

TDSEMIC

拓電半導體

自主封測 品質把控 售後保障

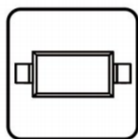
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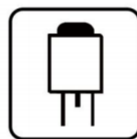
電源管理



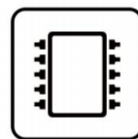
顯示驅動



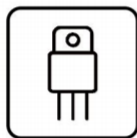
二三極管



LDO穩壓器



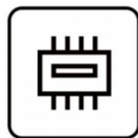
觸摸芯片



MOS管



運算放大器



存儲芯片



MCU



串口通信

TD80N07

產品規格說明書

N 沟道增强型场效应晶体管
N-CHANNEL MOSFET
TD80N07

主要参数 MAIN CHARACTERISTICS

ID	85A
VDSS	70V
Rdson-typ (@Vgs=10V)	7mΩ
Qg-typ	45nC

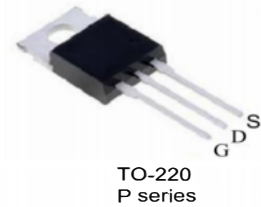
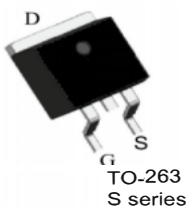
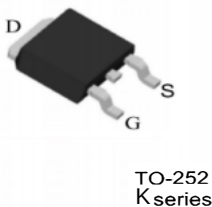
用途 APPLICATIONS

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

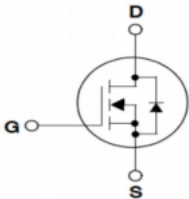
产品特性 FEATURES

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

封装形式 Package



等效电路 Equivalent Circuit



绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

项目 Parameter	符号 Symbol	数值 Value			单位 Unit
		TD80N07	TD80N07	TD80N07	
最高漏极-源极直流电压 Drain-Source Voltage	VDS	70			V
连续漏极电流* Drain Current -continuous *	ID (Tc=25℃)	85			A
	ID (Tc=100℃)	63			A
最大脉冲漏极电流 (注 1) Drain Current – pulse (note 1)	IDM	320			A
最高栅源电压 Gate-Source Voltage	VGS	±20			V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	EAS	50			mJ
雪崩电流 (注 1) Avalanche Current (note 1)	IAR	10			A
重复雪崩能量 (注 1) Repetitive Avalanche Current (note 1)	EAR	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	Pd (TC=25℃)	195	195	88	W
	-Derate above 25℃	0.6	0.6	0.7	W/℃
最高结温及存储温度 Operating and Storage Temperature Range	TJ, TSTG	-55~+150			℃
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	TL	300			℃

*漏极电流由最高结温限制
*Drain current limited by maximum junction temperature

电特性 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	BVDSS	Id=250μA, VGS=0V	70	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /Δ T _J	Id=250μA, referenced to 25℃	-	0.06	-	V/℃
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	IDSS	VDS=60V,VGS=0V, Tc=25℃	-	-	1	μA
		VDS=48V, Tc=125℃	-	-	100	μA
栅极体漏电流 Gate-body leakage current	IGSS (F/R)	VDS=0V, VGS =±20V	-	-	±100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	VGS(th)	VDS = VGS , Id=250μA	1.3	1.6	2.3	V
静态导通电阻 Static Drain-Source On-Resistance	RDS(ON)	VGS =10V , Id=30A	-	6.4	9	mΩ
		VGS =4.5V , Id=25A		9.5	11	
正向跨导 Forward Transconductance	gfs	VDS = 5V, Id=30A (note 4)	-	65	-	S
动态特性 Dynamic Characteristics						
栅电阻 Gate Resistance	Rg	f=1.0MHz, VDS OPEN	-	1.1	-	Ω
输入电容 Input capacitance	Ciss	VDS=30V, VGS =0V, f=1.0MHz	-	1940	-	pF
输出电容 Output capacitance	Coss		-	197	-	
反向传输电容 Reverse transfer capacitance	Crss		-	142	-	
开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	td(on)	VDD=30V, Id=30A, RG=2.7Ω VGS =10V (note 4, 5)	-	10	-	ns
上升时间 Turn-On rise time	tr		-	50	-	ns
延迟时间 Turn-Off delay time	td(off)		-	30	-	ns
下降时间 Turn-Off Fall time	tf		-	72	-	ns
栅极电荷总量 Total Gate Charge	Qg	VDS =30V , Id=30A , VGS =10V (note 4, 5)	-	45	-	nC
栅—源电荷 Gate-Source charge	Qgs		-	9	-	nC
栅—漏电荷 Gate-Drain charge	Qgd		-	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		IS	-	-	85	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		ISM	-	-	320	A
正向压降 Drain-Source Diode Forward Voltage	VSD	VGS=0V, IS=30A	-	0.8	1.3	V
反向恢复时间 Reverse recovery time	trr	VGS=0V, IS=30A ,dIF/dt=100A/μs (note 4)	-	21	-	ns
反向恢复电荷 Reverse recovery charge	Qrr		-	17	-	nC

热特性 THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	TD80N07	TD80N07	TD80N07	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, I_{AS}=10A, V_{DD}=48V, R_G=25 Ω, 起始结温 T_J=25°C
- 3: I_{SD} ≤80A, di/dt ≤300A/μs, V_{DD}≤B_VDSS, 起始结温 T_J=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, I_{AS}=10A, V_{DD}=48V, R_G=25 Ω, Starting T_J=25°C
- 3: I_{SD} ≤85A, di/dt ≤300A/μs, V_{DD}≤B_VDSS, Starting T_J=25°C
- 4: Pulse Test: Pulse Width ≤300μs, Duty Cycles≤2%
- 5: Essentially independent of operating temperatur

Typical Performance Characteristics

Fig 1: Output Characteristics

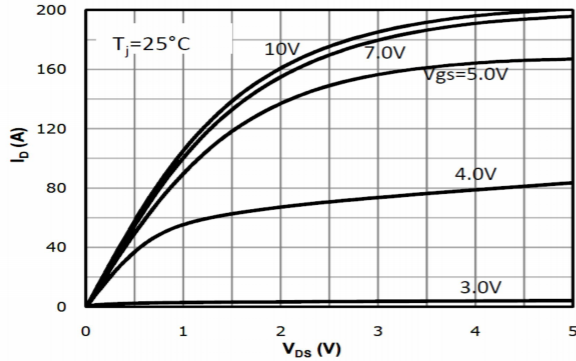


Fig 2: Transfer Characteristics

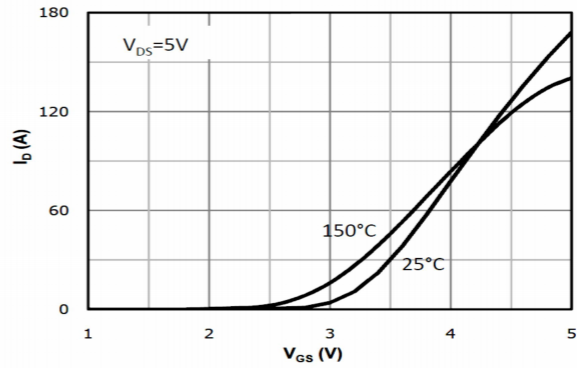


Fig 3: $R_{DS(on)}$ vs Drain Current and Gate Voltage

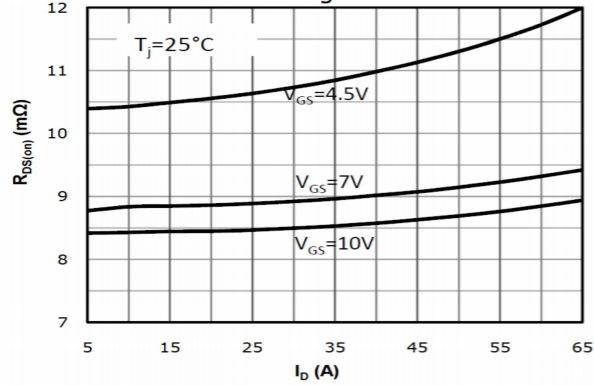


Fig 4: $R_{DS(on)}$ vs Gate Voltage

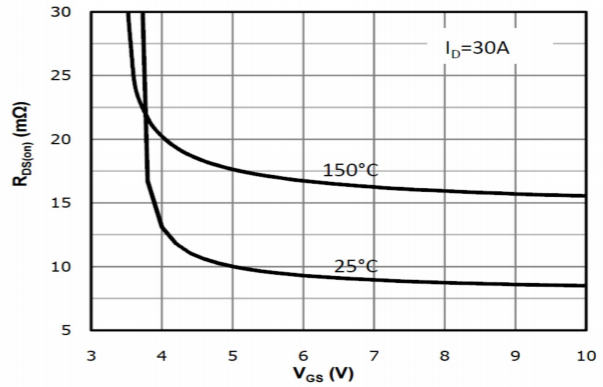


Fig 5: $R_{DS(on)}$ vs. Temperature

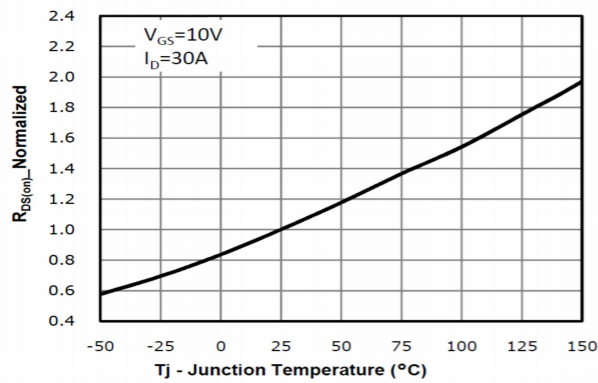


Fig 6: Capacitance Characteristics

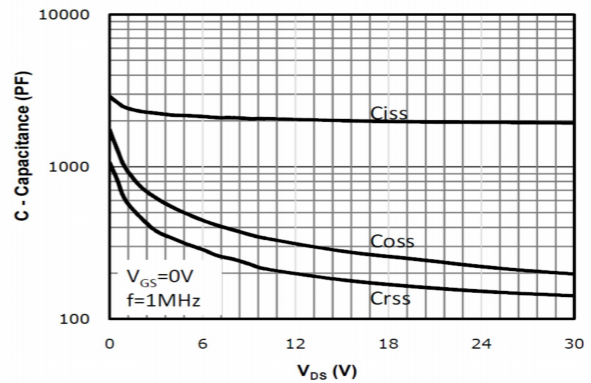


Fig 7: Gate Charge Characteristics

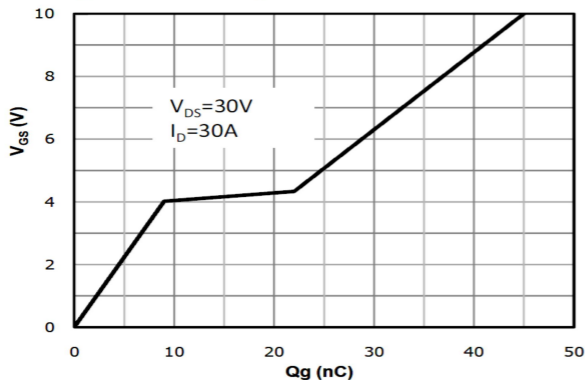


Fig 8: Body-diode Forward Characteristics

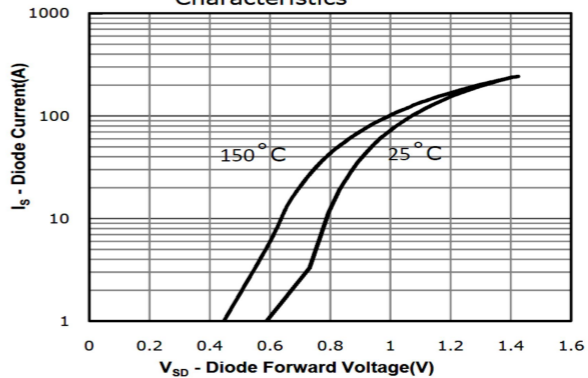


Fig 9: Power Dissipation

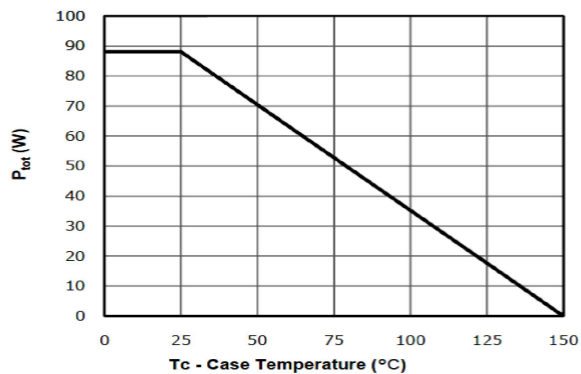


Fig 10: Drain Current Derating

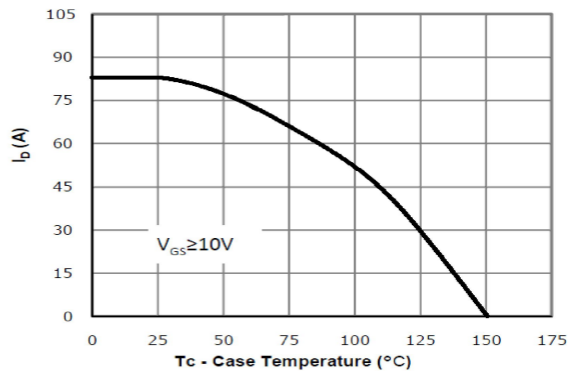


Fig 11: Safe Operating Area

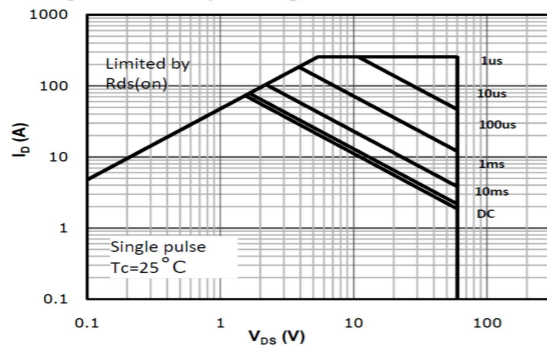
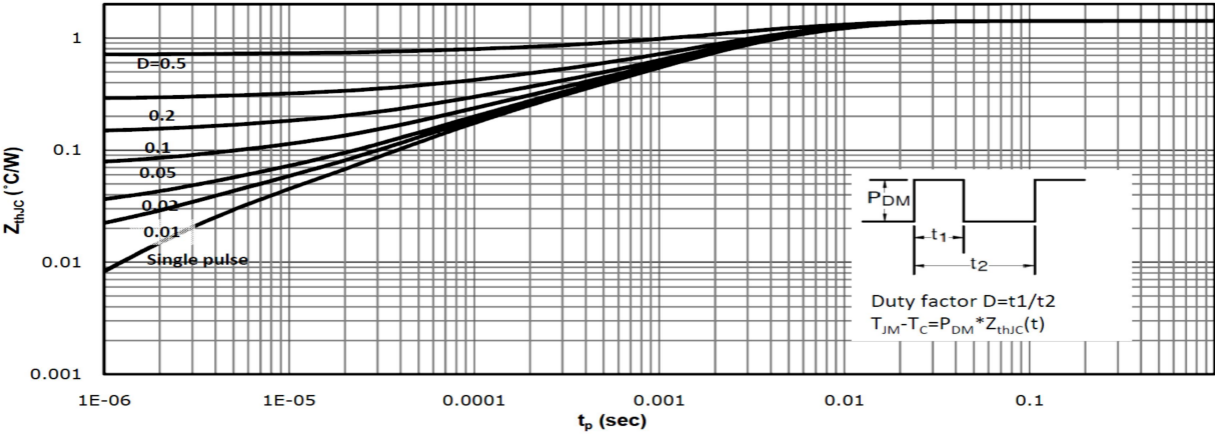
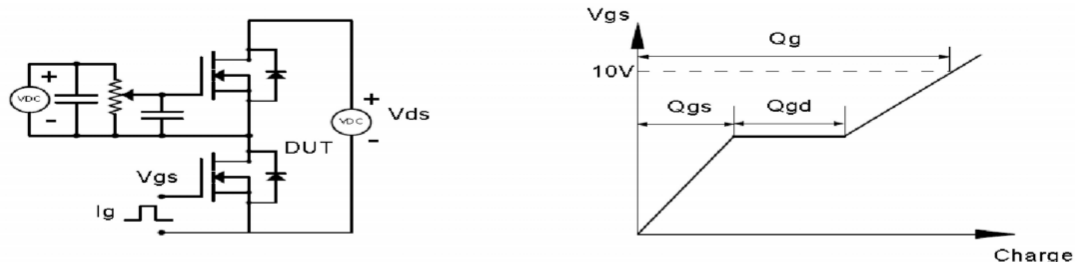


Fig 12: Max. Transient Thermal Impedance

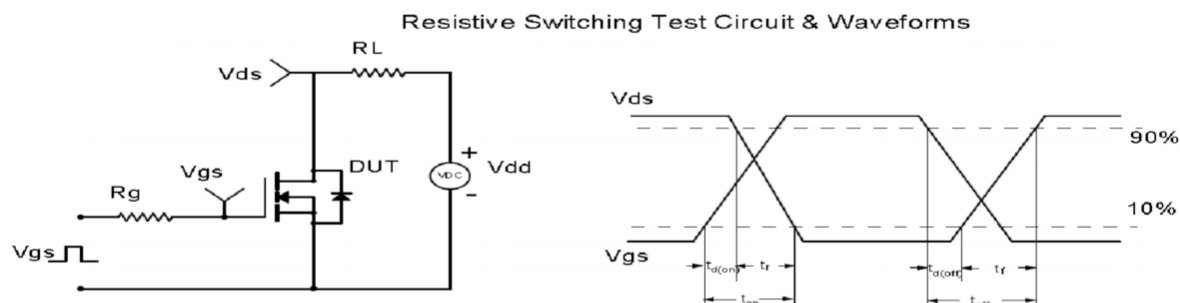


Test Circuit & Waveform

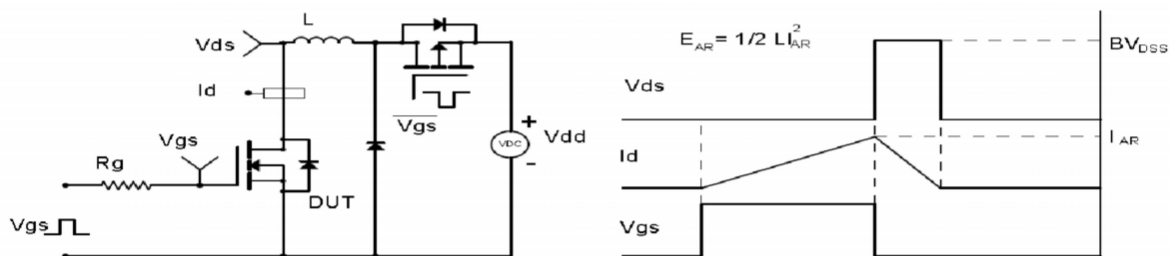
Gate Charge Test Circuit & Waveform



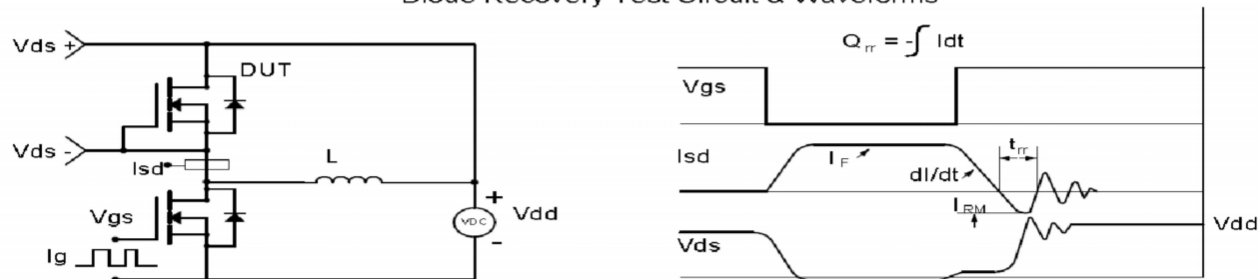
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



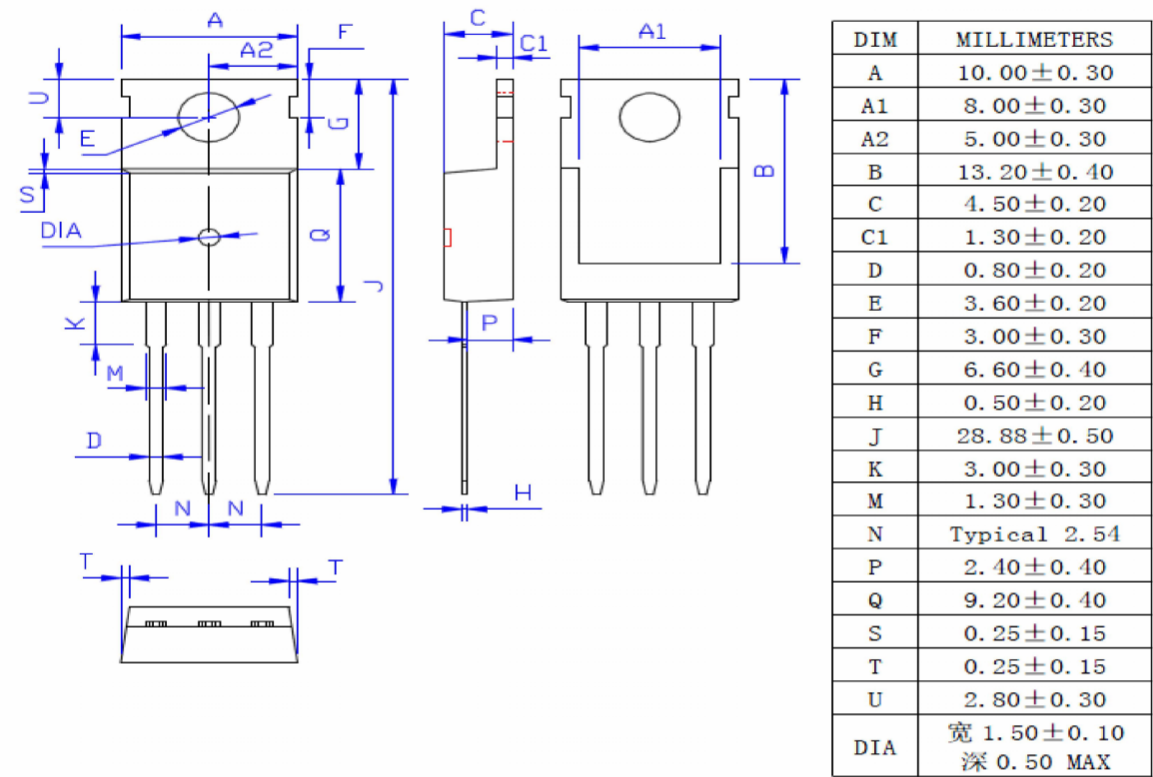
Diode Recovery Test Circuit & Waveforms



外形尺寸:

Package Dimension:

TO-220

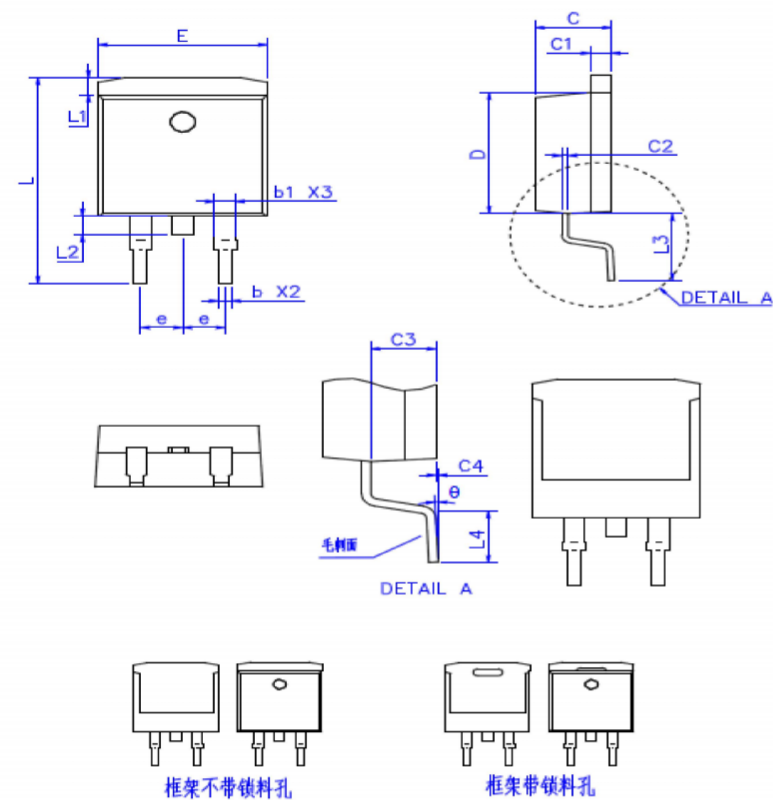


(Unit: mm)

外形尺寸:

Package Dimension:

TO-263



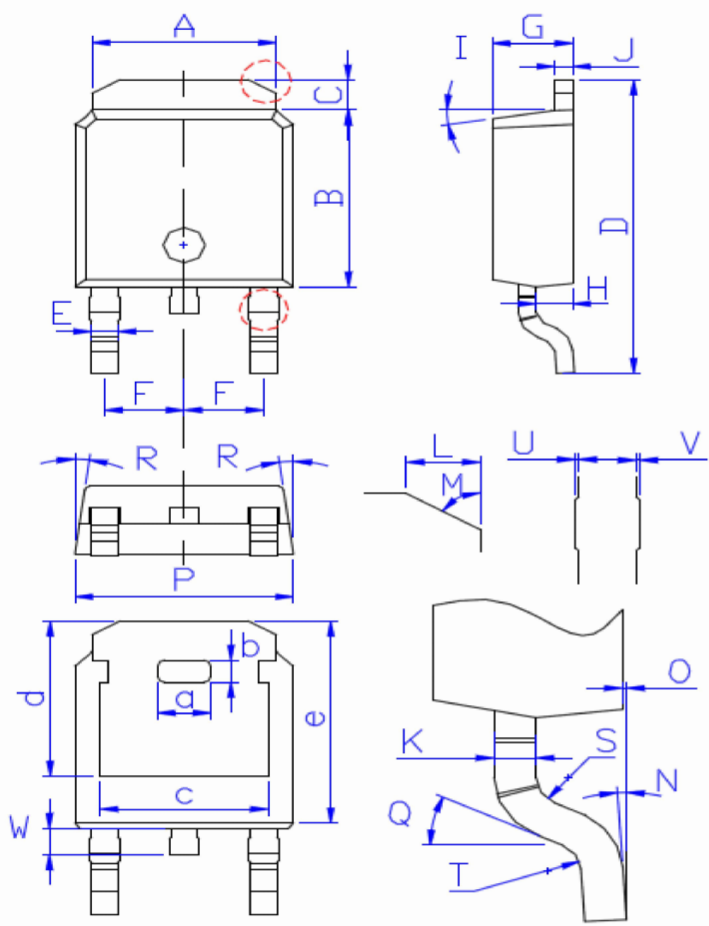
DIM	MILLIMETERS	
	MIN	MAX
E	9.80	10.50
L	14.60	15.80
L1	1.00	1.55
L2	1.30	1.70
L3	4.50	5.50
L4	2.10	2.90
b	0.60	0.99
b1	1.00	1.50
C	4.30	4.80
C1	1.10	1.45
C2	0.25	0.52
C3	2.40	2.80
C4	0	0.25
D	8.50	9.50
θ	0°	8°
e	Typical	2.54

(Unit: mm)

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)