

N-CHANNEL MOSFET

RCP80N06A/RCS80N06A/RCD80N06A

MAIN CHARACTERISTICS

ID	80A
VDSS	60 V
Rdson-typ (@Vgs=10V)	8.5 mΩ
Qg-typ	45nC

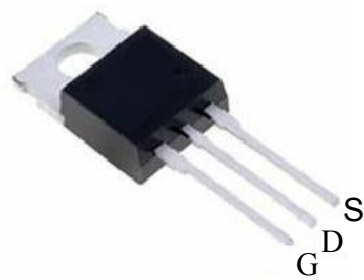
FEATURES

低栅极电荷	Low gate charge
低 Crss (典型值 142pF)	Low Crss (typical142pF)
开关速度快	Fast switching
100%经过雪崩测试	100% avalanche tested
高抗 dv/dt 能力	Improved dv/dt capability
RoHS 产品	RoHS product

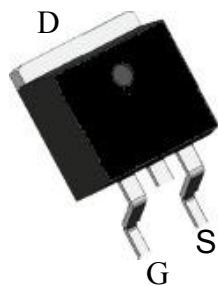
APPLICATIONS

电池管理系统	BMS
电机控制和驱动	Motor control and drive
不间断电源	UPS

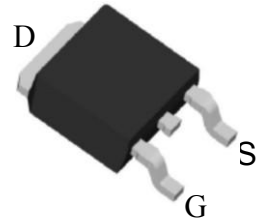
Package



TO-220
RCP series

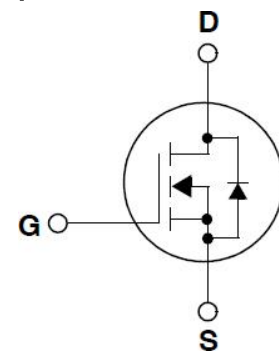


TO-263
RCS series



TO-252
RCD series

Equivalent Circuit



ABSOLUTE RATINGS (Tc=25°C)

项目 Parameter	符号 Symbol	数值 Value			单位 Unit
		RCP80N06A	RCS80N06A	RCD80N06A	
最高漏极-源极直流电压 Drain-Source Voltage	V _{DS}	60			V
连续漏极电流* Drain Current -continuous *	I _D (T _C =25°C)	80			A
	I _D (T _C =100°C)	53			A
最大脉冲漏极电流 (注 1) Drain Current – pulse (note 1)	I _{DM}	320			A
最高栅源电压 Gate-Source Voltage	V _{GS}	±20			V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	E _{AS}	50			mJ
雪崩电流 (注 1) Avalanche Current (note 1)	I _{AR}	10			A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	E _{AR}	4			mJ
二极管反向恢复最大电压变化速率 (注 3) Peak Diode Recovery dv/dt (note 3)	dv/dt	5.0			V/ns
耗散功率 Power Dissipation	P _D (T _C =25°C)	195	195	88	W
	-Derate above 25°C	0.6	0.6	0.7	W/°C
最高结温及存储温度 Operating and Storage Temperature Range	T _J , T _{STG}	-55~+150			°C
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T _L	300			°C

*漏极电流由最高结温限制

*Drain current limited by maximum junction temperature

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ELECTRICAL CHARACTERISTICS

项目 Parameter	符号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
关态特性 Off –Characteristics						
漏-源击穿电压 Drain-Source Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	60	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /Δ T _J	I _D =250μA, referenced to 25°C	-	0.06	-	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V, T _C =25°C	-	-	1	μA
		V _{DS} =48V, T _C =125°C	-	-	100	μA
栅极体漏电流 Gate-body leakage current	I _{GSS} (F/R)	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	1.3	1.6	2.3	V
静态导通电阻 Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V , I _D =30A	-	8.5	11	mΩ
		V _{GS} =4.5V , I _D =25A	-	10.5	13	
正向跨导 Forward Transconductance	g _{fs}	V _{DS} = 5V, I _D =30A (note 4)	-	65	-	S
动态特性 Dynamic Characteristics						
栅电阻 Gate Resistance	R _g	f=1.0MHz, V _{DS} OPEN	-	1.2	-	Ω
输入电容 Input capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1.0MHz	-	1940	-	pF
输出电容 Output capacitance	C _{oss}		-	197	-	
反向传输电容 Reverse transfer capacitance	C _{rss}		-	142	-	
开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	t _{d(on)}	V _{DD} =30V, I _D =30A, R _G =2.7Ω V _{GS} =10V (note 4, 5)	-	10	-	ns
上升时间 Turn-On rise time	t _r		-	50	-	ns
延迟时间 Turn-Off delay time	t _{d(off)}		-	30	-	ns
下降时间 Turn-Off Fall time	t _f		-	72	-	ns
栅极电荷总量 Total Gate Charge	Q _g	V _{DS} =30V , I _D =30A , V _{GS} =10V (note 4, 5)	-	45	-	nC
栅-源电荷 Gate-Source charge	Q _{gs}		-	9	-	nC
栅-漏电荷 Gate-Drain charge	Q _{gd}		-	13	-	nC
漏-源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings						
正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current		I _S	-	-	80	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}	-	-	320	A
正向压降 Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =30A	-	0.8	1.3	V
反向恢复时间 Reverse recovery time	t _{rr}	V _{GS} =0V, I _S =30A ,dI _F /dt=100A/μs (note 4)	-	21	-	ns
反向恢复电荷 Reverse recovery charge	Q _{rr}		-	17	-	nC

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THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	RCP80N06A	RCS80N06A	RCD80N06A	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	0.65	0.65	1.42	°C/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	62.5	62.5	105	°C/W

注释:

- 1: 脉冲宽度由最高结温限制
- 2: L=1mH, IAS=10A, VDD=48V, RG=25 Ω, 起始结温 TJ=25°C
- 3: ISD ≤80A, di/dt ≤300A/μs, VDD ≤BV_{DSS}, 起始结温 TJ=25°C
- 4: 脉冲测试: 脉冲宽度 ≤300μs, 占空比 ≤2%
- 5: 基本与工作温度无关

Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: L=1mH, IAS=10A, VDD=48V, RG=25 Ω, Starting TJ=25°C
- 3: ISD ≤80A, di/dt ≤300A/μs, VDD ≤BV_{DSS}, Starting TJ=25°C
- 4: Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%
- 5: Essentially independent of operating temperature

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Typical Performance Characteristics

Fig 1: Output Characteristics

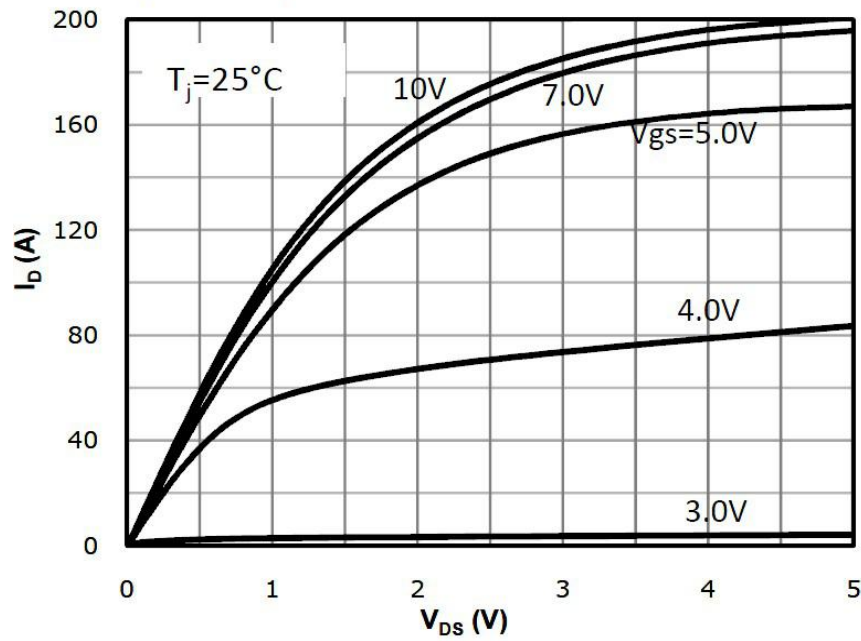


Fig 2: Transfer Characteristics

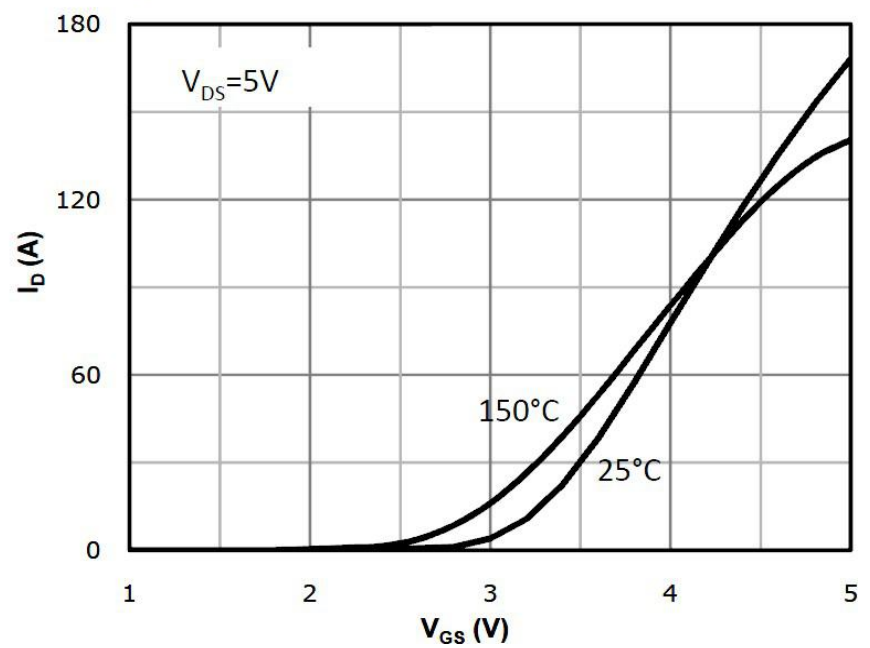


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

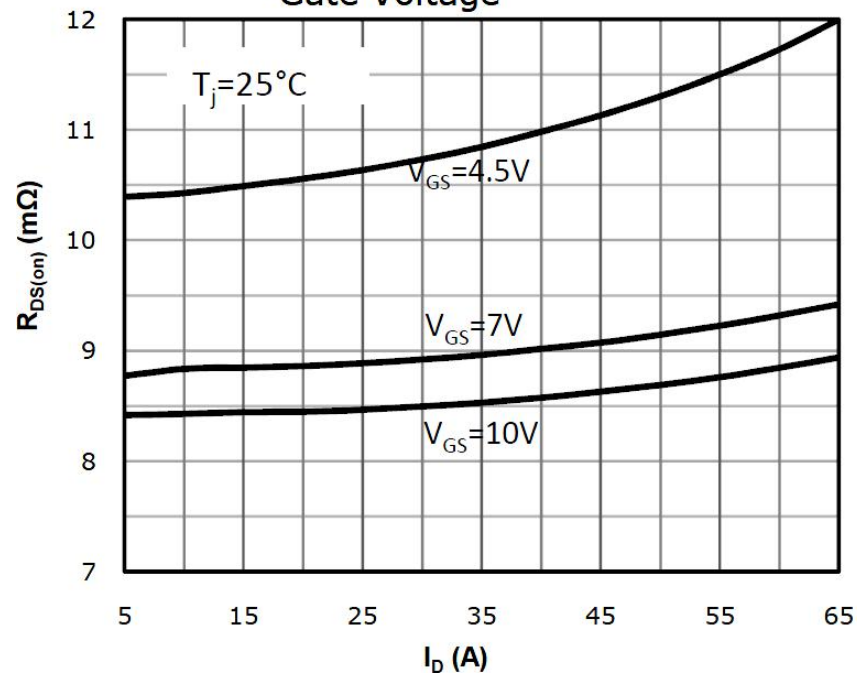


Fig 4: $R_{DS(on)}$ vs Gate Voltage

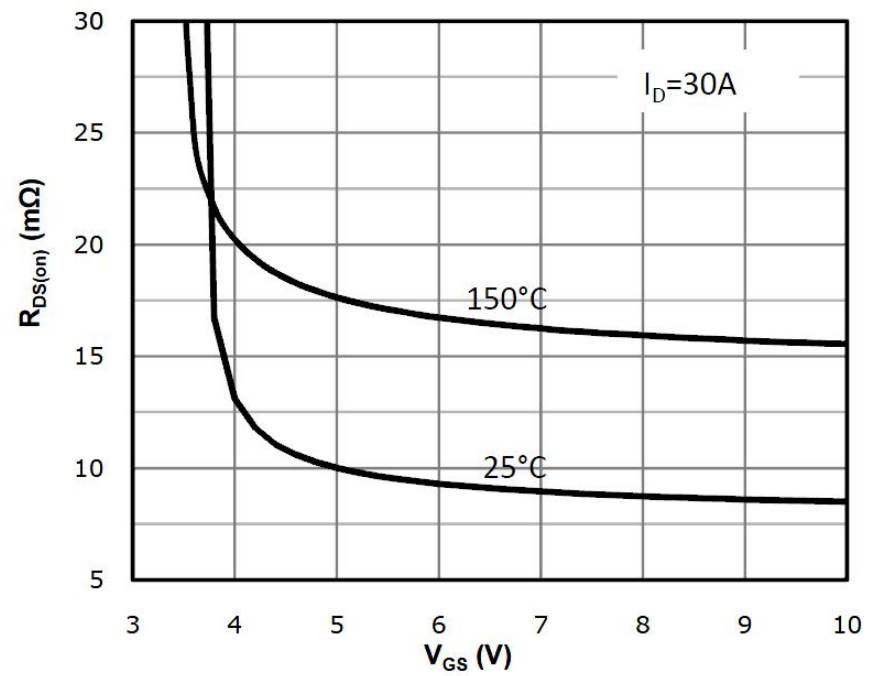


Fig 5: $R_{DS(on)}$ vs. Temperature

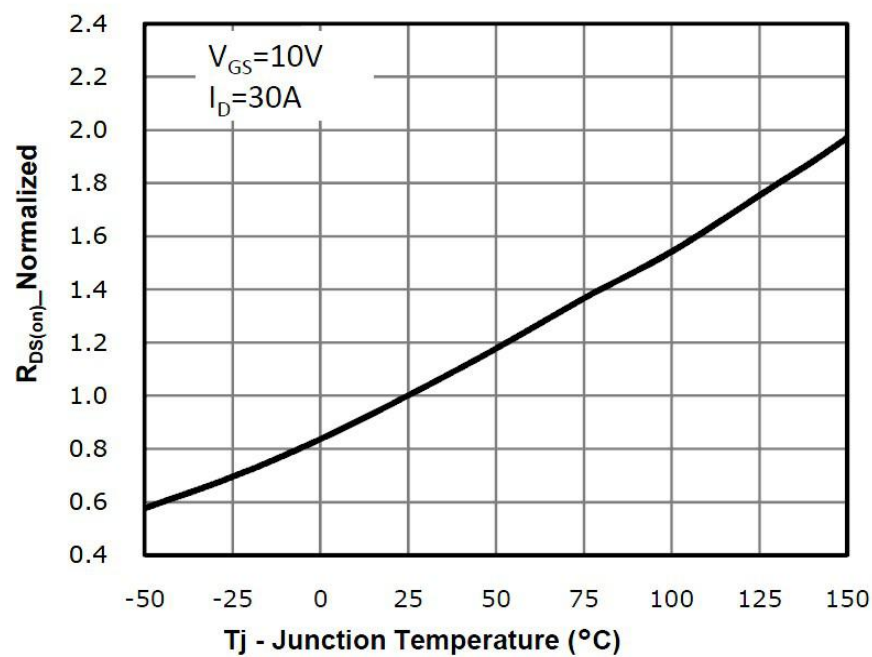
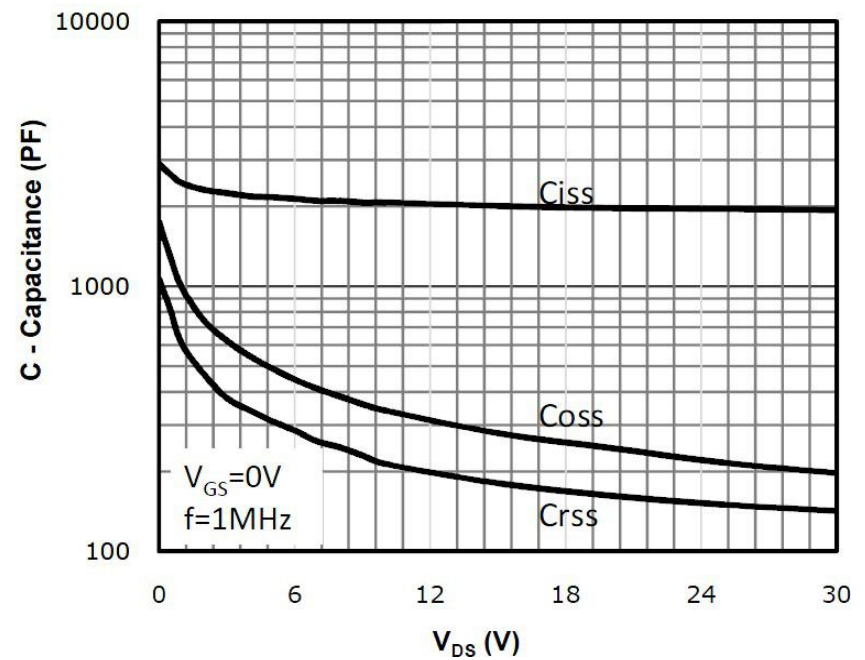


Fig 6: Capacitance Characteristics



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Fig 7: Gate Charge Characteristics

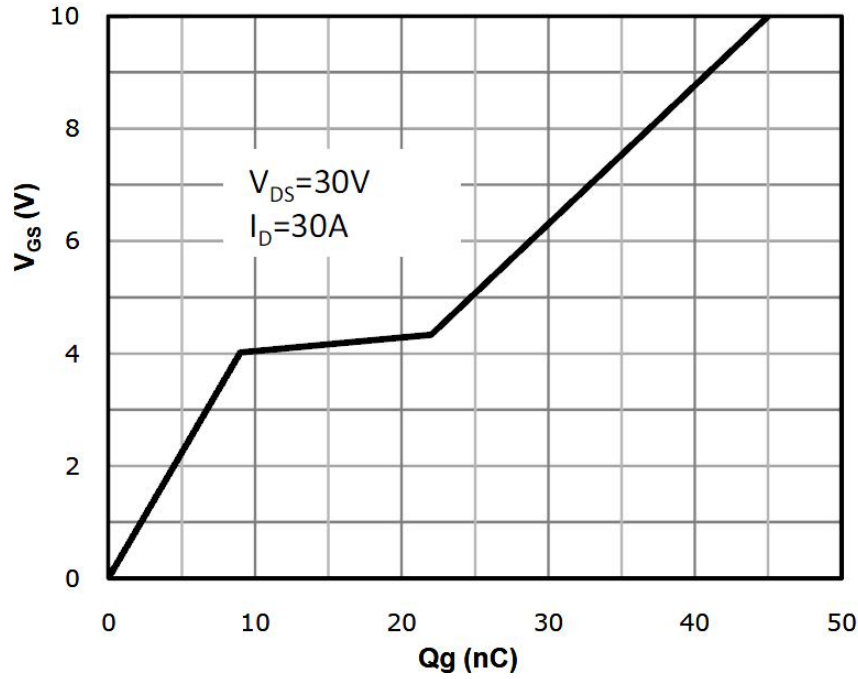


Fig 8: Body-diode Forward Characteristics

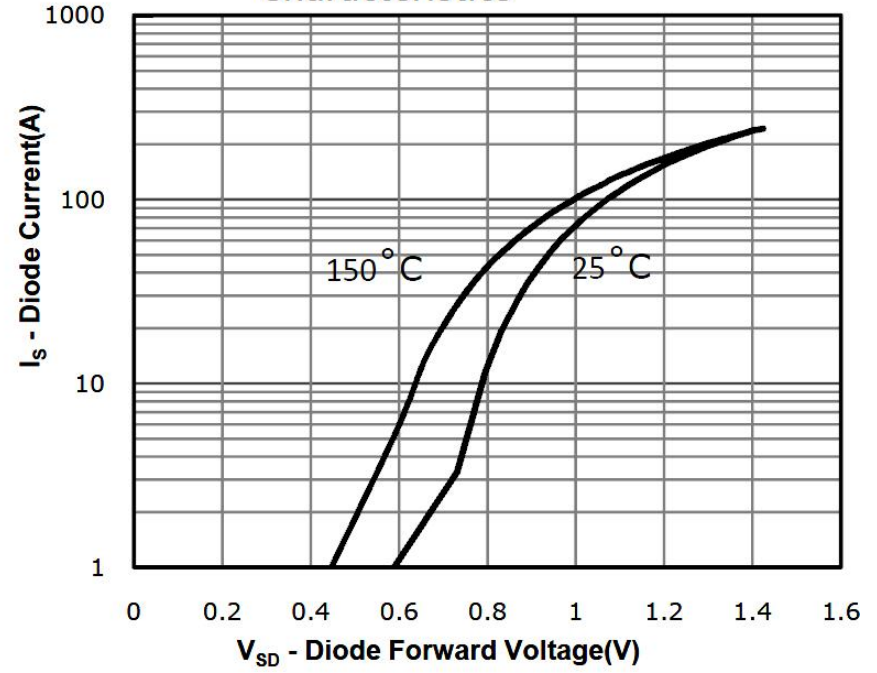


Fig 9: Power Dissipation

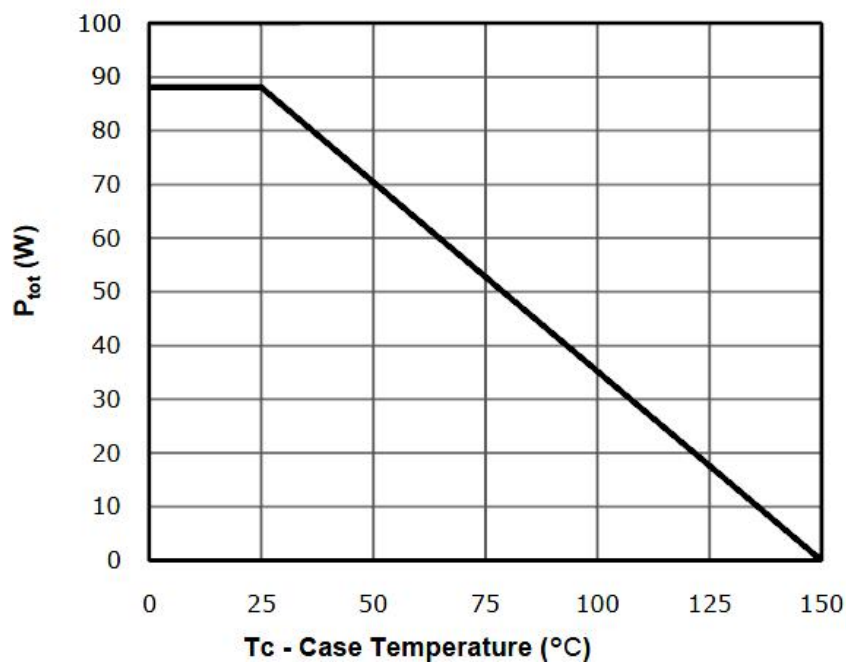


Fig 10: Drain Current Derating

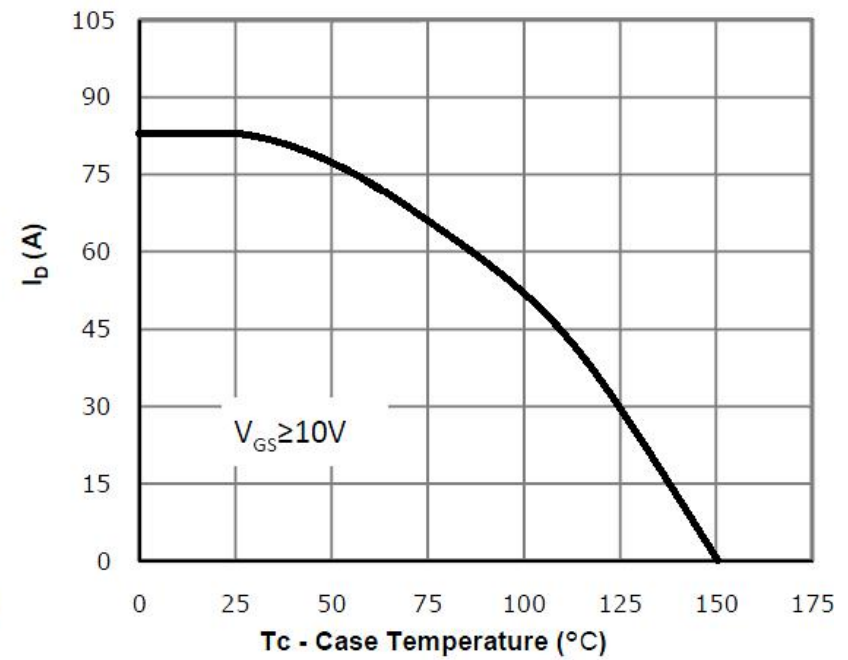
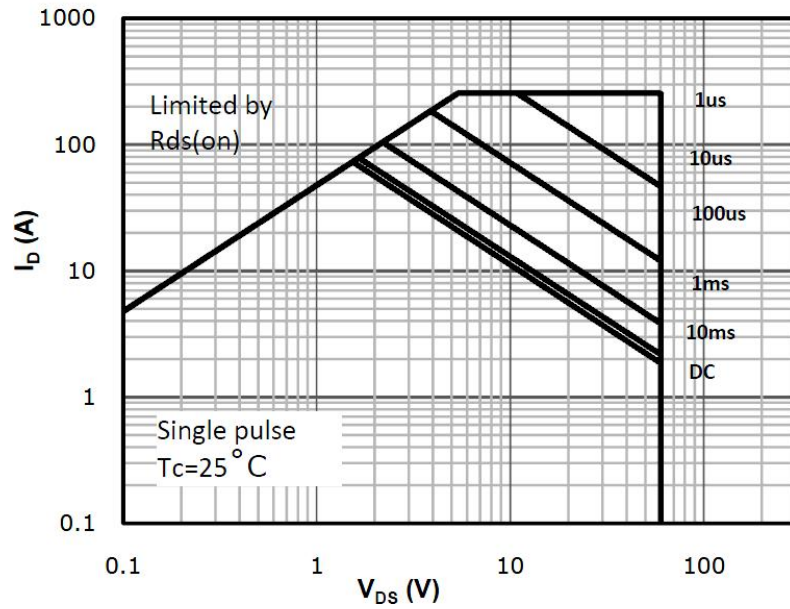
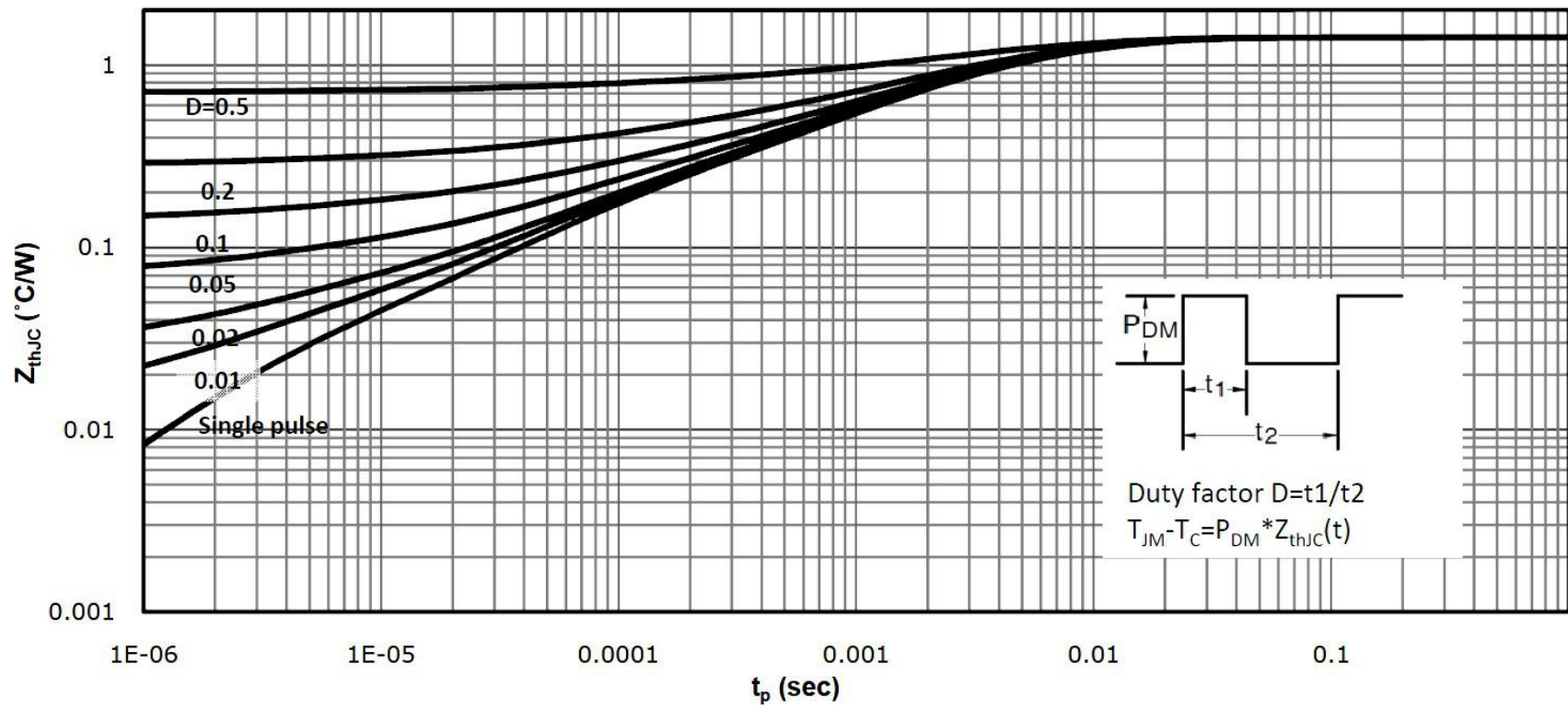


Fig 11: Safe Operating Area



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Fig 12: Max. Transient Thermal Impedance

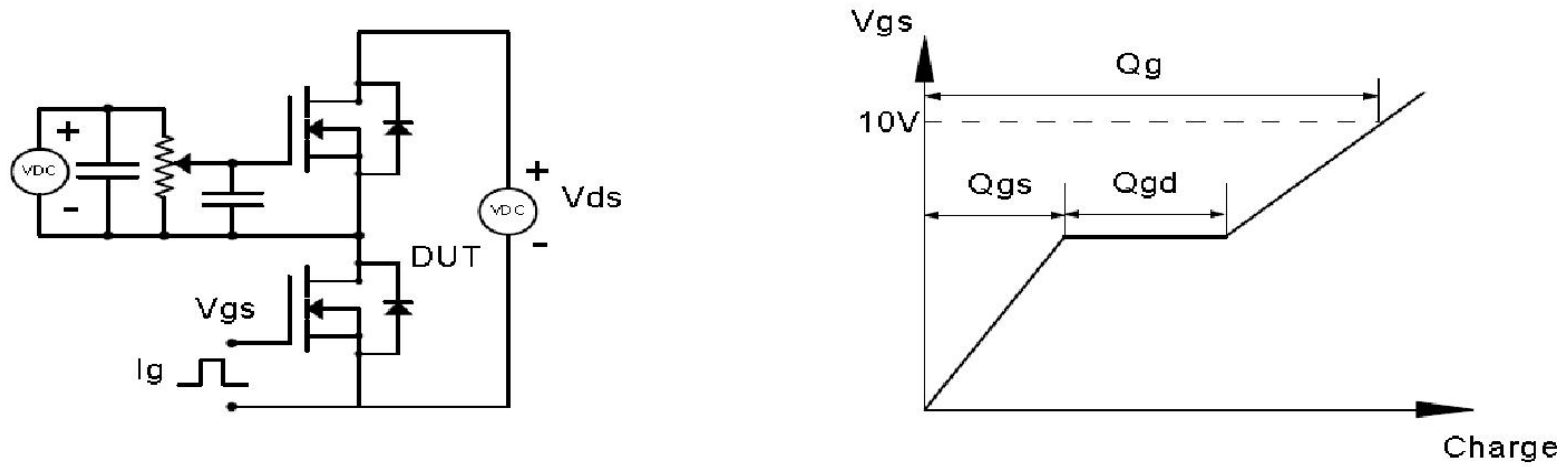


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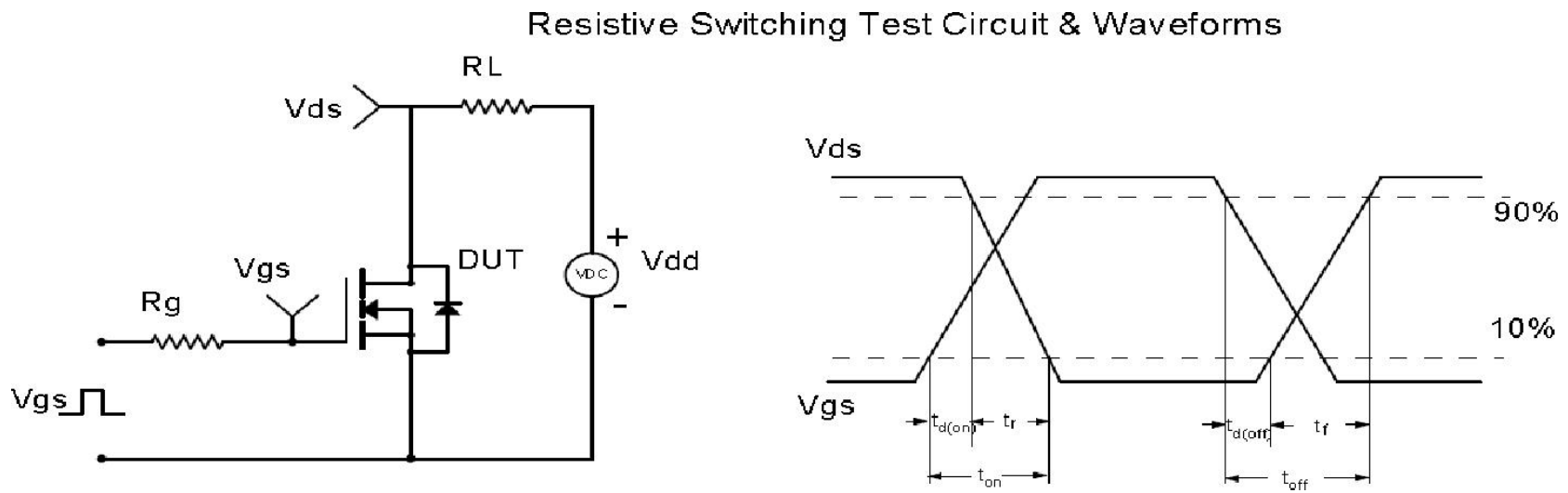
RCP80N06A/RCS80N06A/RCD80N06A

Test Circuit & Waveform

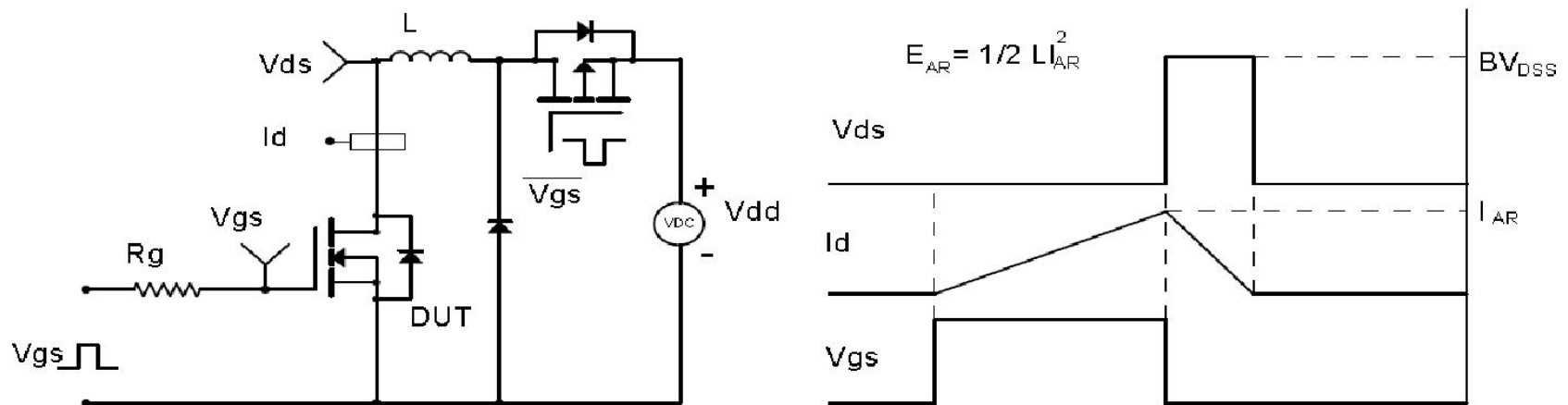
Gate Charge Test Circuit & Waveform



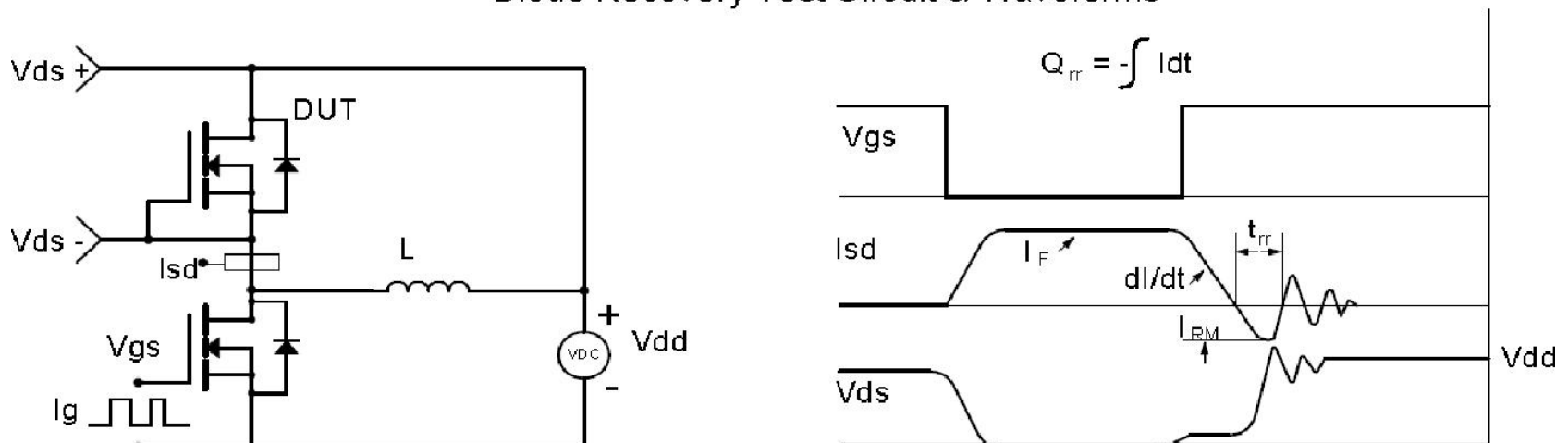
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

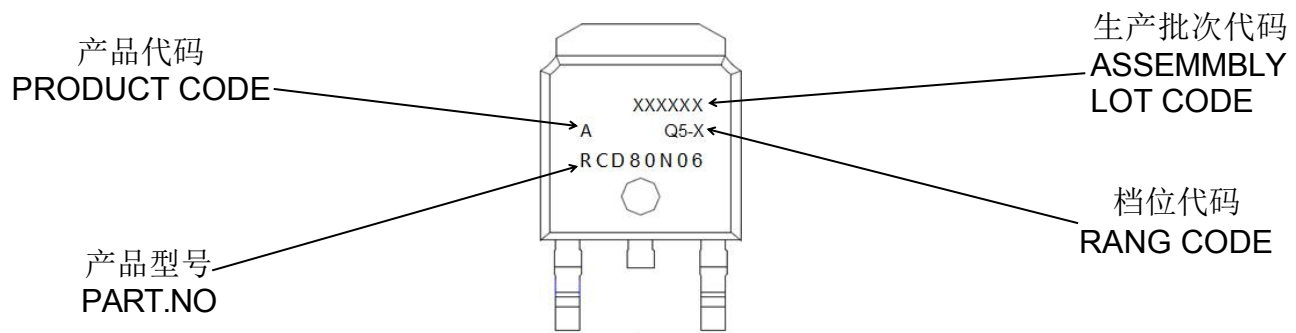
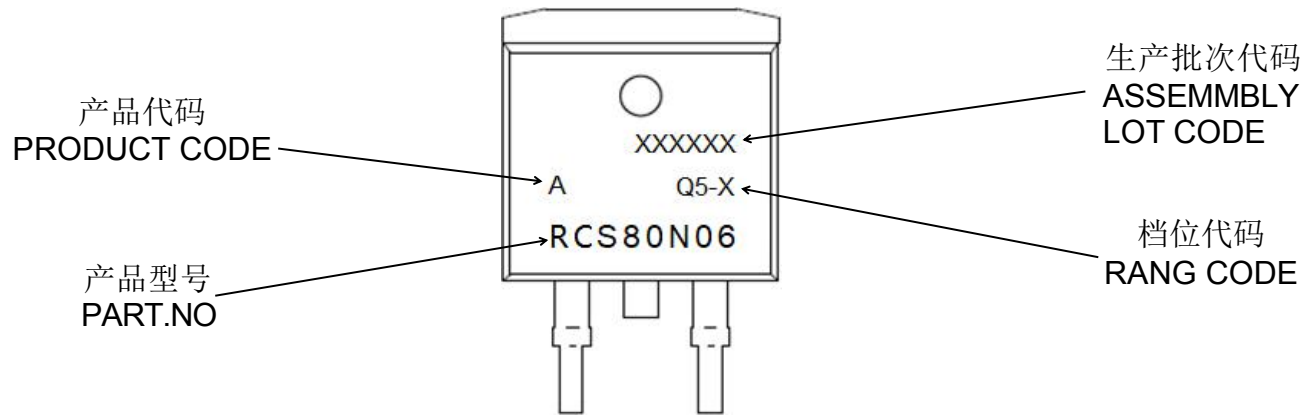
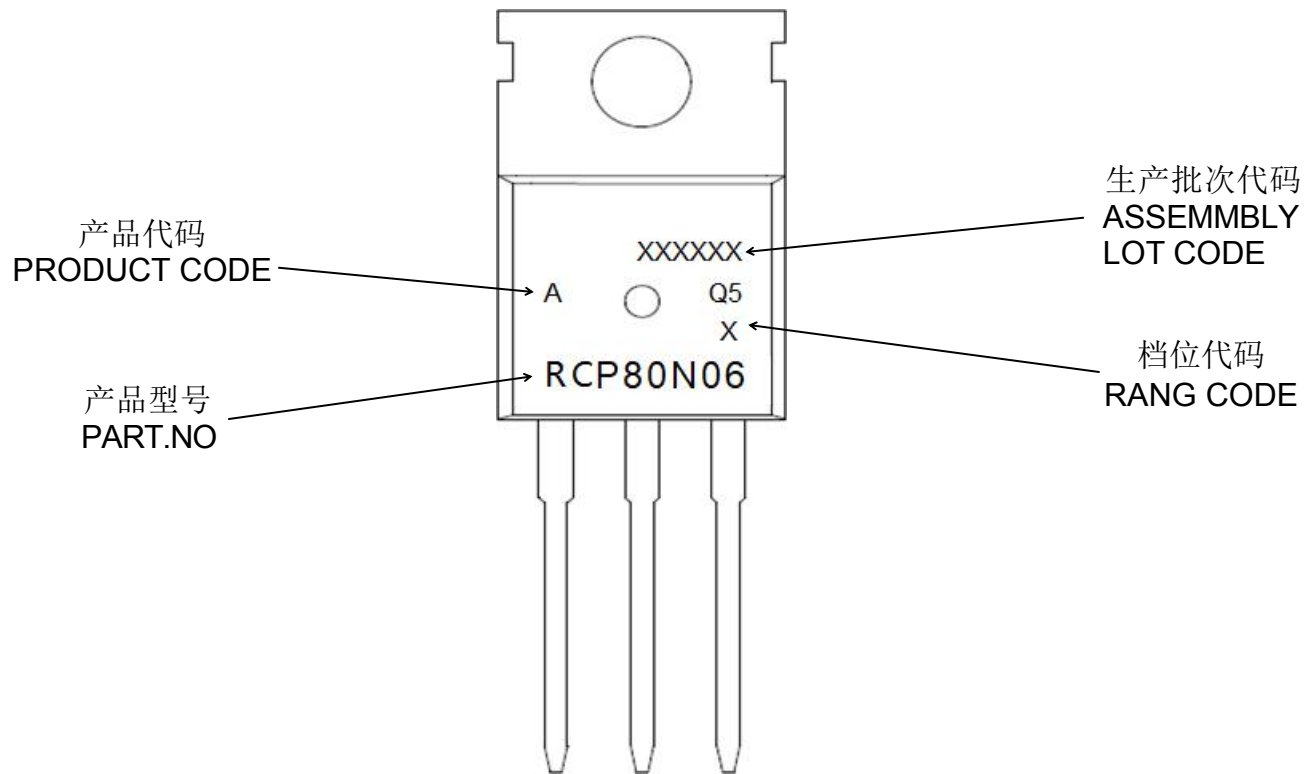


Diode Recovery Test Circuit & Waveforms



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Marking:

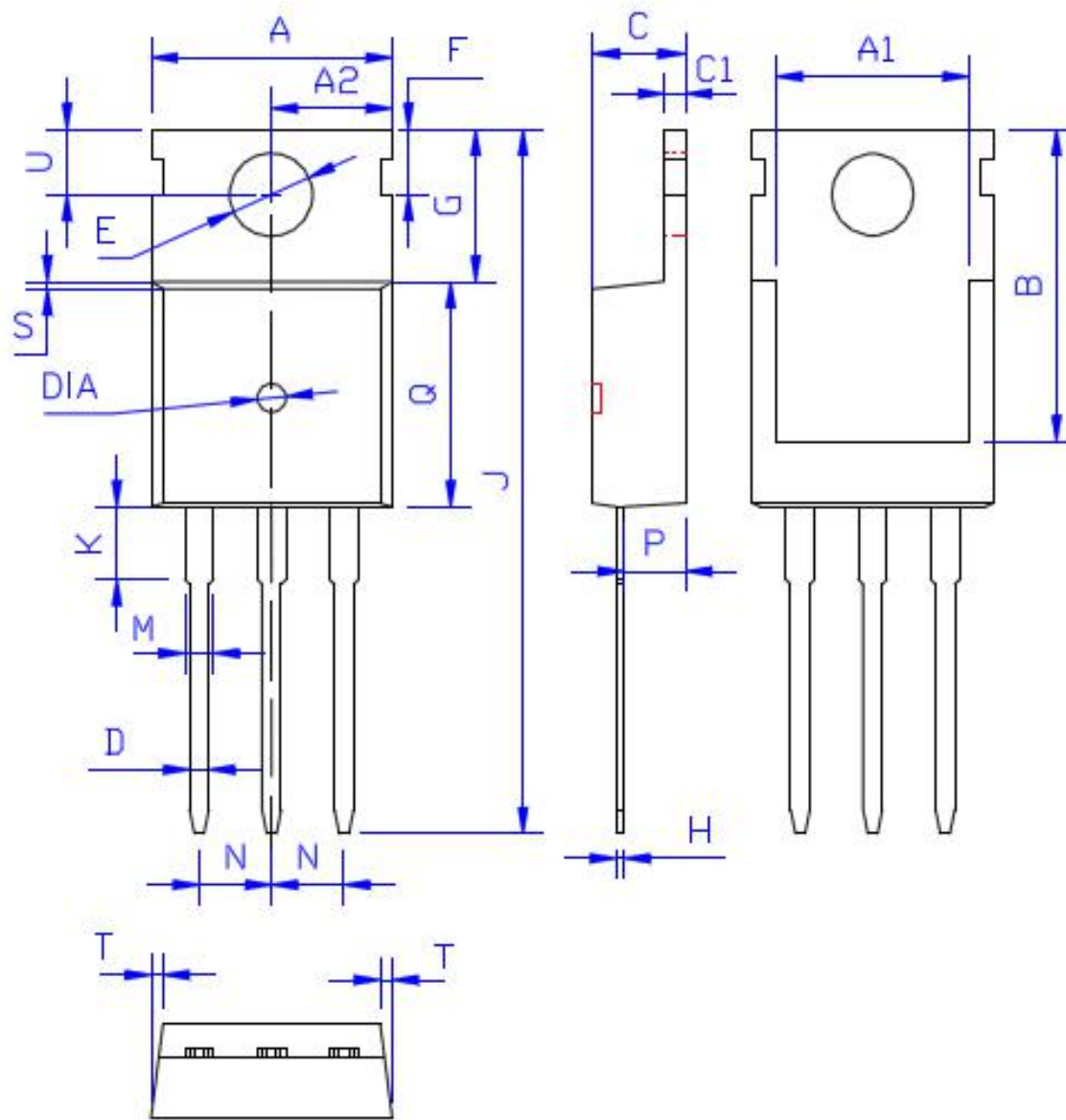


N-CHANNEL MOSFET
RCP80N06A/RCS80N06A/RCD80N06A

外形尺寸:

Package Dimension:

TO-220



DIM	MILLIMETERS
A	10.00 ± 0.30
A1	8.00 ± 0.30
A2	5.00 ± 0.30
B	13.20 ± 0.40
C	4.50 ± 0.20
C1	1.30 ± 0.20
D	0.80 ± 0.20
E	3.60 ± 0.20
F	3.00 ± 0.30
G	6.60 ± 0.40
H	0.50 ± 0.20
J	28.88 ± 0.50
K	3.00 ± 0.30
M	1.30 ± 0.30
N	Typical 2.54
P	2.40 ± 0.40
Q	9.20 ± 0.40
S	0.25 ± 0.15
T	0.25 ± 0.15
U	2.80 ± 0.30
DIA	宽 1.50 ± 0.10 深 0.50 MAX

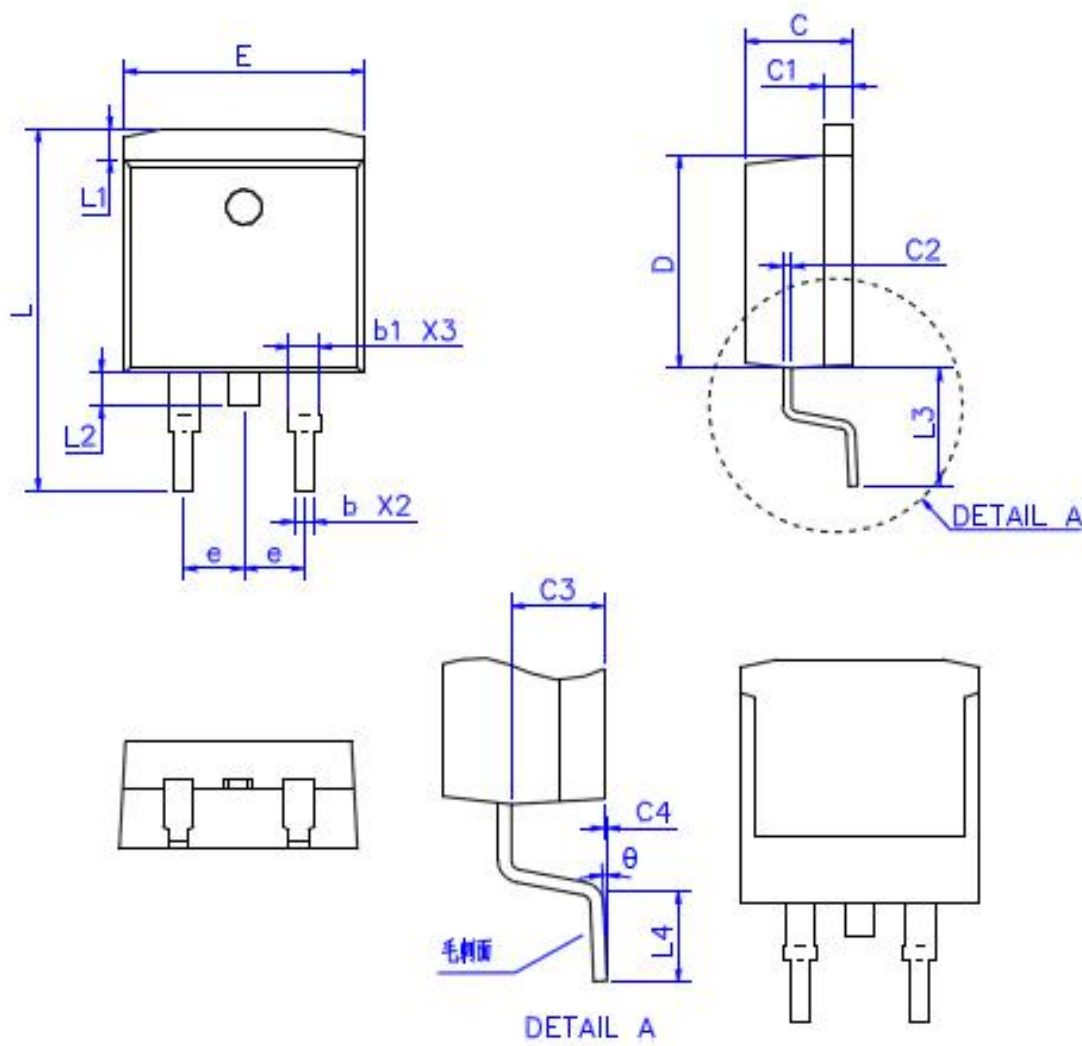
(Unit: mm)

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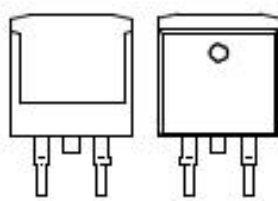
外形尺寸:

Package Dimension:

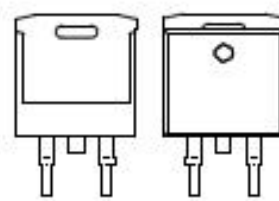
TO-263



DIM	MILLIMETERS	
	MIN	MAX
E	9.80	10.50
L	14.60	15.80
L1	1.00	1.55
L2	1.30	1.70
L3	4.50	5.50
L4	2.10	2.90
b	0.60	0.99
b1	1.00	1.50
C	4.30	4.80
C1	1.10	1.45
C2	0.25	0.52
C3	2.40	2.80
C4	0	0.25
D	8.50	9.50
θ	0°	8°
e	Typical	2.54



框架不带锁料孔



框架带锁料孔

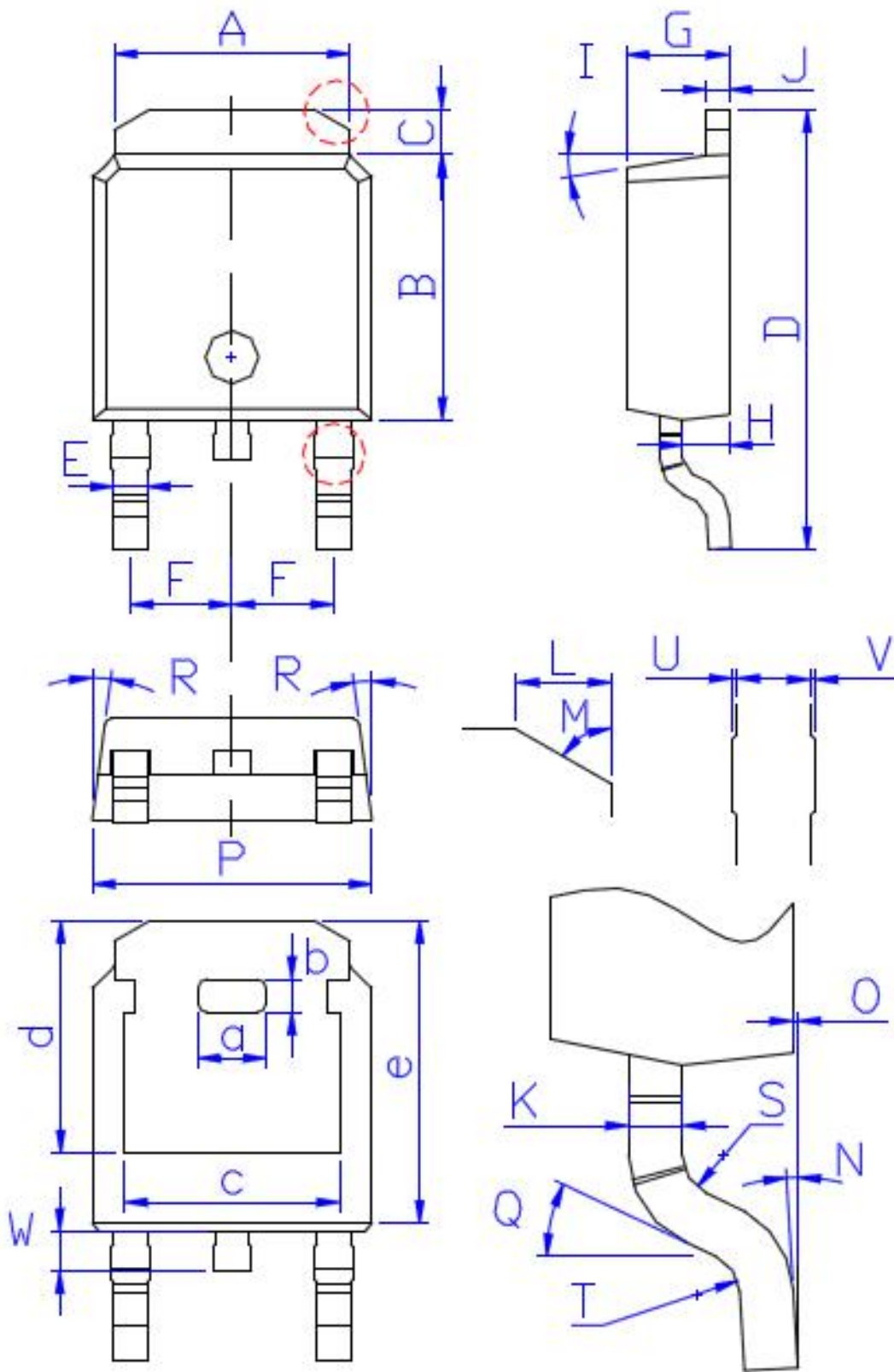
(Unit: mm)

N-CHANNEL MOSFET
RCP80N06A/RCS80N06A/RCD80N06A

外形尺寸:

Package Dimension:

TO-252



DIM	MILLIMETERS
A	5.34±0.30
B	6.00±0.30
C	1.05±0.30
D	9.95±0.30
E	0.76±0.15
F	2.28±0.15
G	2.30±0.30
H	1.06±0.30
I	(4-10)°
J	0.51±0.15
K	0.52±0.15
L	0.80±0.30
M	60°
N	(0-10)°
O	0.05±0.05
P	6.60±0.30
Q	25°
R	(4-8.5)°
S	R0.40
T	R0.40
U	0.05±0.05
V	0.05±0.05
W	0.90±0.30
a	1.80±0.30
b	0.75±0.30
c	4.85±0.30
d	5.30±0.30
e	6.90±0.30

(Units: mm)