LR032N08S1

N-MOSFET TO-247 80V, 160A, 2.6mR

Features

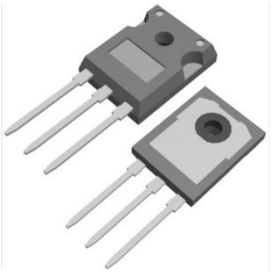
- Uses advanced SGT technology
- Extremely low on-resistance RDS(on)
- Excellent gate charge x RDS(on) product(FOM)

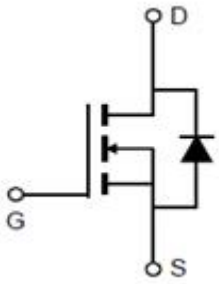
Application

- Motor control and drives
- Battery management
- DC/DC converter
- General purpose applications

Product Summary

	TO-247
V_{DS}	80V
$R_{DS(on)@VGS=10V}$	2.6mΩ
I_D	160A





Package Marking and Ordering Information

Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
LR032N08S1	TO-247	LR032N08S1	-	-	Tube	30

Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	80	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 25°C (Package limit) T_C = 100°C (Silicon limit)	I_D	 220 160 130	A
Pulsed drain current T_C = 25°C, t_p limited by T_{jmax}	$I_{D\ pulse}$	640	
Avalanche energy, single pulse (L=0.5mH,Rg=25Ω)	$E_{AS(max)}$	858	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation T_C = 25°C	P_D	284	W
Operating junction and storage temperature	T_j , T_{stg}	-55~150	℃

Preliminary

Thermal Resistance

	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	0.53	℃/W
Thermal resistance, junction – ambient. Max	R_{thJA}	48	

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	80	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA T_j=25°C	2	3	4	
Zero gate voltage drain current	I_{DSS}	V_{DS}=80V,V_{GS}=0V T_j=25°C	-	-	1	μA
		V_{DS}=64V,V_{GS}=0V T_j=125°C	-	-	10	
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	-	2.6	3.2	mΩ
Transconductance	g_{fs}	V_{DS}=5V,I_D=50A	170	-	-	S
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=50V, f=1MHz	-	6813	-	pF
Output Capacitance	C_{oss}		-	808	-	
Reverse Transfer Capacitance	C_{rss}		-	48	-	
Gate Total Charge	Q_G	V_{GS}=10V, V_{DS}=50V, I_D=50A	-	91	-	nC
Gate-Source charge	Q_{gs}		-	37	-	
Gate-Drain charge	Q_{gd}		-	25	-	
Turn-on delay time	$t_{d(on)}$	T_j=25°C, V_{GS}=10V, V_{DS}=50V, R_L=3Ω	-	38	-	ns
Rise time	t_r		-	58	-	
Turn-off delay time	$t_{d(off)}$		-	63	-	
Fall time	t_f		-	32	-	
Gate resistance	R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	2	-	Ω

Body Diode Characteristic

Body Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=50A	-	0.90	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=30A, dI/dt=500A/μs	-	45	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=30A, dI/dt=500A/μs	-	80	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

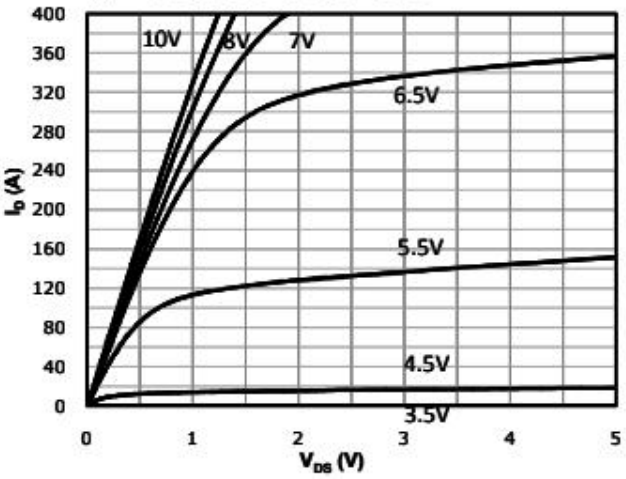
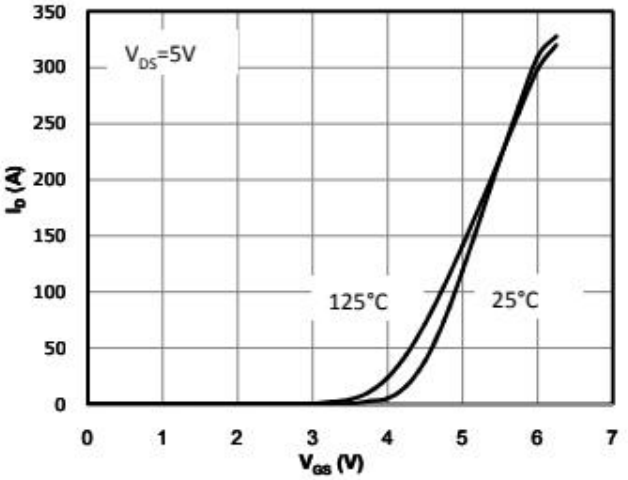


Fig 2: Transfer Characteristics



3: Rds(on) vs Drain Current and Gate Voltage

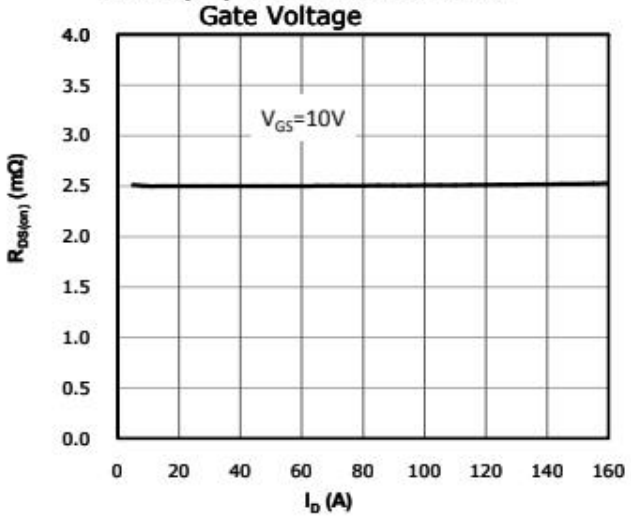


Fig 4: Rds(on) vs Gate Voltage

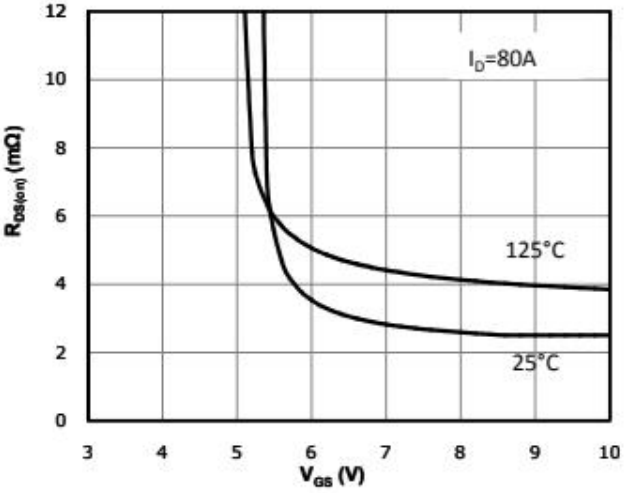


Fig 5: Rds(on) vs. Temperature

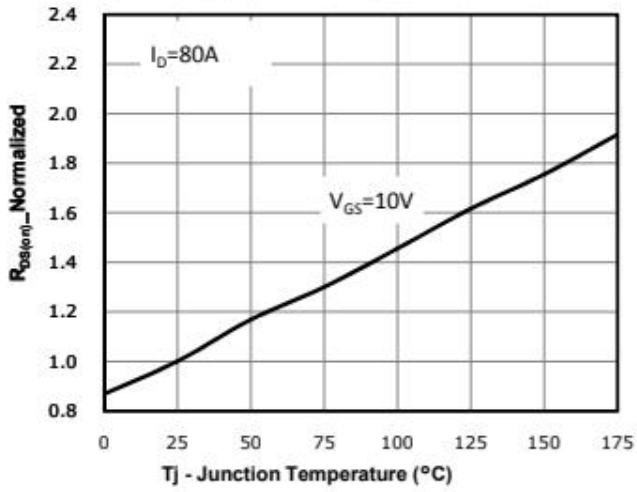


Fig 6: Capacitance Characteristics

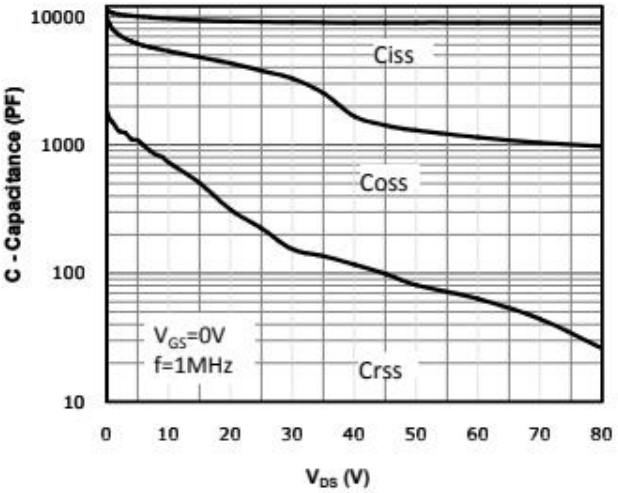


Fig 7: Gate Charge Characteristics

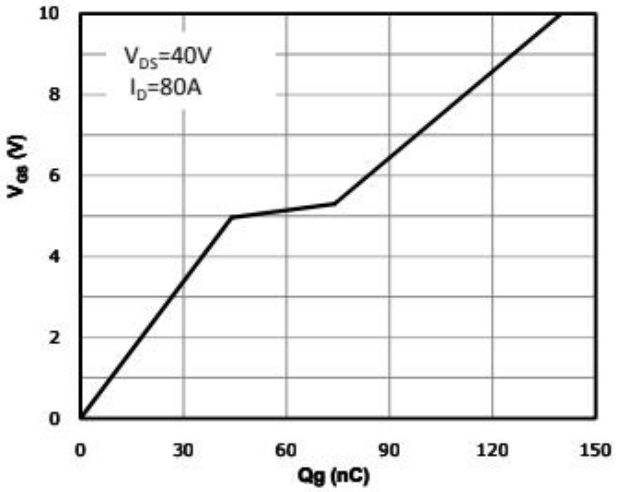


Fig 8: Body-diode Forward Characteristics

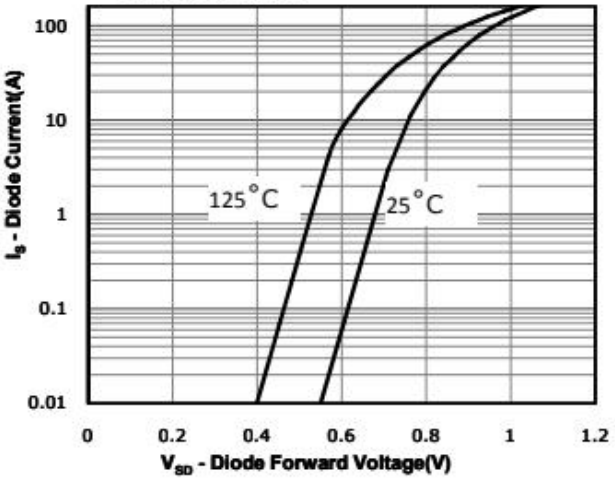


Fig 9: Power Dissipation

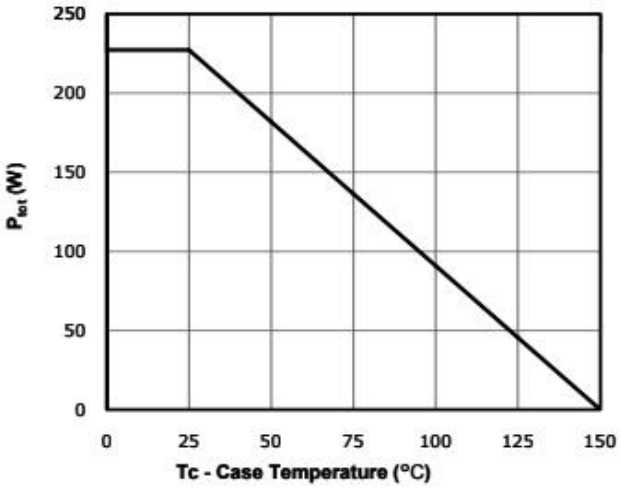


Fig 10: Drain Current Derating

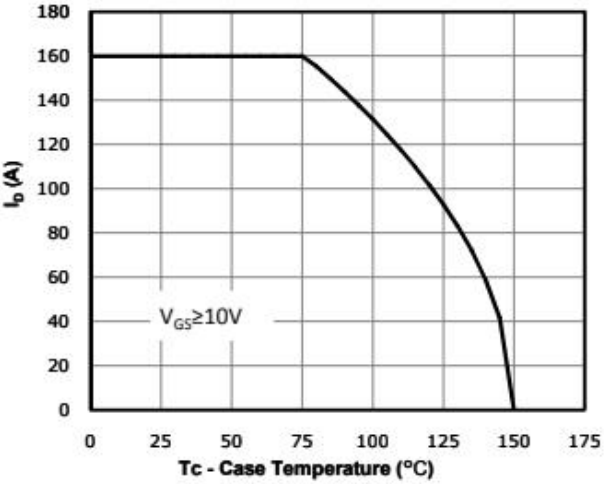


Fig 11: Safe Operating Area

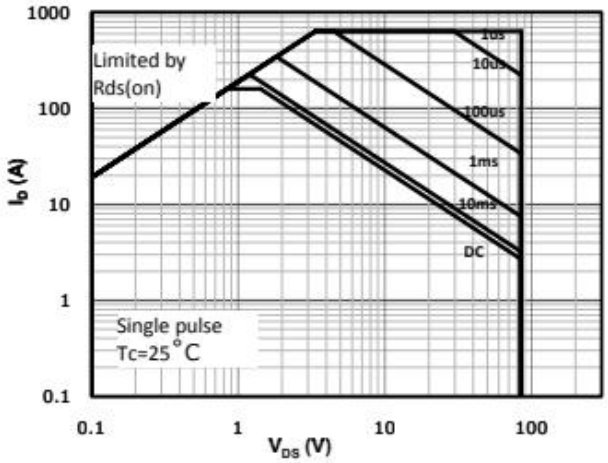
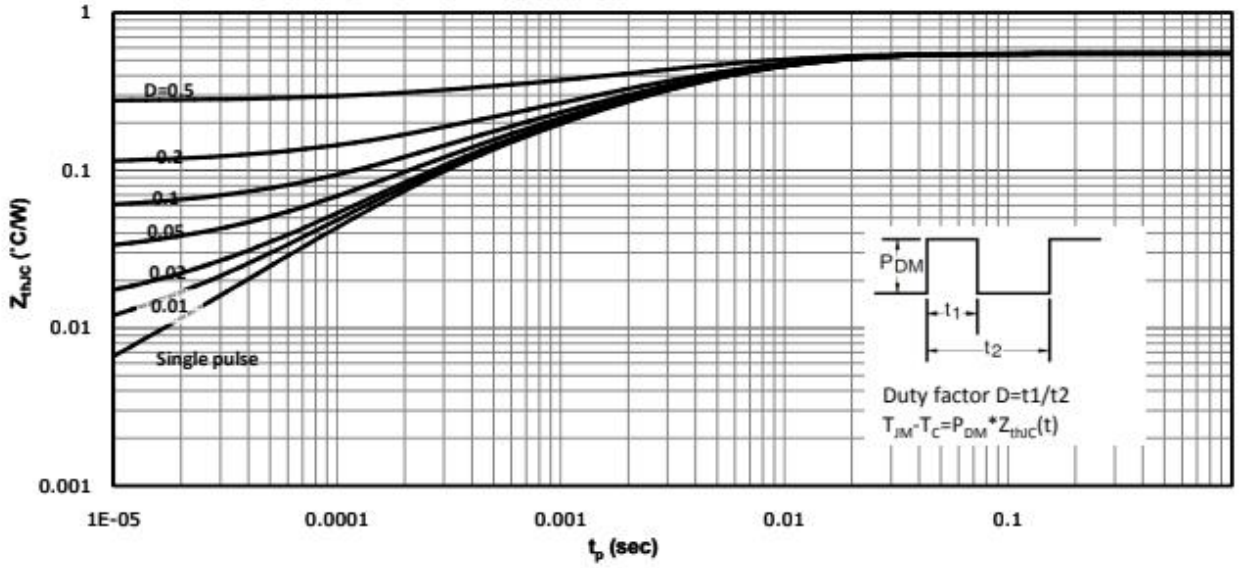
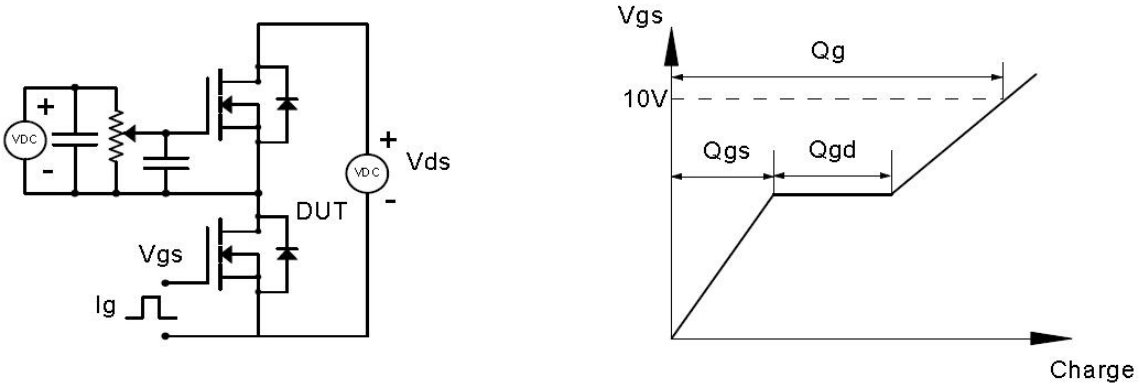


Fig 12: Max. Transient Thermal Impedance

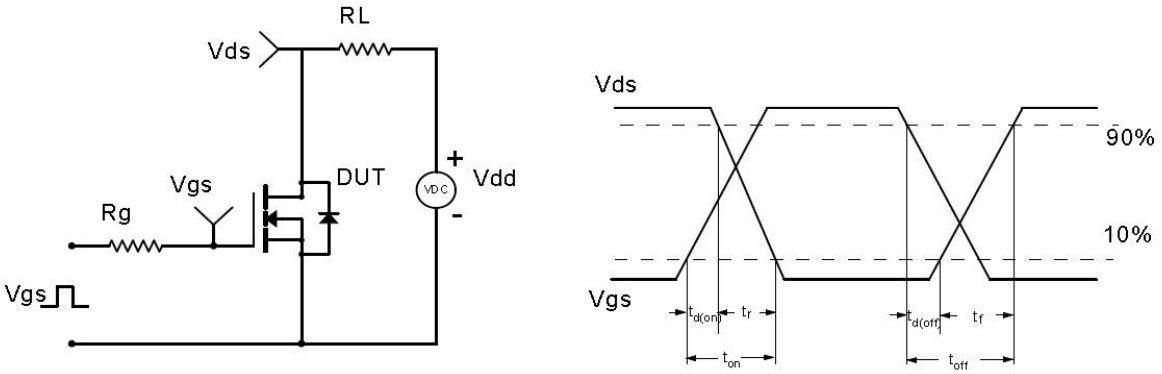


Test Circuit & Waveform

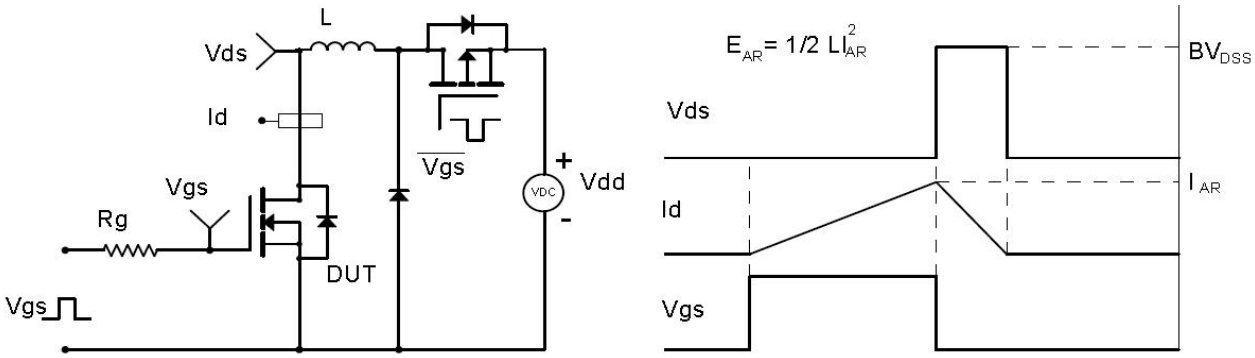
Gate Charge Test Circuit & Waveform



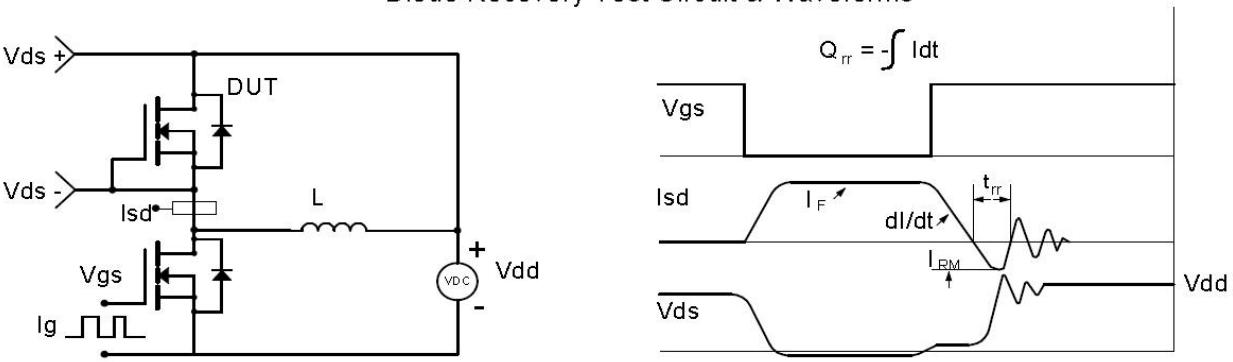
Resistive Switching Test Circuit & Waveforms



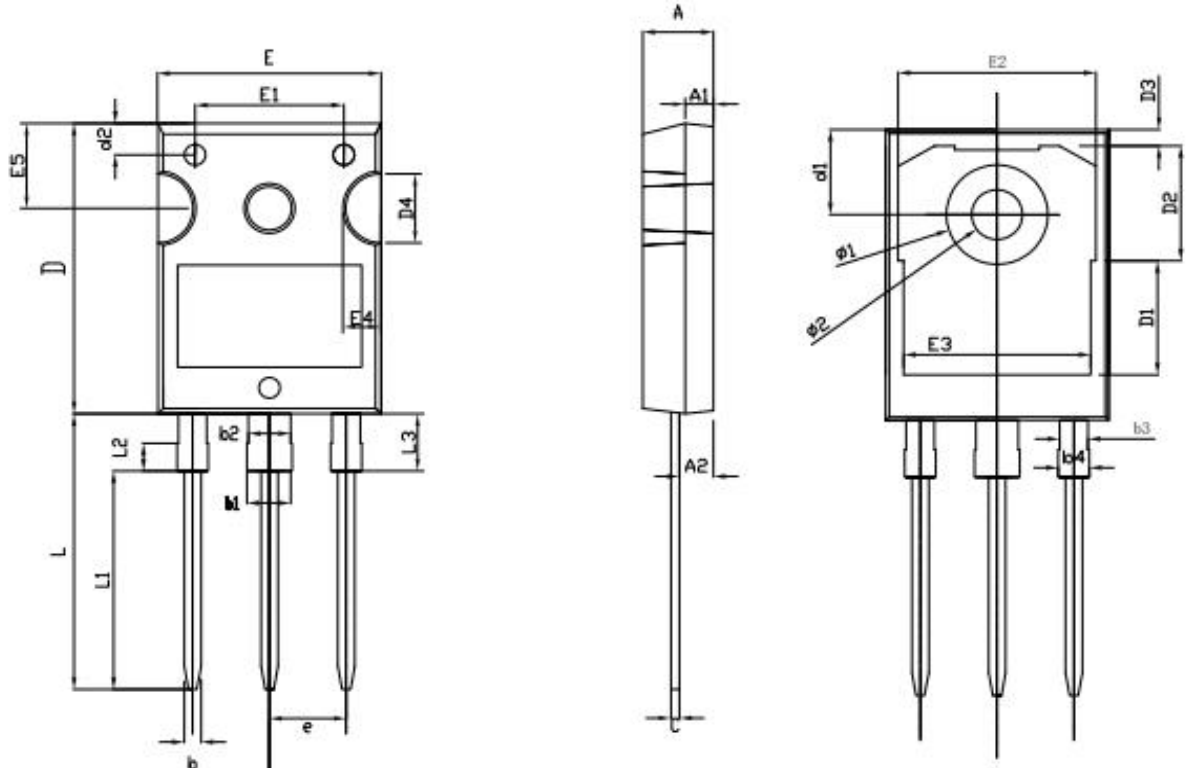
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

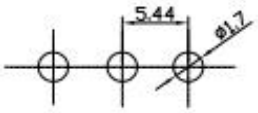


Package Outline: TO-247



	MIN	NOM	MAX
A	4.85	5.00	5.15
A1	1.90	2.00	2.10
A2	2.27	2.41	2.54
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	0.55	0.60	0.68
D	20.80	21.00	21.10
D1		8.23	
D2		8.32	
D3		1.17	
D4	3.68	4.90	5.10
d1	6.04	6.15	6.30
d2	2.20	2.30	2.40
E	15.70	15.80	16.00
E1		10.50	
E2		14.02	
E3		13.50	
E4	2.20	2.40	2.60
E5	5.49	5.80	6.00
e	5.34	5.44	5.54
L	19.72	19.92	20.12
L1		15.79	
L2		1.98	
L3	4.00	4.10	4.47
ø1	7.10	7.19	7.30
ø2	3.50	3.60	3.70

RECOMMENDED LAND PATTERN



UNIT: mm

Revision History

Revision	Date	Major changes
0.0	2021/6/24	Preliminary Revision
1.0	2021/12/24	Official version