LR072N15SW3

N-MOSFET TO-220 150V, 141A, 6.2mΩ

Features

- Uses advanced SGT technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)

Application

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

Product Summary

	TO-220	TO-263
V_{DS}	150V	150V
$R_{DS(on)@VGS=10V}$	6.2mΩ	6mΩ
I_D	141A	141A

Package Marking and Ordering Information

Type	Package	Marking	Reel Size	Tape Width	Packing	Qty
LR070N15SW2	TO-263	LR070N15SW2	330*28.5mm	24mm	Reel&Tape	800
LR072N15SW3	TO-220	LR072N15SW3	-	-	Tube	50

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	150	V
Continuous drain current T_C = 25°C (Package limit) T_C = 100°C (Silicon limit)	I_D	 141 89	A
Pulsed drain current T_C = 25°C, t_p limited by T_{jmax}	$I_{D\ pulse}$	564	
Avalanche energy, single pulse (L=0.5mH,Rg=25Ω)	E_{AS}	1156	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation T_C = 25°C	P_D	227	W
Operating junction and storage temperature	T_j , T_{stg}	-55~150	℃

Thermal Resistance

	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	0.31	℃/W
Thermal resistance, junction – ambient. Max	R_{thJA}	60	

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	150	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA T_j=25°C	2	3	4	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=150V,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=30A, T_j=25°C TO-220 TO-263	- -	6.2 6	7.2 7	mΩ
Transconductance	g_{fs}	V_{DS}=5V,I_D=30A	-	145	-	S
Dynamic Characteristic						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=75V, f=1MHz	-	5195	-	pF
Output Capacitance	C_{oss}		-	666	-	
Reverse Transfer Capacitance	C_{rss}		-	23	-	
Gate Total Charge	Q_G	V_{GS}=10V V_{DS}=75V I_D=50A	-	79	-	nC
Gate-Source charge	Q_{gs}		-	31	-	
Gate-Drain charge	Q_{gd}		-	17	-	
Turn-on delay time	$t_{d(on)}$	T_j=25°C, V_{GS}=10V, V_{DS}=40V, R_L=3Ω	-	18	-	ns
Rise time	t_r		-	100	-	
Turn-off delay time	$t_{d(off)}$		-	59	-	
Fall time	t_f		-	99	-	
Gate resistance	R_G	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	3.4	-	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=30A, dI/dt=500A/μs	-	122	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=60A, dI/dt=500A/μs	-	706	-	nC

Typical Performance Characteristics

Fig 1: Output Characteristics

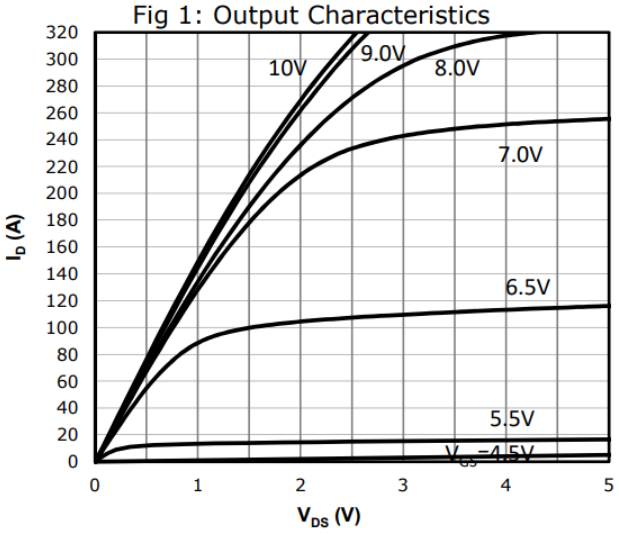


Fig 2: Transfer Characteristics

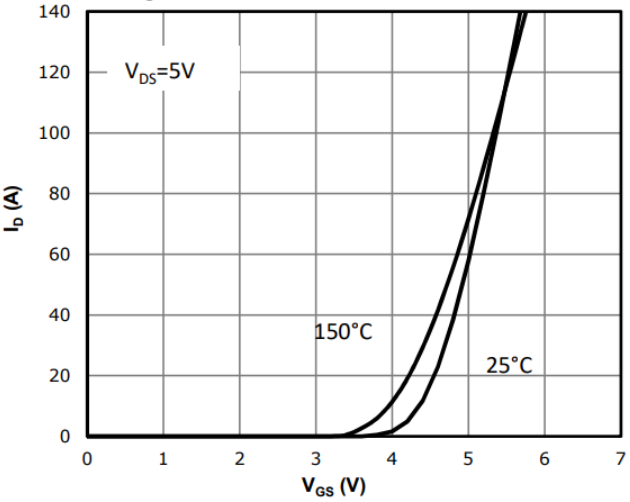


Fig 3: Rds(on) vs Drain Current and Gate Voltage

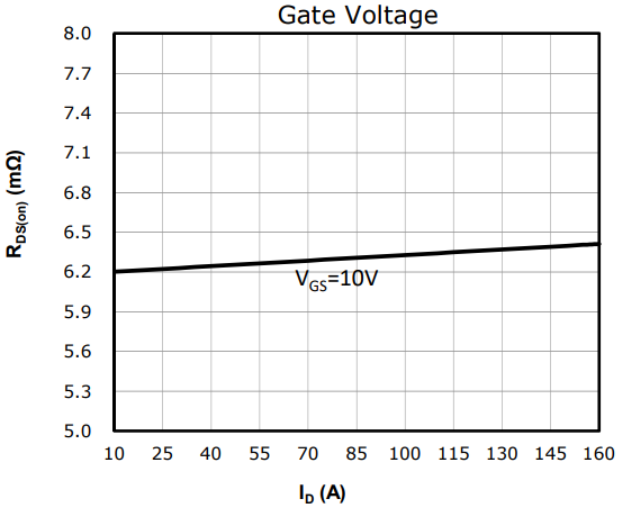


Fig 4: Rds(on) vs Gate Voltage

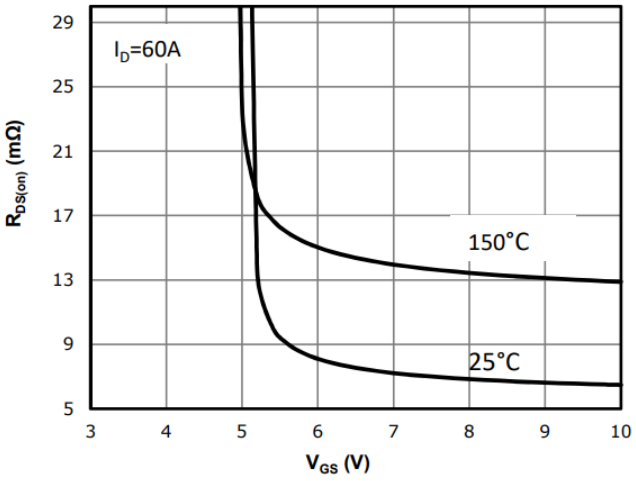


Fig 5: Rds(on) vs. Temperature

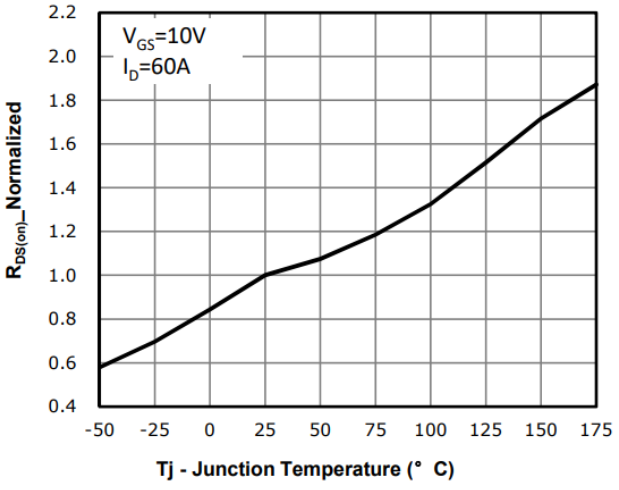


Fig 6: Capacitance Characteristics

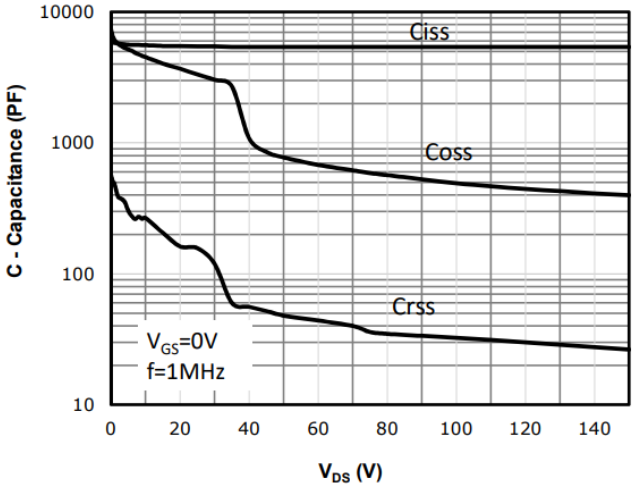


Fig 7: Vgs(th) vs. Temperature

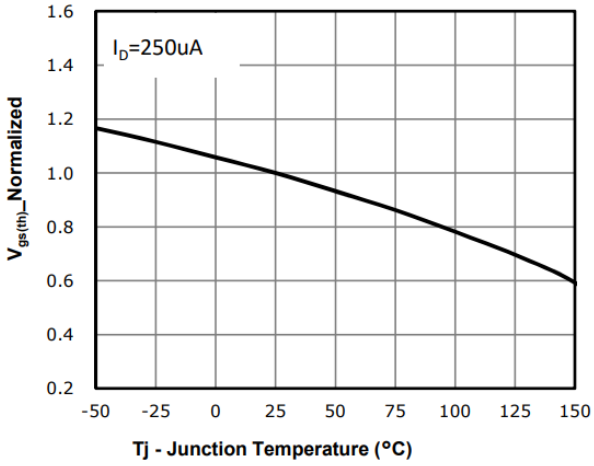


Fig 8: BVdss vs. Temperature

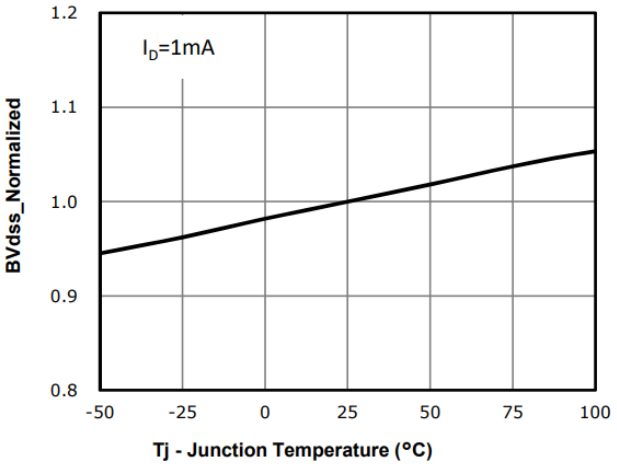


Fig 9: Gate Charge Characteristics

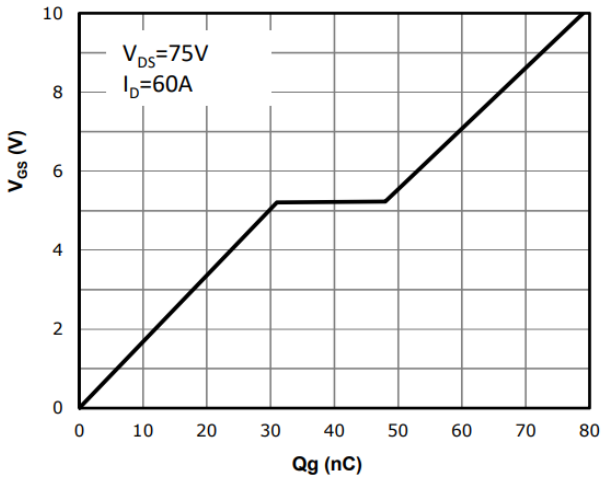


Fig 10: Body-diode Forward Characteristics

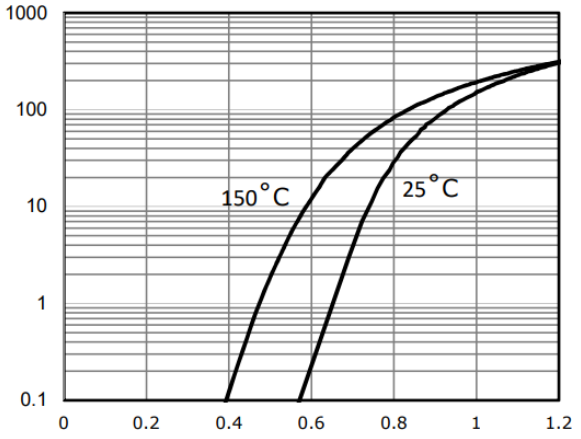


Fig 11: Power Dissipation

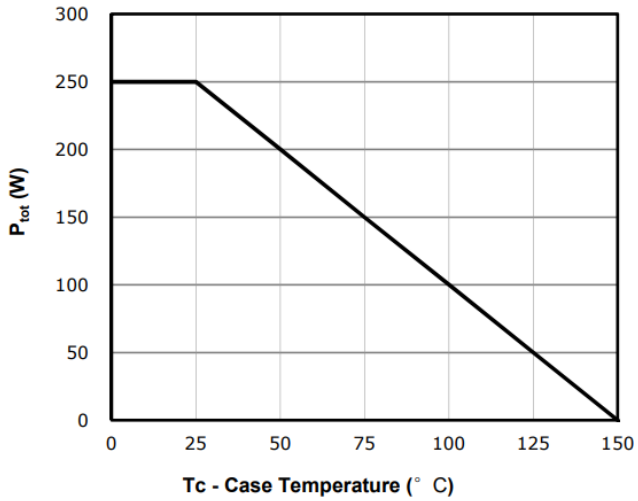


Fig 12: Drain Current Derating

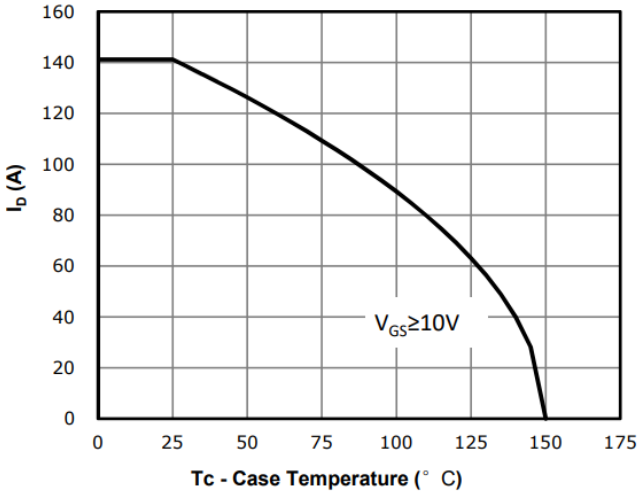


Fig 13: Safe Operating Area

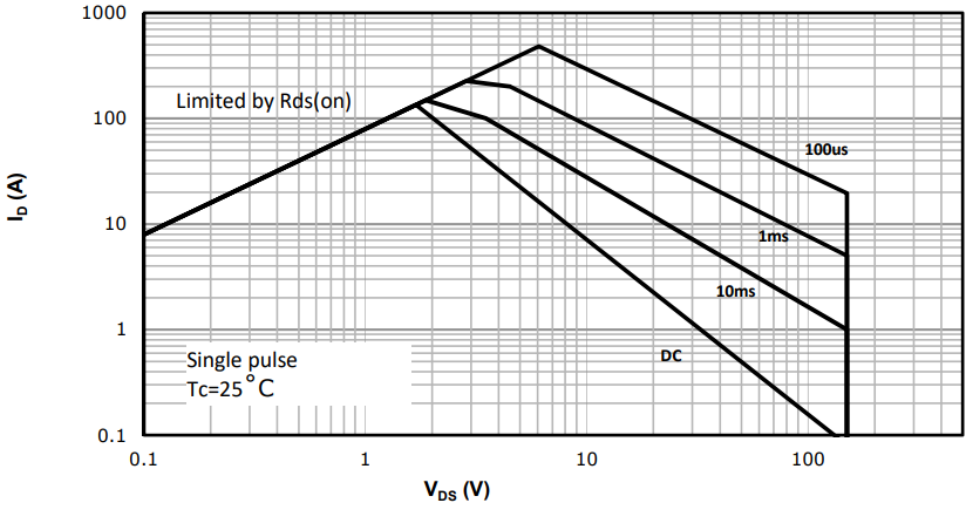
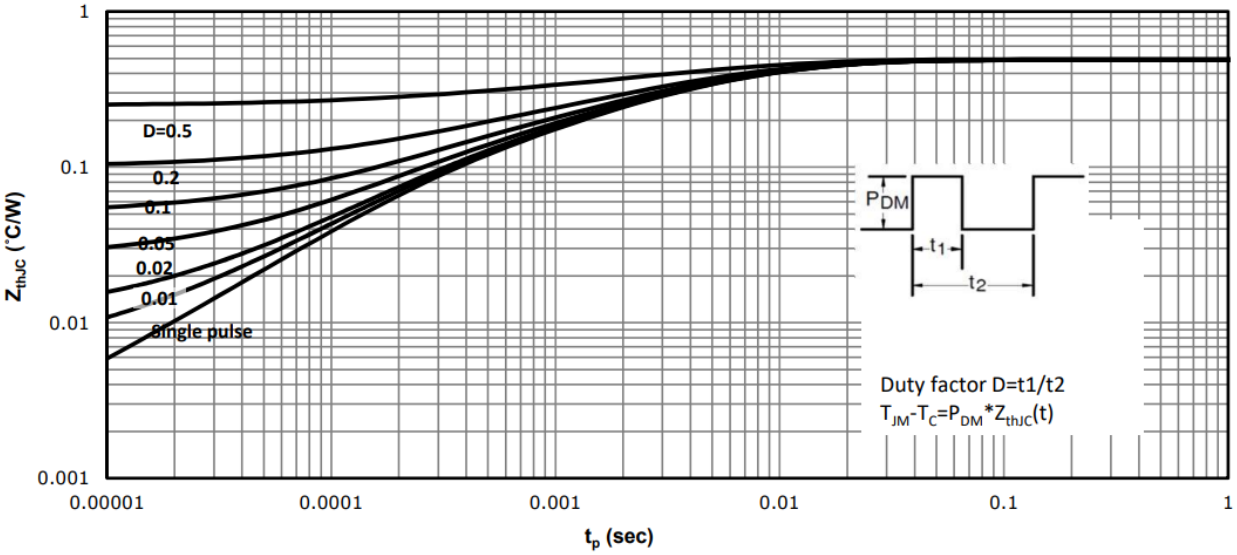
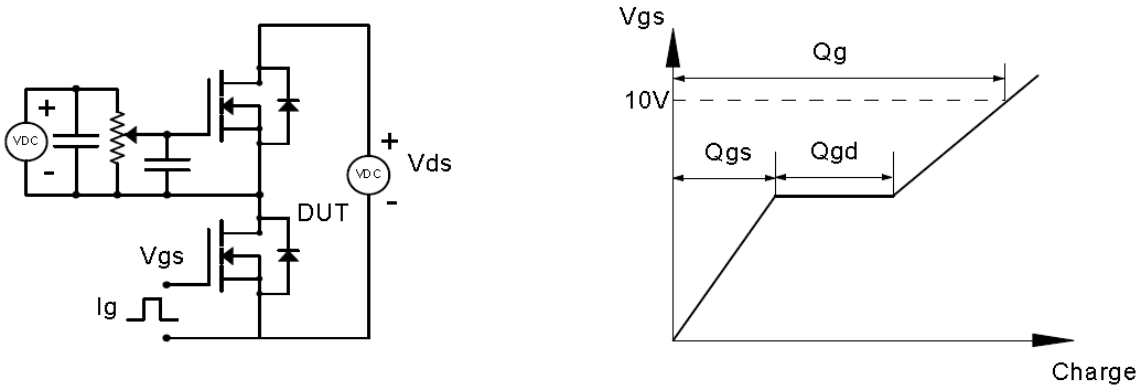


Fig 12: Max. Transient Thermal Impedance

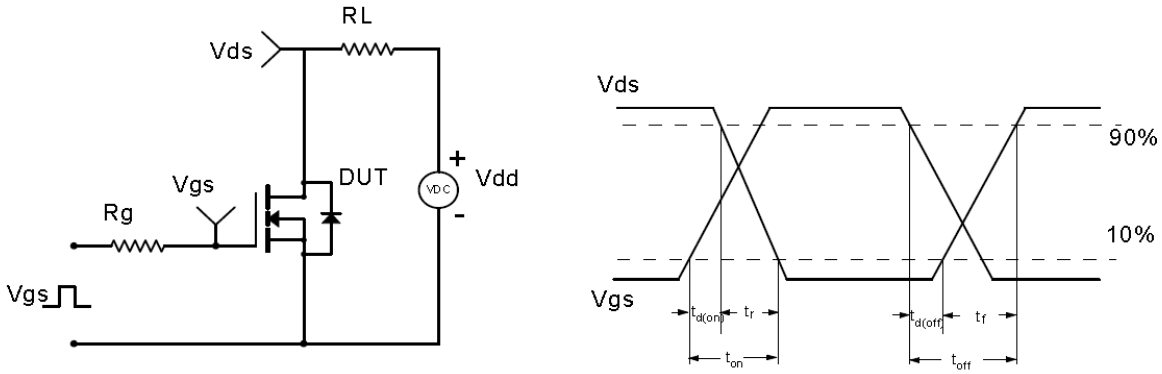


Test Circuit & Waveform

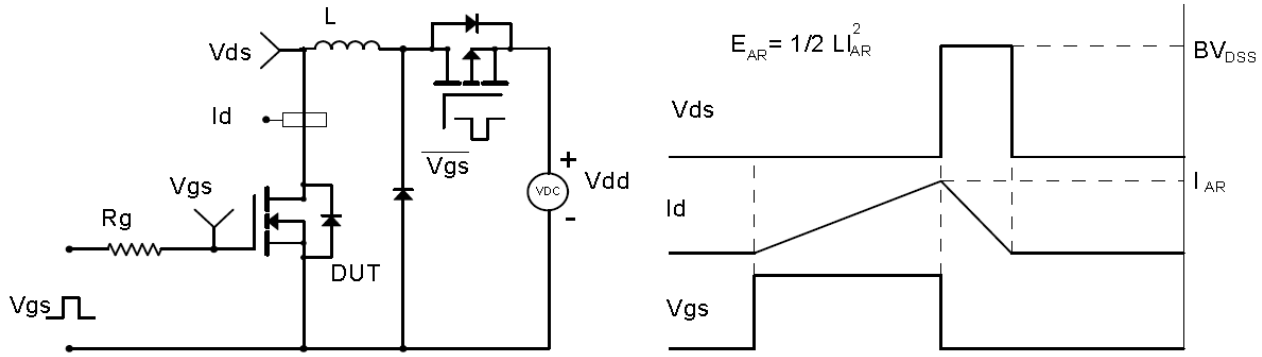
Gate Charge Test Circuit & Waveform



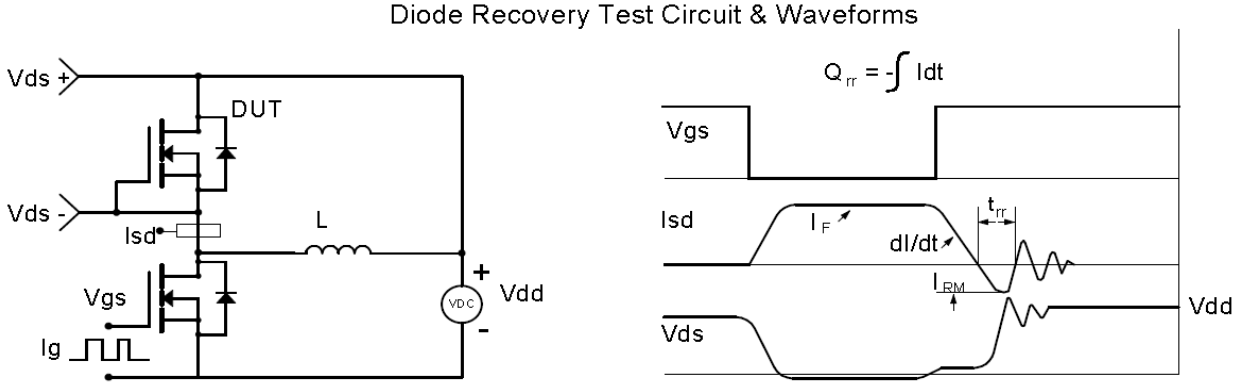
Resistive Switching Test Circuit & Waveforms



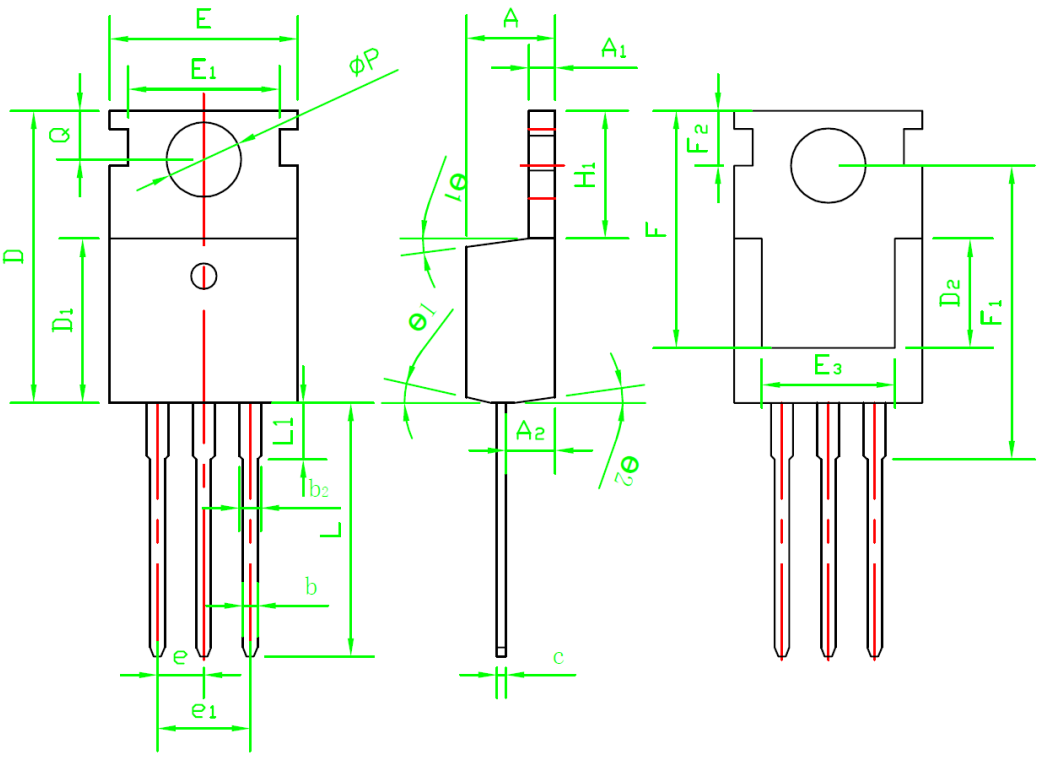
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

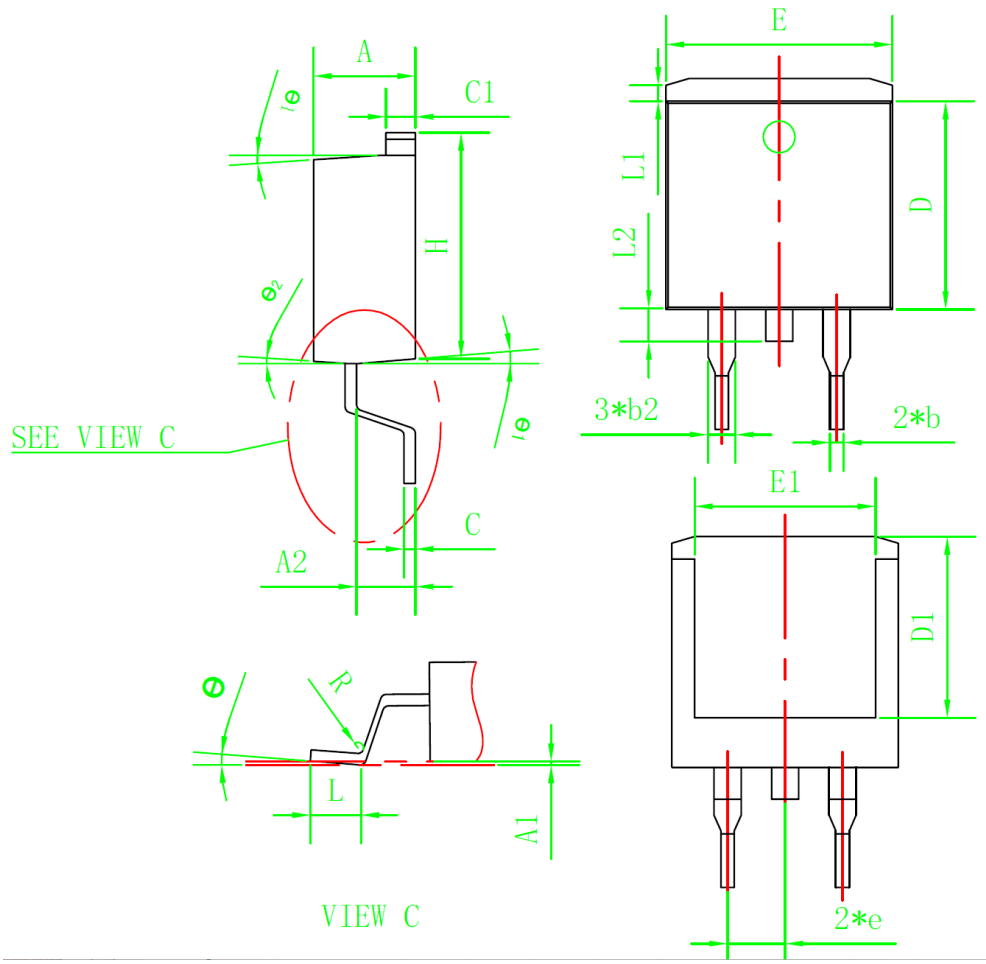


Package Outline: TO-220



SYMBOL	MIN	NOM	MAX
A	4.27	4.57	4.87
A1	1.15	1.30	1.45
A2	2.10	2.40	2.70
b	0.70	0.80	1.00
b2	1.17	1.27	1.50
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.70	6.70	7.00
E	9.70	10.00	10.30
E1	–	8.70	–
E2	9.63	10.00	10.35
E3	7.00	8.00	8.40
e	2.54 BSC		
e1	5.08 BSC		
H1	6.00	6.50	6.85
L	12.75	13.50	13.90
L1	–	3.10	3.40
ØP	3.45	3.60	3.75
Q	2.60	2.80	3.00
θ1	4°	7°	10°
θ2	0°	3°	6°
F	13.30	13.50	13.70
F1	15.50	15.90	16.30
F2	2.80	3.00	3.20

TO-263



SYMBOL	MIN	NOM	MAX
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.50
b	0.70	0.80	1.00
b2	1.25	1.36	1.38
C	0.45	0.50	0.55
C1	1.29	1.30	1.31
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	–	2.54	–
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
θ1	4°	7°	10°
θ2	0°	3°	6°