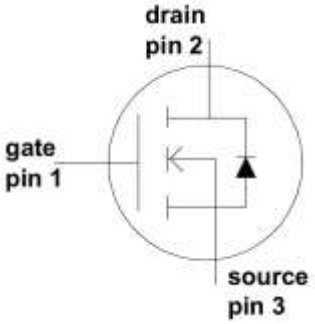
APC65R041WMF

Super-junction Power Mosfet

DATA SHEET

Feature

- 650V,66A
  $R_{DS(ON)}$ <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



TO-247-3L



Application

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

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
65R041	APC65R041WMF	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	66	A
Continuous Drain Current (T_a =100℃)	I_D	42	A
Pulsed Drain Current (1)	I_{DM}	198	A
Single Pulsed Avalanche Energy (2)	E_{AS}	2185	mJ
Power Dissipation	P_D	416	W
Thermal Resistance from Junction to Ambient(3)	$R_{\theta JA}$	32	℃/W
Thermal Resistance from Junction to Case(3)	$R_{\theta JC}$	0.3	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

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

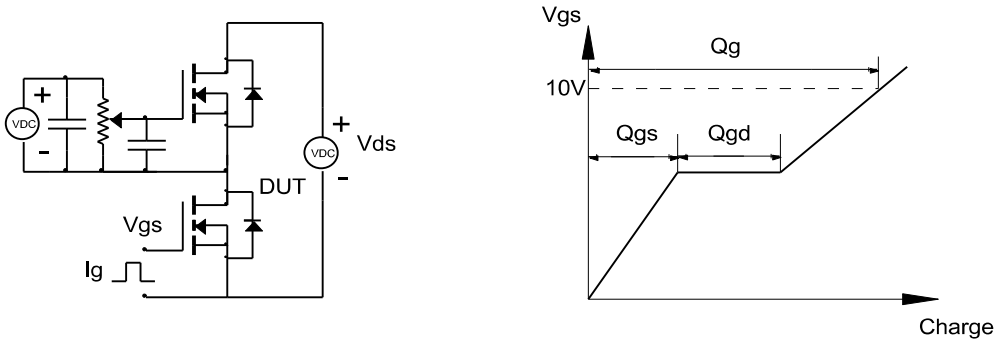
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =1mA	650	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =650V, V_{GS} = 0V,T_j=25℃	-	-	3.5	mA
		V_{DS} =650V, V_{GS} = 0V,T_j=150℃	-	1	-	
Gate-body leakage current	I_{GSS}	V_{GS} =±30V,V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =3.3mA	3.0	3.5	4.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =33A	-	34	41	mΩ
Gate Resistance	R_G	f=1.0MHZ open drain	-	1.8	-	Ω
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =100V, V_{GS} =0V, f =1MHz	-	6715	-	pF
Output Capacitance	C_{oss}		-	245	-	
Reverse Transfer Capacitance	C_{rss}		-	4.3	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=400V, I_D=50A, R_G=2Ω,VGS=13V	-	19.3	-	ns
Turn-on rise time	t_r		-	21	-	
Turn-off delay time	$t_{d(off)}$		-	54.8	-	
Turn-off fall time	t_f		-	63.5	-	
Total Gate Charge	Qg	VDS=480V, ID=50A, VGS=10V	-	172	-	nC
Gate-Source Charge	Qgs		-	40	-	
Gate-Drain Charge	Qgd		-	83	-	
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:

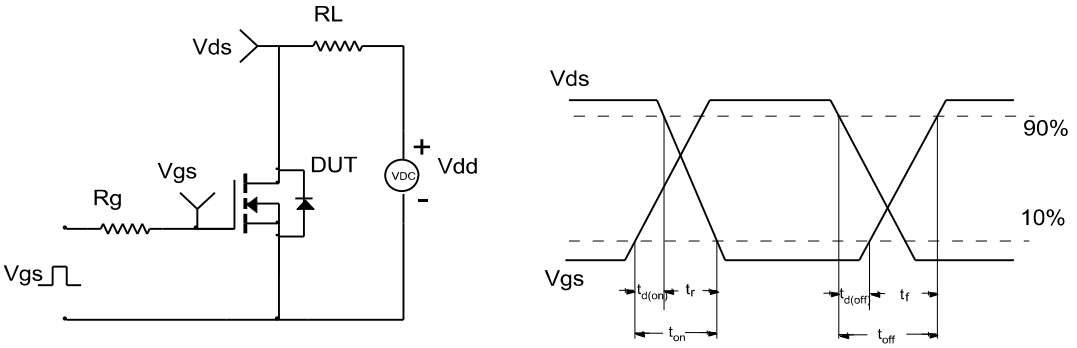
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=100V,R_G=25Ω,L=80mH
3. Mount on minimum PCB layout

Test Circuit and Waveform

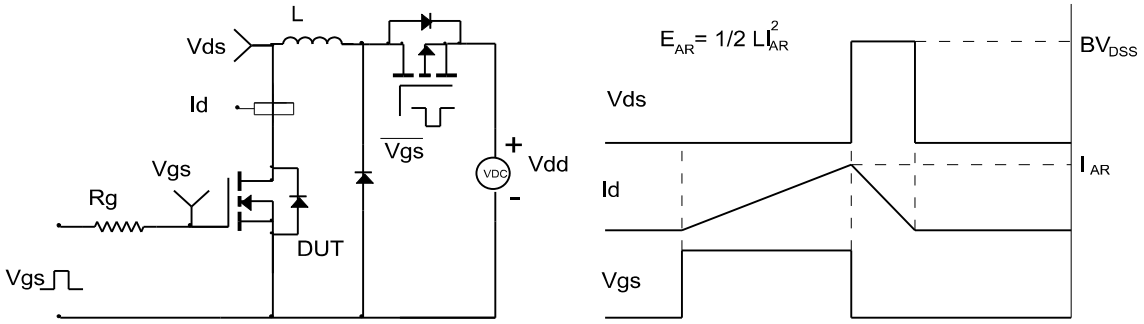
Gate Charge Test Circuit & Waveform



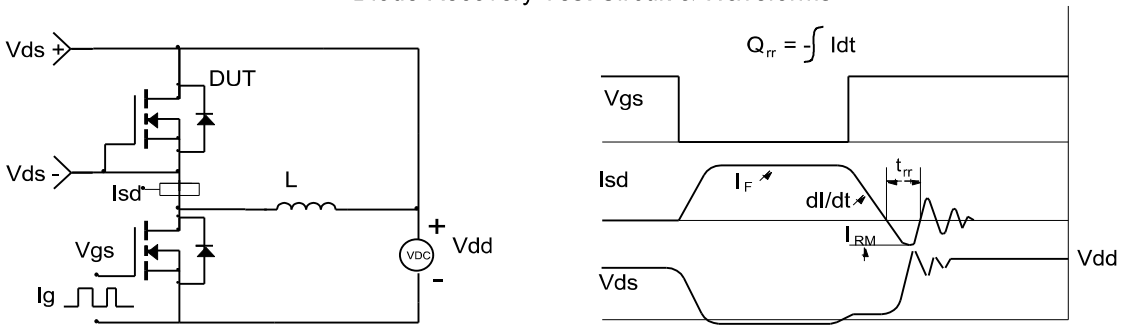
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Electrical Characteristics Diagrams

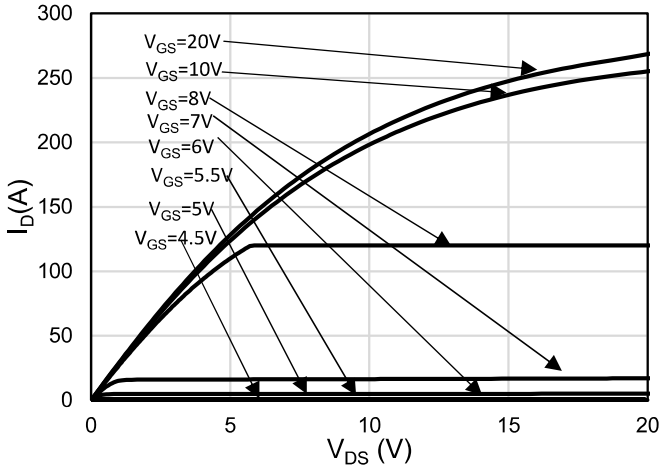


Figure 1: On-Region Characteristics

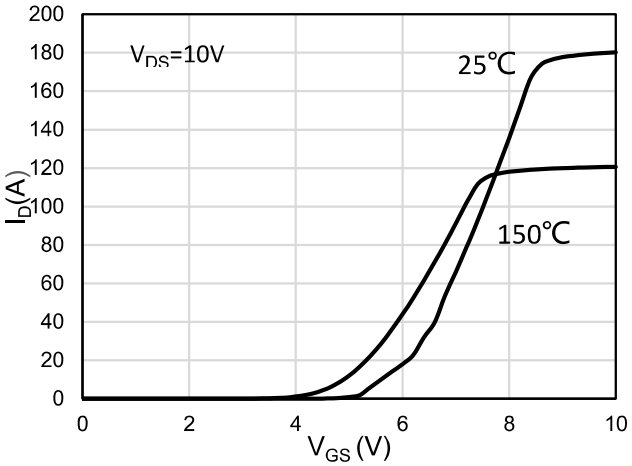


Figure 2: Transfer Characteristics

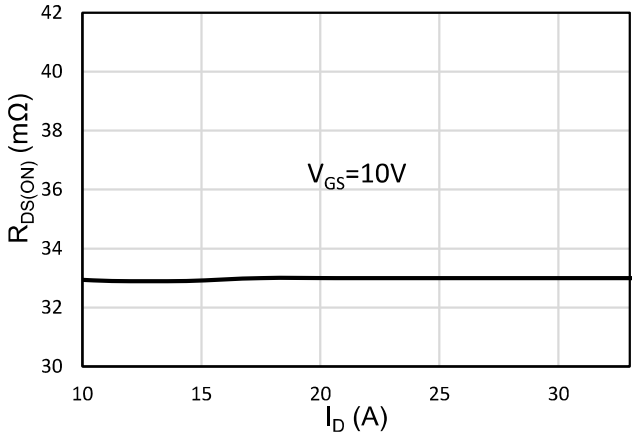


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

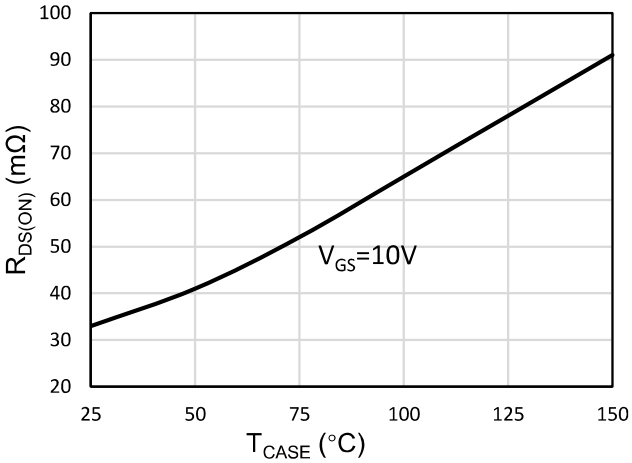


Figure 4: On-Resistance vs. T_{CASE}

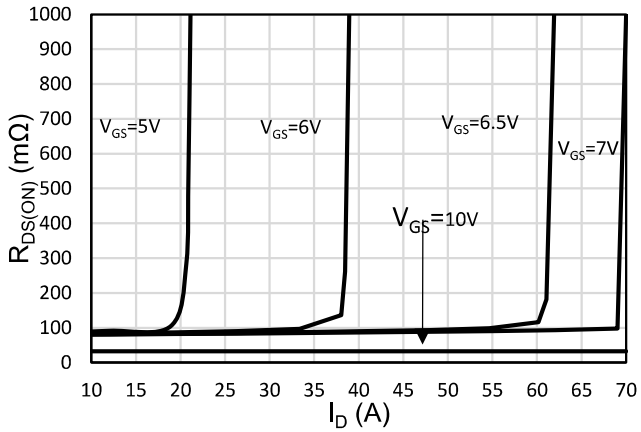


Figure 5: On-Resistance vs. Drain Current and Gate Voltage

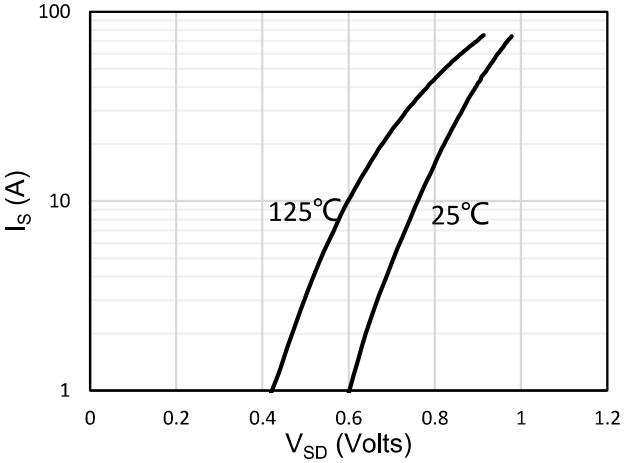


Figure 6: Body-Diode Characteristics

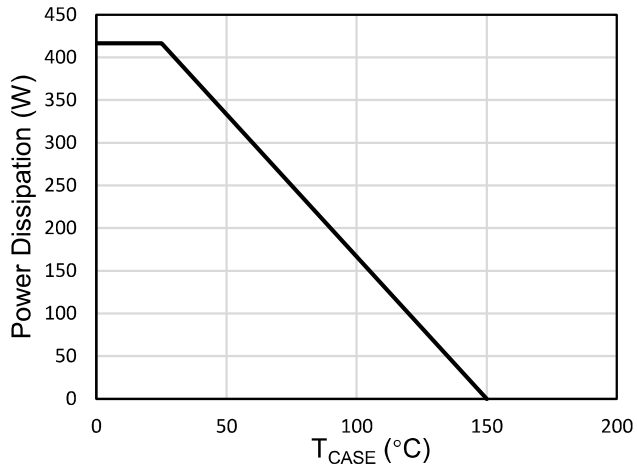


Figure 7: Power De-rating

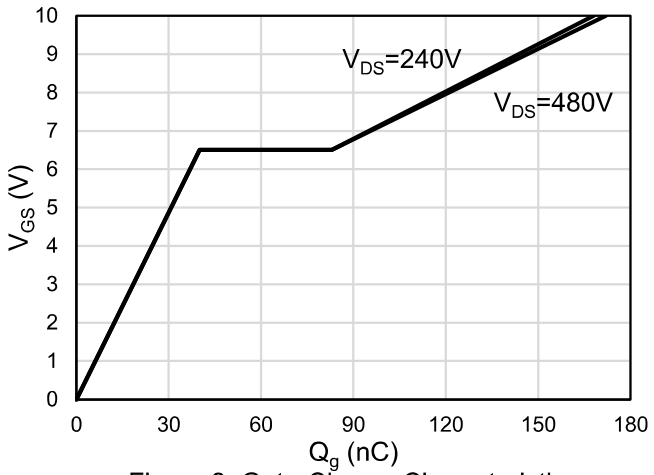


Figure 8: Gate-Charge Characteristics

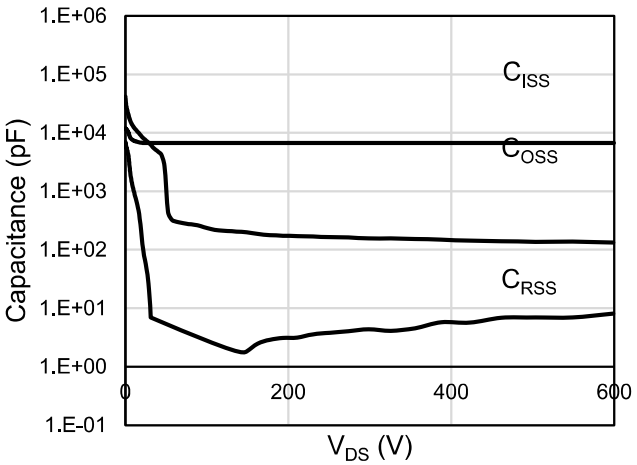


Figure 9: Capacitance Characteristics

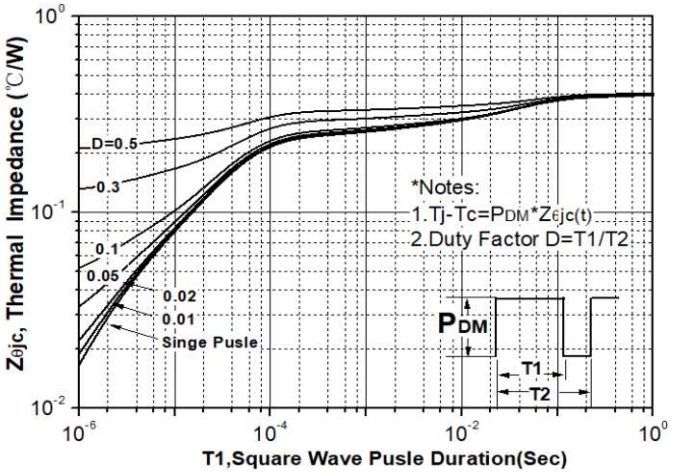
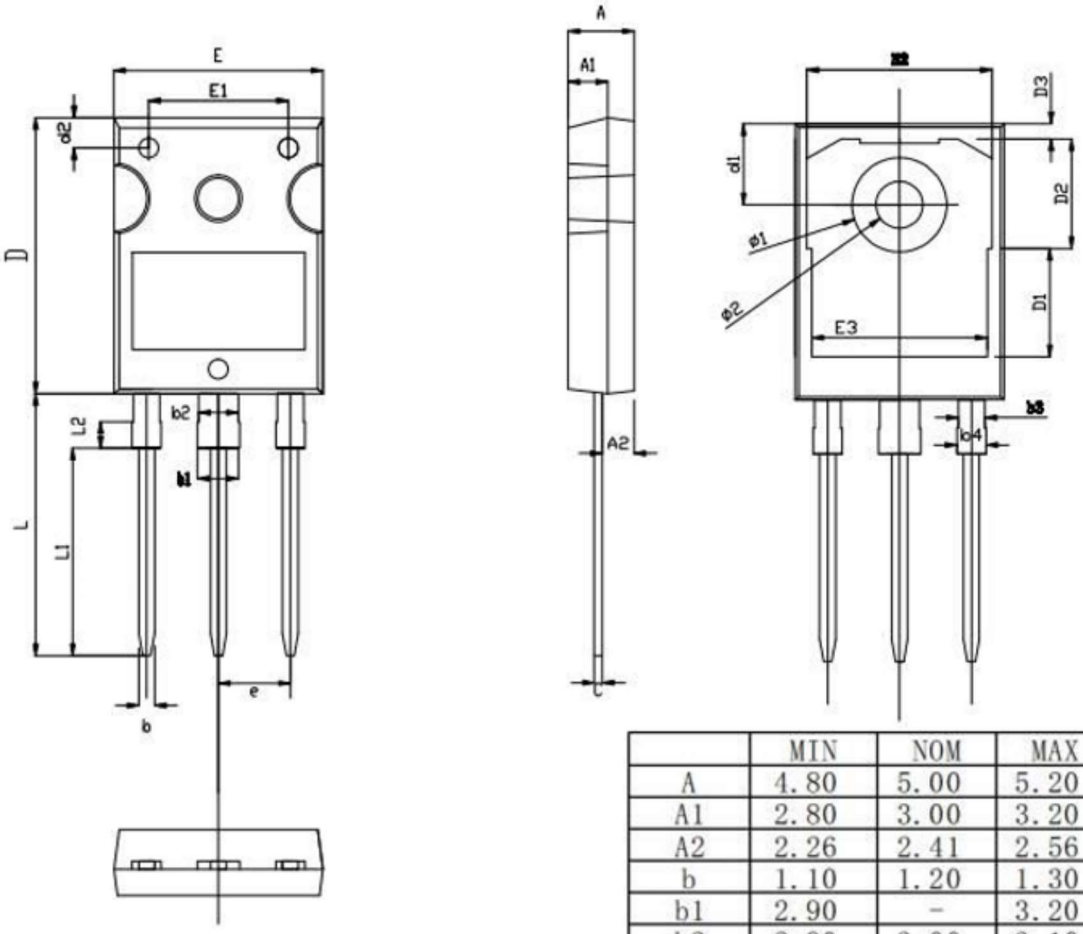
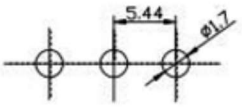


Figure 10: Transient Thermal Response Curve

TO-247-3L PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



UNIT: mm

	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.80	3.00	3.20
A2	2.26	2.41	2.56
b	1.10	1.20	1.30
b1	2.90	-	3.20
b2	2.90	3.00	3.10
b3	1.90	2.00	2.10
b4	2.00	-	2.20
c	0.50	0.60	0.70
D	20.80	21.00	21.20
D1		8.23	
D2		8.32	
D3		1.17	
d1	6.00	6.15	6.30
d2	2.20	2.30	2.40
E	15.60	15.80	16.00
E1		10.50	
E2		14.02	
E3		13.50	
e	5.34	5.44	5.54
L	19.72	19.92	20.12
L1		15.79	
L2		1.98	
ø1	7.10	7.19	7.30
ø2	3.50	3.60	3.70