RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

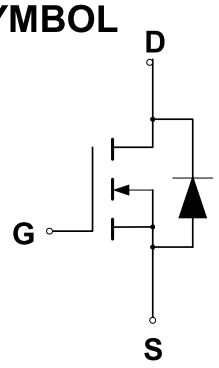
RM80N650T7

Super-junction Power Mosfet

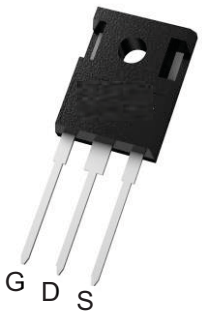
Feature

- 650V,80A
  $R_{DS(ON)}$ <41mΩ@V_{GS}=10V
- Ultra-fast body didode
- Good Reliability
- Fast switching speed
- Extremely low losses due to very Eon and Eoff
- Qualified for industrial grade applications according to JEDEC
- RoHs compliant

SYMBOL



TO-247-3L



Application

- Swith Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- Charge
- Halogen-free

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
80N650	RM80N650T7	TO-247-3L	-	-	600 per box

ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GSS}	±30	V
Continuous Drain Current (T_a =25℃)	I_D	80	A
Pulsed Drain Current (1)	I_{DM}	240	A
Avalanche Current (Signle pulse) (1)	I_{AS}	16	A
Single Pulsed Avalanche Energy (2)	E_{AS}	1280	mJ
Power Dissipation	P_D	465	W
Thermal Resistance from Junction to Ambient(4)	$R_{\theta JA}$	61	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

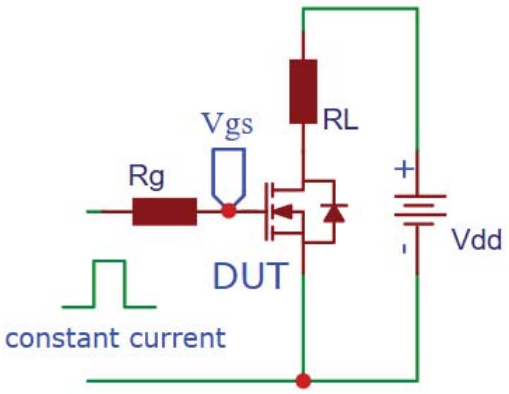
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =1mA	650	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =650V, V_{GS} = 0V,T_j=25℃	-	-	10	mA
		V_{DS} =650V, V_{GS} = 0V,T_j=150℃	-	1	-	
Gate-body leakage current	I_{GSS}	V_{GS} =±30V,V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =2mA	3.5	4	4.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =10A T_j=25℃	-	37	41	mΩ
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =10A T_j=150℃	-	93	-	mΩ
Gate Resistance	R_G	f=1.0MHZ open drain	-	6	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =100KHz	-	9886	-	pF
Output Capacitance	C_{oss}		-	4201	-	
Reverse Transfer Capacitance	C_{rss}		-	4.3	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=400V, I_D=40A, R_G=2Ω,VGS=10V	-	46.8	-	ns
Turn-on rise time	t_r		-	56.8	-	
Turn-off delay time	$t_{d(off)}$		-	194.4	-	
Turn-off fall time	t_f		-	41.6	-	
Total Gate Charge	Qg	VDS=400V, ID=40A, VGS=10V	-	191.6	-	nC
Gate-Source Charge	Qgs		-	48.2	-	
Gate-Drain Charge	Qgd		-	69.6	-	
Source-Drain Diode characteristics						
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=1A	-	-	1.3	V
Peak Reverse Recovery Current	I_{rrm}	V_R=400v,IF=40A,di_F/dt=100A/us	-	8.7	-	A
Reverse Recovery Time	Q_{rr}		-	0.832	-	uC
Reverse Recovery Charge	T_{rr}		-	146.4	-	ns

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=50V,R_G=25Ω,L=10mH
3. Identical low side and high side switch with identical R_G

Test Circuits （Tj = 25°C）

Gate Charge test circuit



Gate Charge waveform

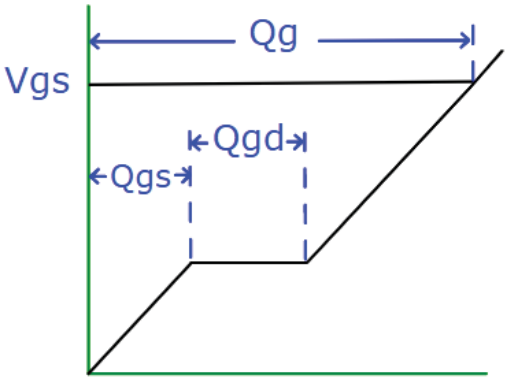
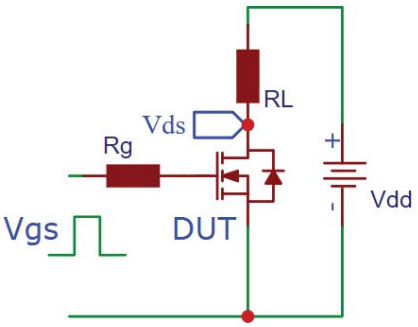


Table 1　Gate Charge Test Circuit and Waveform

Switching Time test circuit



Switching Time waveform

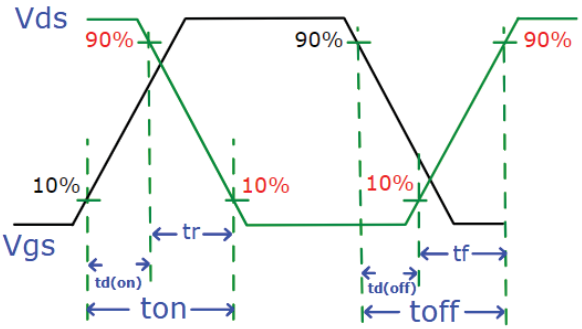
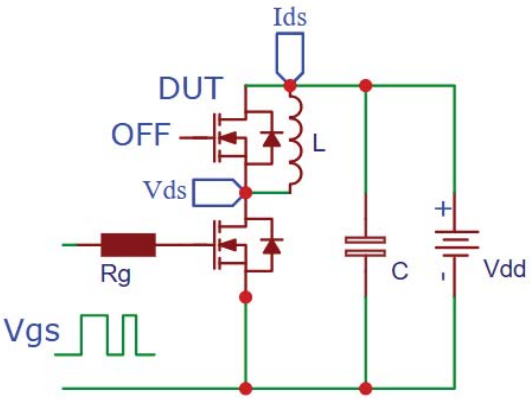


Table 2　Switching Time Test Circuit and Waveform

Diode Recovery test circuit



Diode Recovery waveform

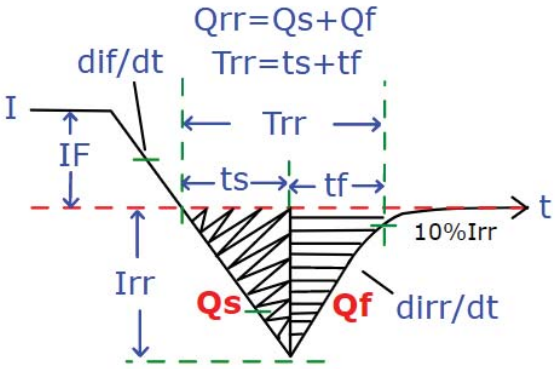
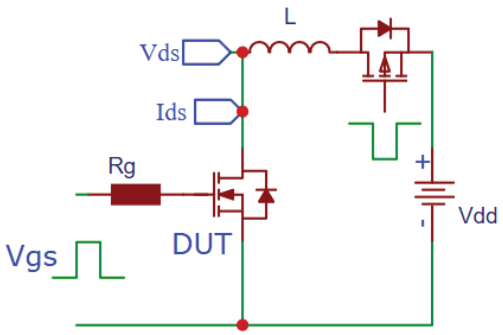


Table 3 Diode Recovery Test Circuit and Waveform

Unclamped inductive load test circuit



Unclamped inductive waveform

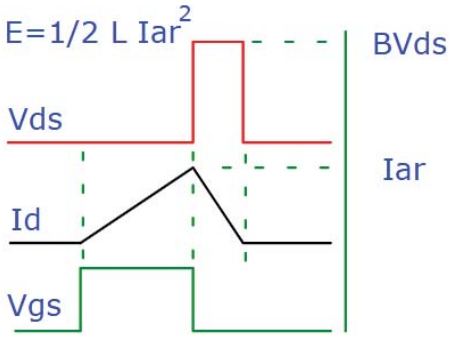
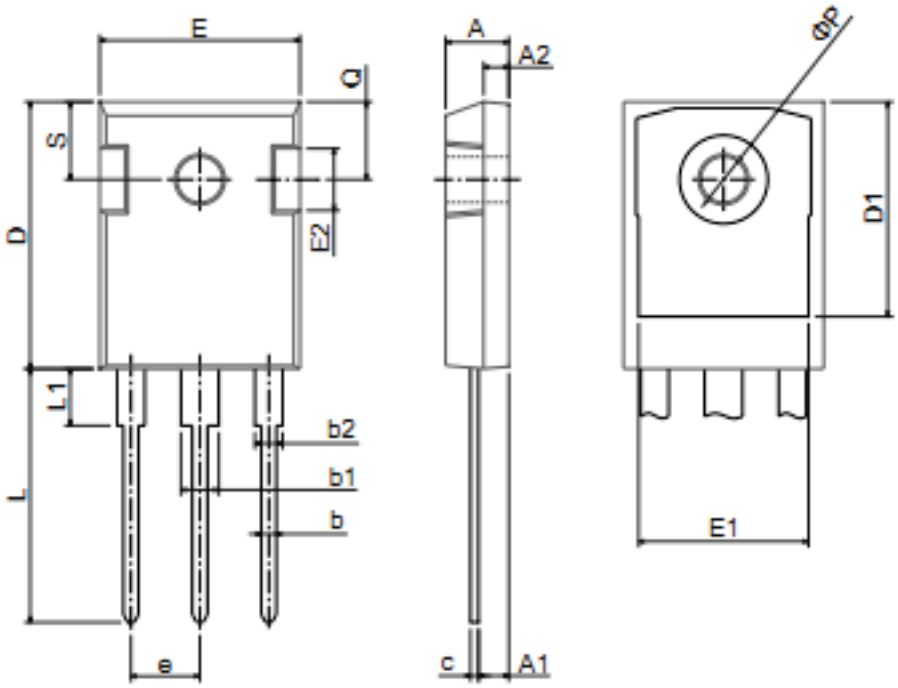


Table 4 Unclamped_inductive Test Circuit and Waveform

TO-247 Package Information



Dimension	Min(mm)	Max(mm)
A	4.70	5.31
A1	2.20	2.60
A2	1.50	2.49
b	0.99	1.40
b1	2.59	3.43
b2	1.65	2.39
c	0.38	0.89
D	20.30	21.46
D1	13.08	-
E	15.45	16.26
E1	13.06	14.02
E2	4.32	5.49
e	5.45BSC	
L	19.81	20.57
L1	-	4.50
ΦP	3.50	3.70
Q	5.38	6.20
S	6.15BSC	

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