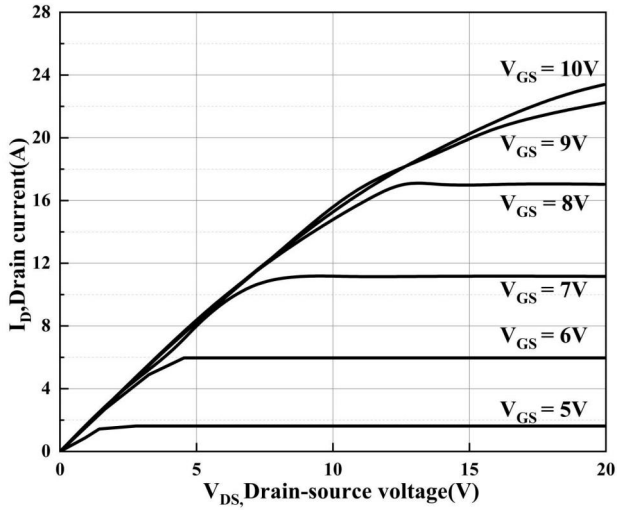


Figure 1. Typical Output Characteristics

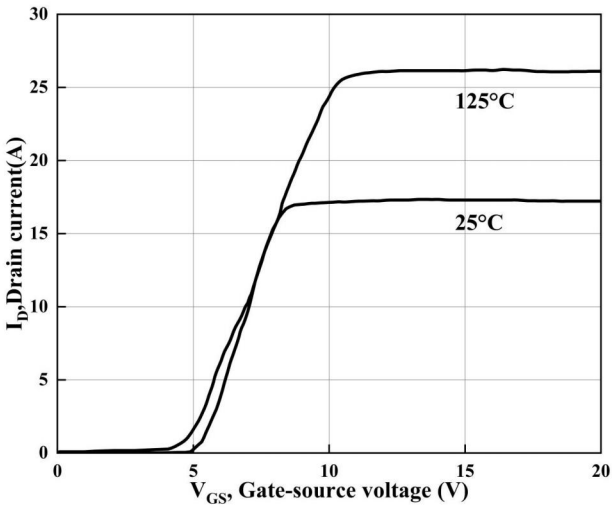


Figure 2. Typical Transfer Characteristics

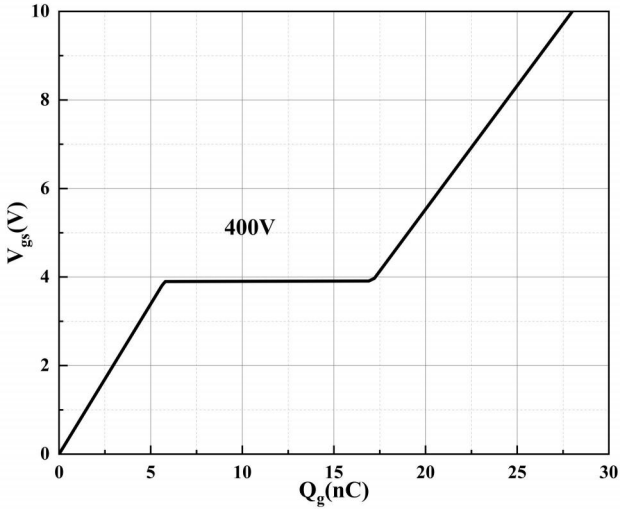


Figure 3. Typical Gate Charge

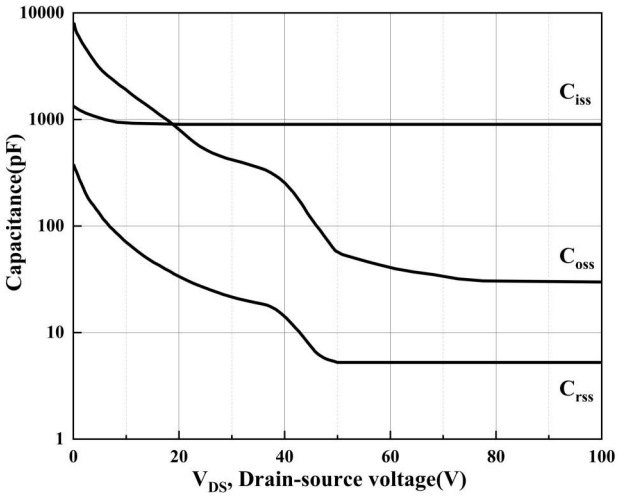


Figure 4. Typical Capacitance

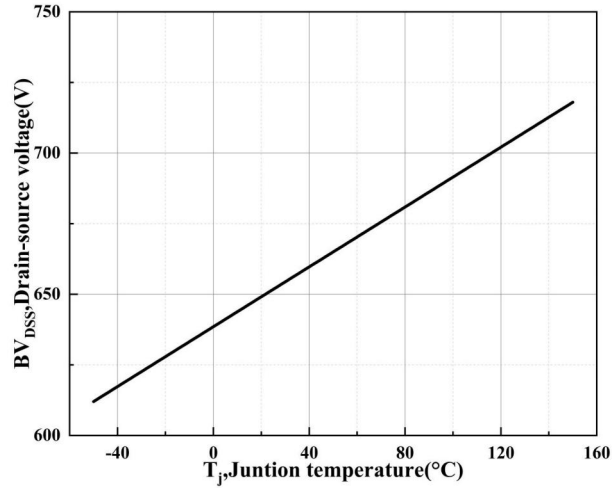


Figure 5. Drain-source Breakdown Voltage

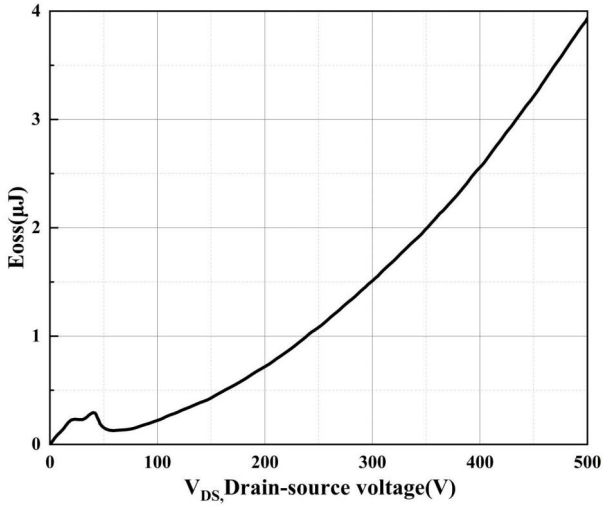
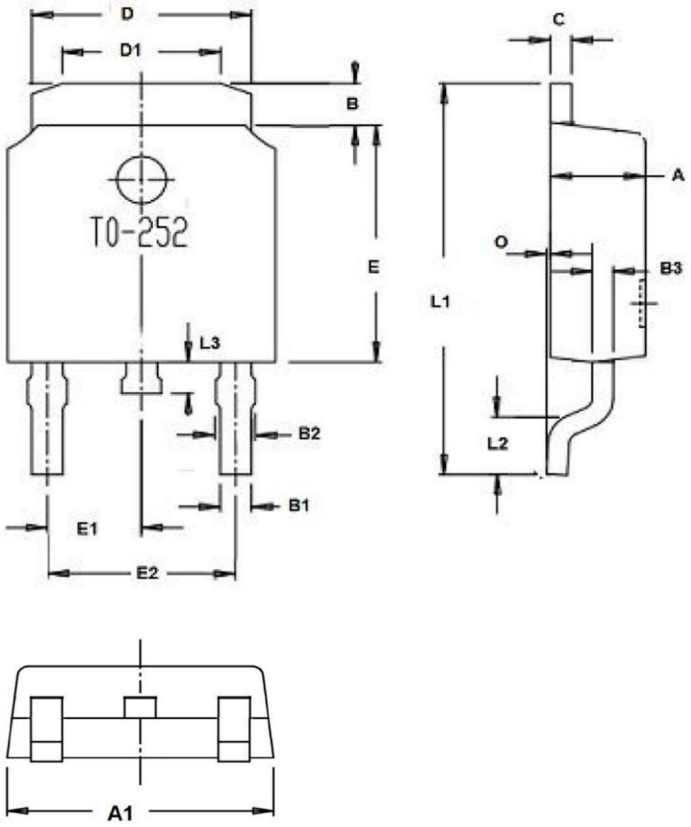


Figure 6. Typical C_{oss} Stored Energy

Package Information

TO-252



Dim.	Min.	Max.
A	2.1	2.5
A1	6.3	6.9
B	0.96	1.42
B1	0.74	0.86
B2	0.74	0.94
C	Typ0.5	
D	5.33	5.53
D1	3.65	4.05
E	6.0	6.2
E1	Typ2.29	
E2	Typ4.58	
O	0	0.15
L1	9.9	10.5
L2	Typ1.65	
L3	0.6	1.0
All Dimensions in millimeter		

DISCLAIMER NOTICE

Rectron Inc reserves the right to make changes without notice to any product specification herein, to make corrections, modifications, enhancements or other changes. Rectron Inc or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies. Data sheet specifications and its information contained are intended to provide a product description only. "Typical" parameters which may be included on RECTRON data sheets and/ or specifications can and do vary in different applications and actual performance may vary over time. Rectron Inc does not assume any liability arising out of the application or use of any product or circuit.

Rectron products are not designed, intended or authorized for use in medical, life-saving implant or other applications intended for life-sustaining or other related applications where a failure or malfunction of component or circuitry may directly or indirectly cause injury or threaten a life without expressed written approval of Rectron Inc. Customers using or selling Rectron components for use in such applications do so at their own risk and shall agree to fully indemnify Rectron Inc and its subsidiaries harmless against all claims, damages and expenditures.