RST048N10SM3、RST046N10SM2

N-MOSFET TO-220 100V, 130A, 4.2mΩ
TO-263 100V, 130A, 4mΩ

Features

- Uses advanced SGT technology
- Extremely low on-resistance RDS(on)
- Excellent gate charge x RDS(on) product(FOM)

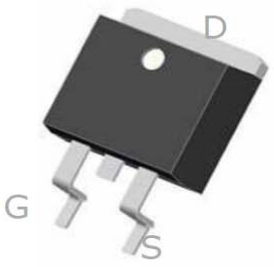
Application

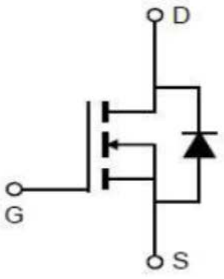
- Motor Drives
- SR (Synchronous rectification)
- DC/DC converter
- General purpose applications

Product Summary

	TO-220	TO-263
V_{DS}	100V	100V
$R_{DS(on)@VGS=10V}$	4.2mΩ	4mΩ
I_D	130A	130A







Package Marking and Ordering Information

Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
RST048N10SM3	TO-220	LR048N10SM3	-	-	Tube	50
RST046N10SM2	TO-263	LR046N10SM2	330*28.5mm	24mm	Reel&Tape	800

Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	100	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	130 85	A
Pulsed drain current T_C = 25°C, t_p limited by T_{jmax}	$I_{D\ pulse}$	480	
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω, V_{DS}=60V)	E_{AS}	625	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation T_C = 25°C	P_D	174	W
Operating junction and storage temperature	T_j , T_{stg}	-55~150	℃

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	0.72	℃/W
Thermal resistance, junction – ambient. Max	R_{thJA}	64	

Electrical Characteristic, at Tj = 25 °C, unless otherwise specified

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Static Characteristic						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250uA	100	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA T_j=25°C	2.0	3	4.0	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=100V,V_{GS}=0 V T_j=25°C	-	-	1	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=50A, T_j=25°C TO-220 TO-263	- -	4.2 4.0	4.8 4.6	mΩ
Transconductance	g_{fs}	V_{DS}=5V,I_D=50A	-	125	-	S
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=40V, f=1MHz	-	5377	-	pF
Output Capacitance	C_{oss}		-	3855	-	
Reverse Transfer Capacitance	C_{rss}		-	38	-	
Gate Total Charge	Q_G	V_{GS}=10V, V_{DS}=45V, I_D=25A	-	55	-	nC
Gate-Source charge	Q_{gs}		-	15	-	
Gate-Drain charge	Q_{gd}		-	13	-	
Turn-on delay time	$t_{d(on)}$	T_j=25°C, V_{GS}=10V, V_{DS}=45V, R_L=3Ω	-	14	-	ns
Rise time	t_r		-	12	-	
Turn-off delay time	$t_{d(off)}$		-	32	-	
Fall time	t_f		-	11	-	
Gate resistance	R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	0.8	-	Ω

Body Diode Characteristic

Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=50A	-	-	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=20A, dI/dt=500A/μs	-	61	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=20A, dI/dt=500A/μs	-	550	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

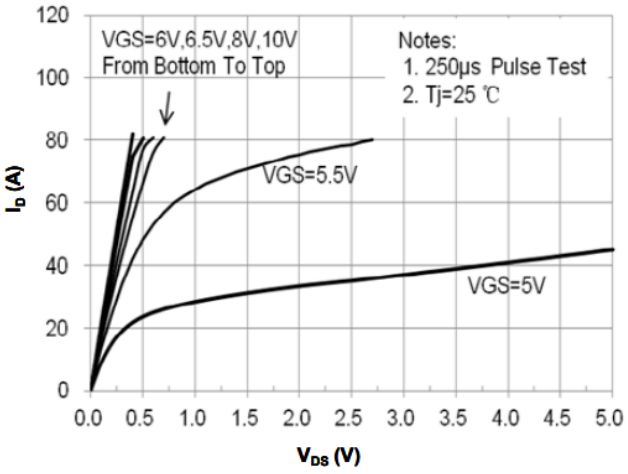


Fig 2: Transfer Characteristics

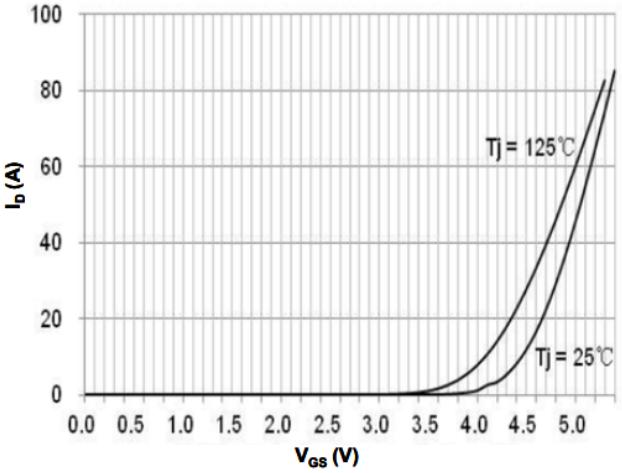


Fig 3: Rdson Vs Ids Characteristics(Tc=25℃)

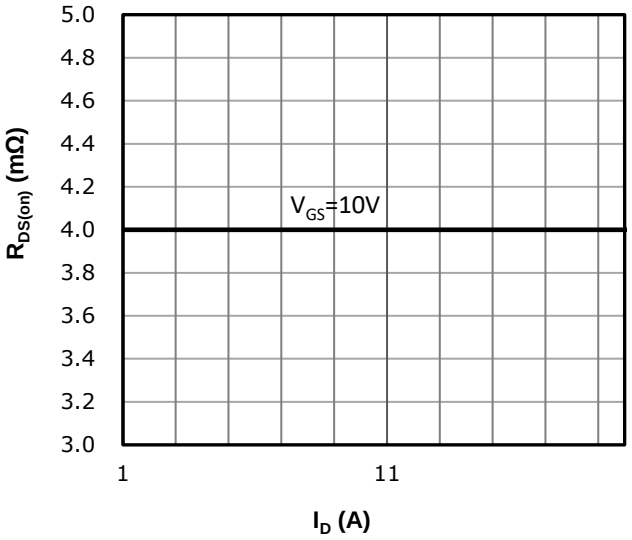


Fig 4: Rds(on) vs Gate Voltage

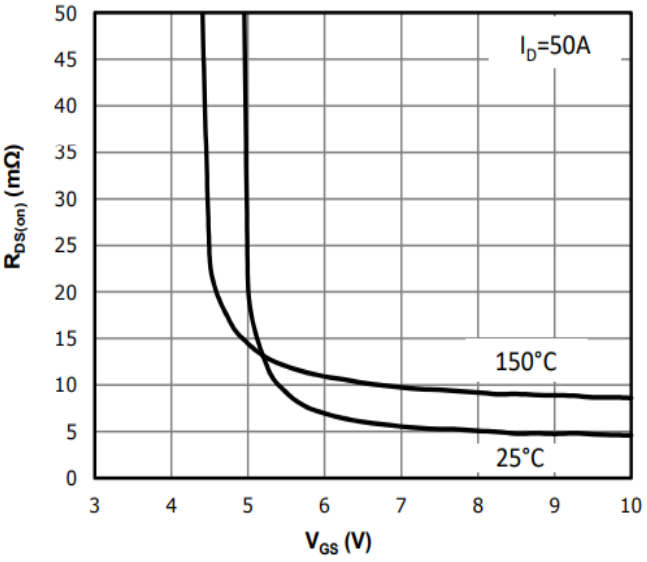


Fig 5: Rds(on) vs. Temperature

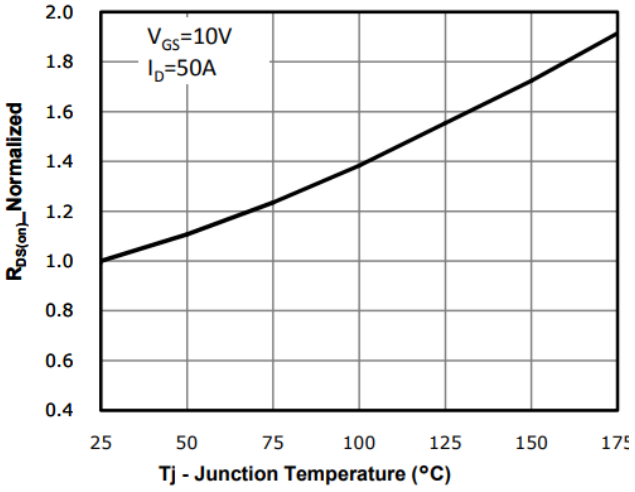


Fig 6: Capacitance Characteristics

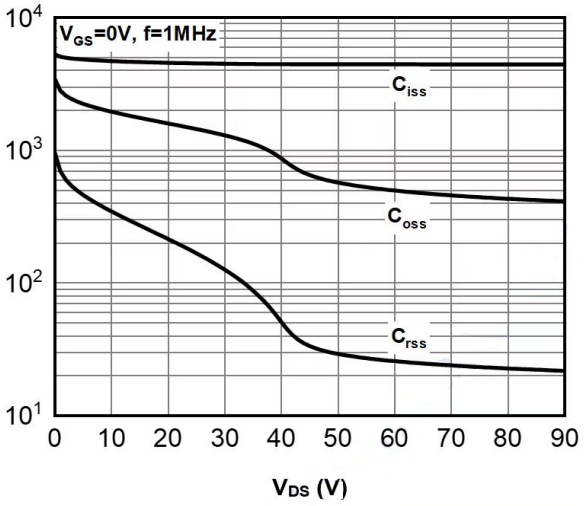


Fig 7: Gate Charge Characteristics

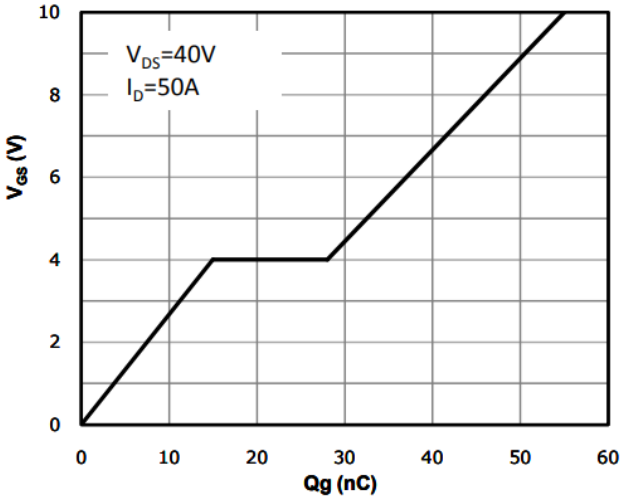


Fig 8: Body-diode Forward Characteristics

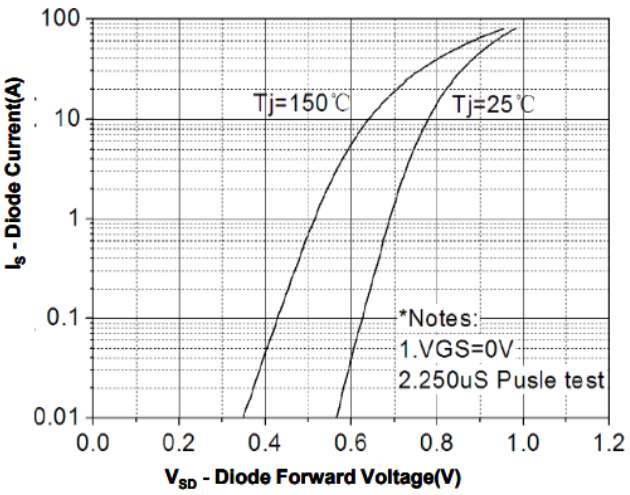


Fig 9 : Power Dissipation

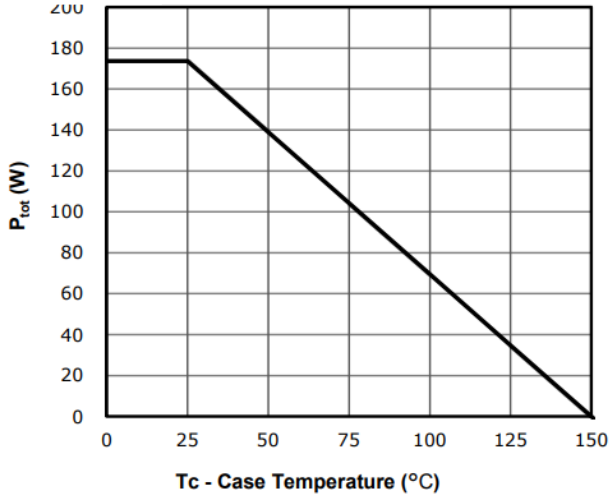


Fig 10 : Drain Current Derating

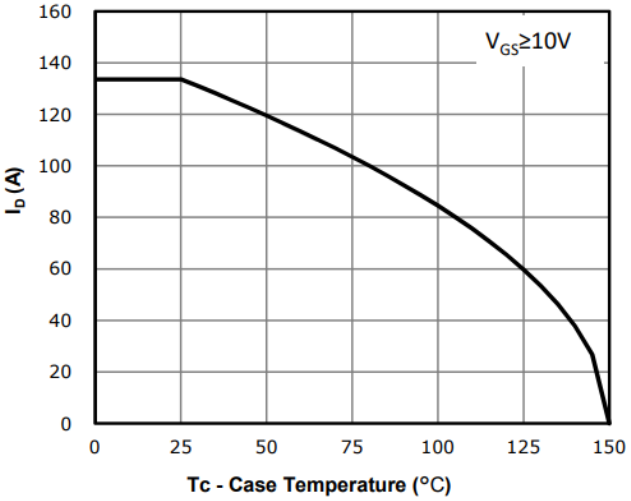


Fig 11: Safe Operating Area

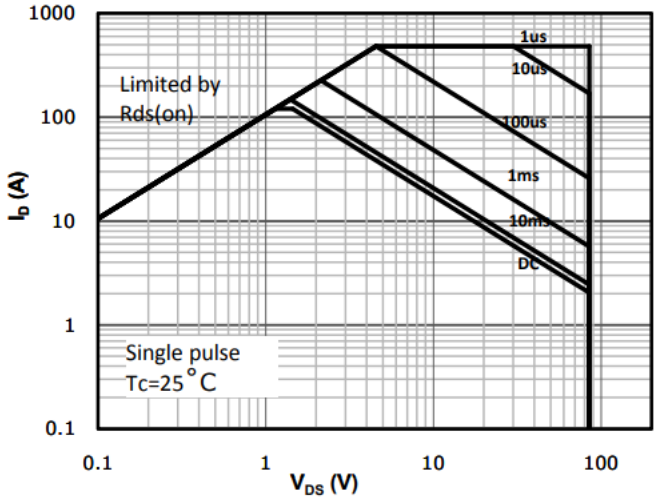
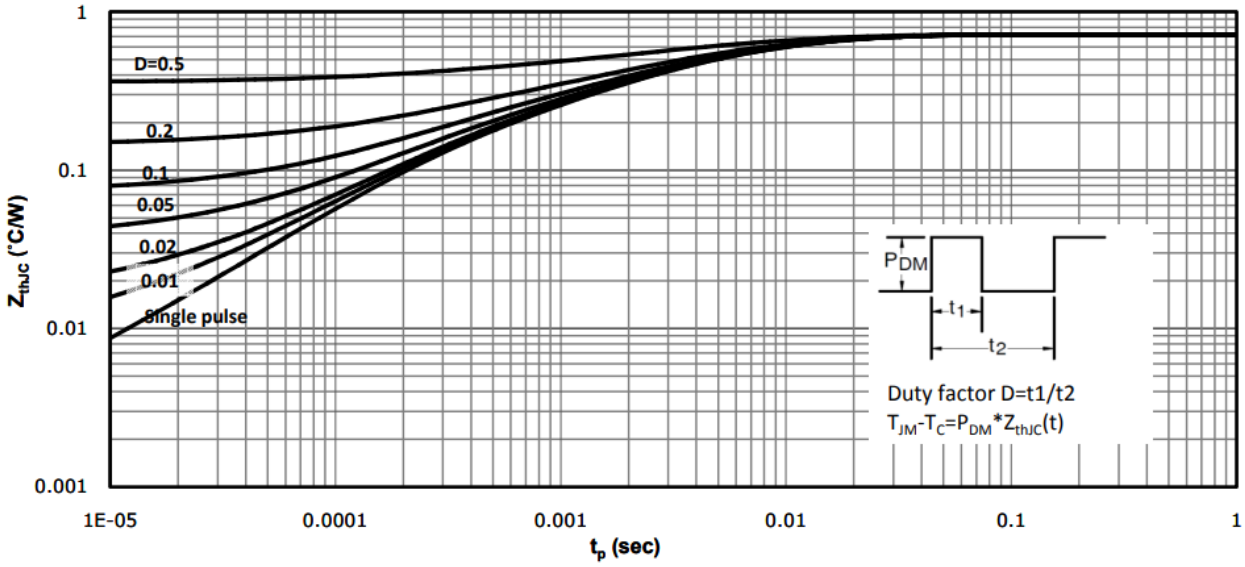
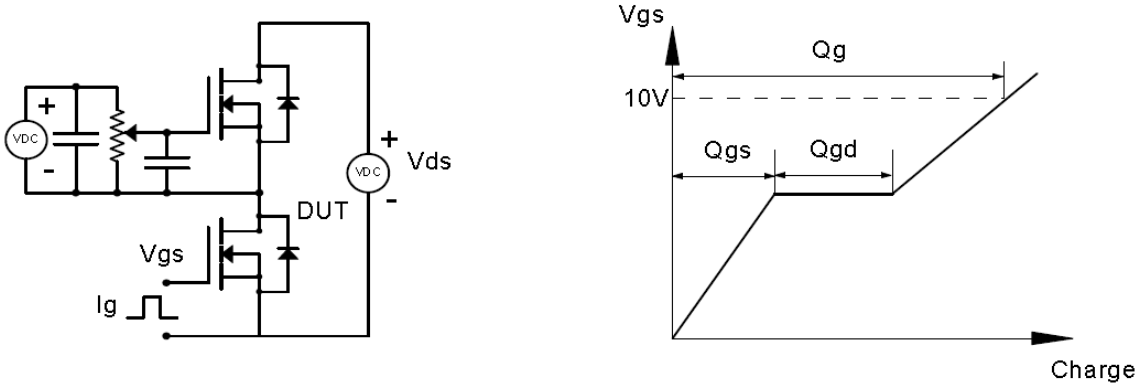


Fig 12: Max. Transient Thermal Impedance

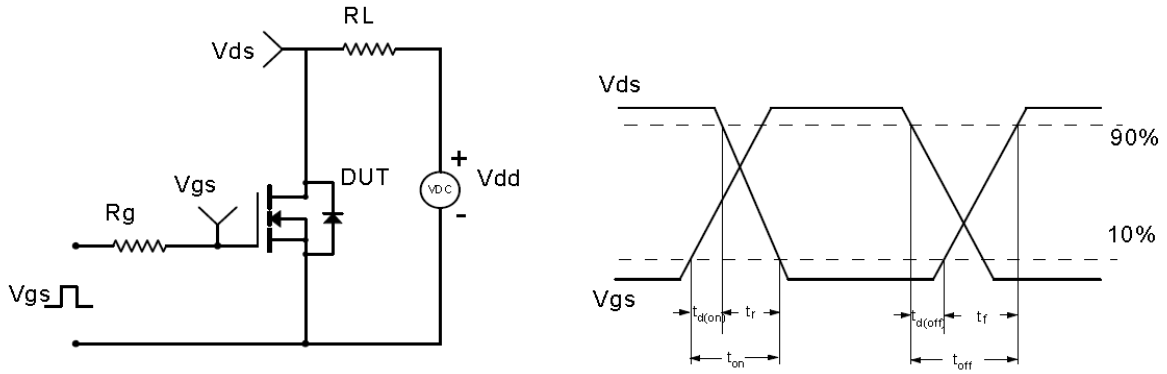


Test Circuit & Waveform

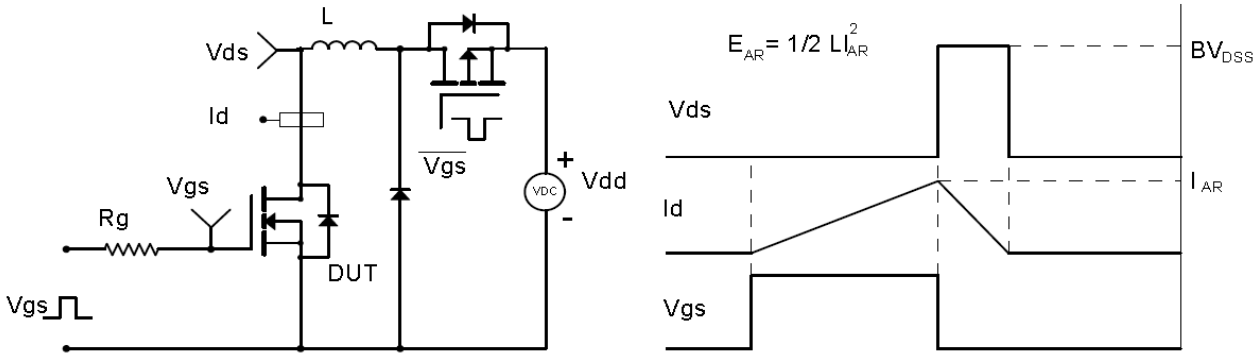
Gate Charge Test Circuit & Waveform



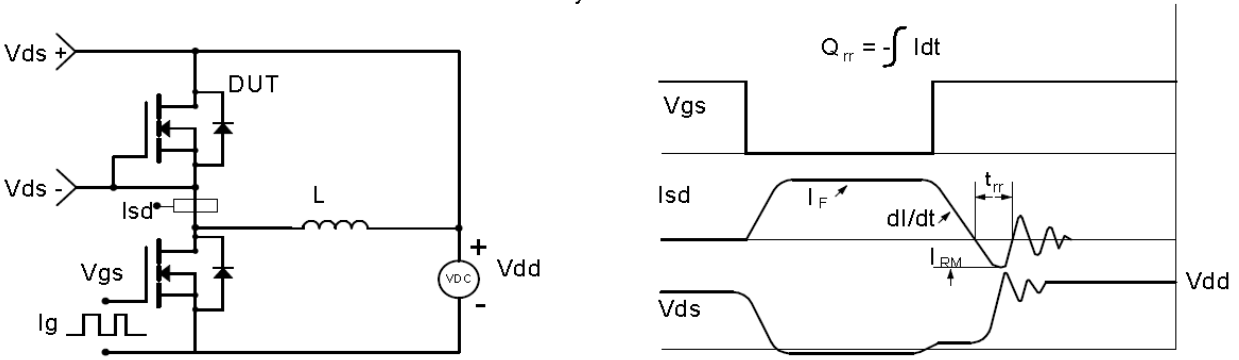
Resistive Switching Test Circuit & Waveforms



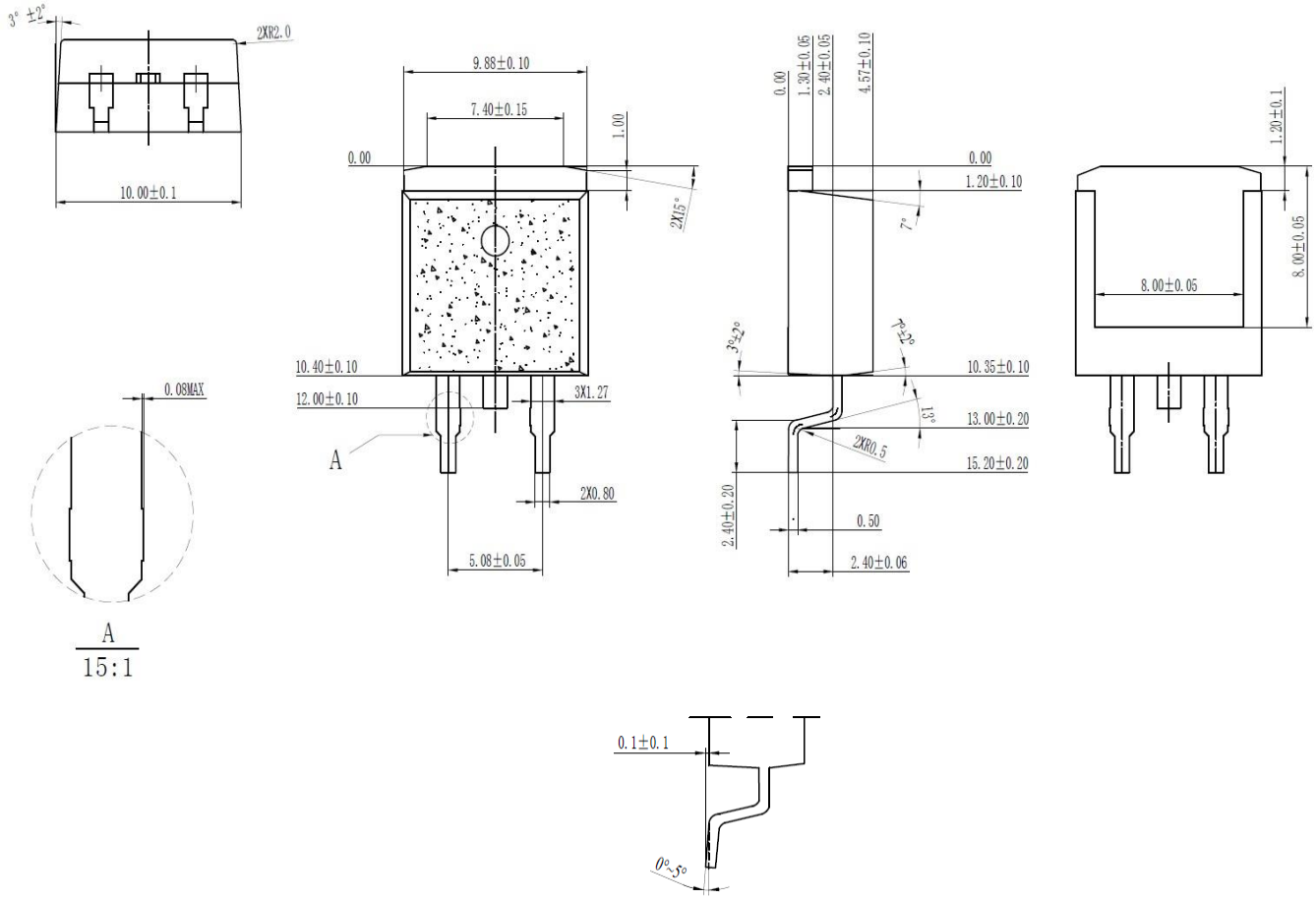
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



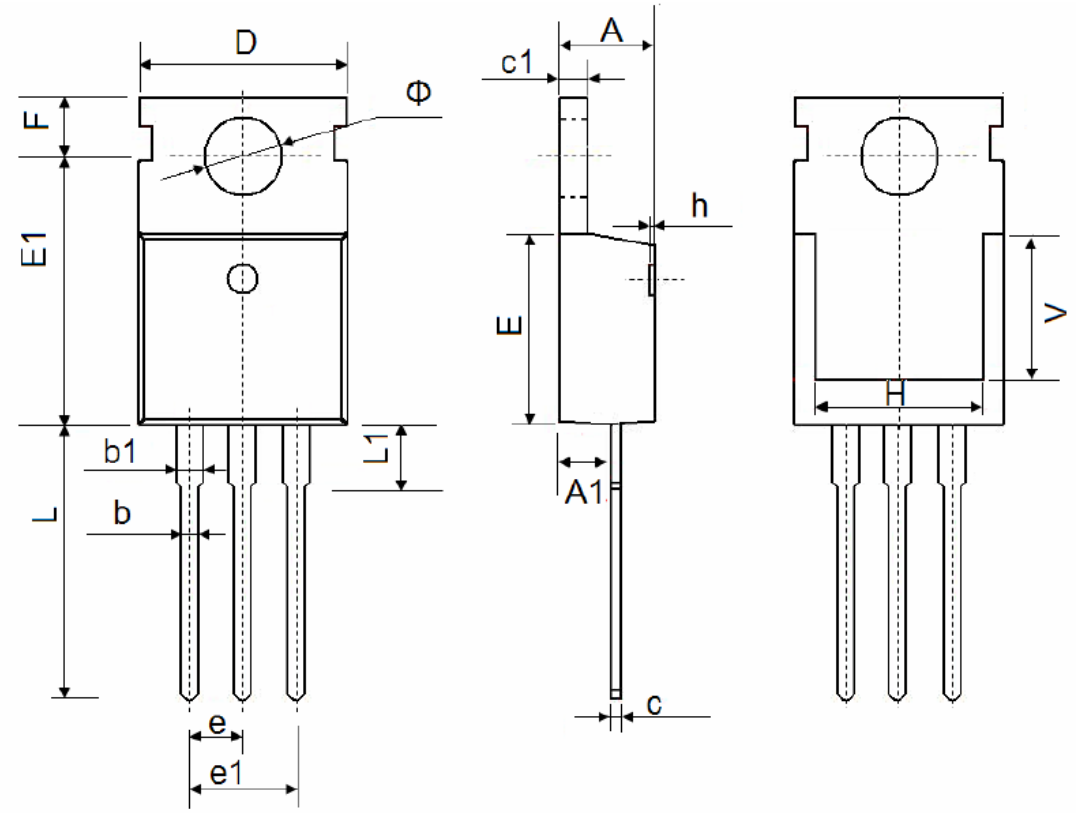
Package Outline: TO-263-2L



技术要求：

1. 塑封体中心与引线框架中心线偏差≤0.05，
   上下塑封体中心偏差≤0.05；
2. 塑封体不准有缺损、气泡、气孔、裂纹等缺陷；
3. 塑封体表面除阴影部分为毛面，其余为光面；
4. 未注脱模斜度≤5°；
5. 未注公差为±0.05，未注圆角为R0.15（max）。

Package Outline: TO-220-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 Typ.		0.100 Typ.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 Ref.		0.295 Ref.	
Φ	3.400	3.800	0.134	0.150