华润微电子(重庆)有限公司

CRJS750N80G2EQ

SJMOS N-MOSFET 800V, 600mΩ, 7A

Features

- CRM(CQ) Super_Junction technology
- Much lower Ron*A performance for On-state efficiency
- Better efficiency due to very low FOM
- Integrated ESD protection diode
- Easy to use/drive
- AEC-Q101 qualified

Product Summary

$V_{DS,min}$	800V
$R_{DS(on),typ}$	600mΩ
I_D	7A
ESD(HBM)	2000V

Applications

Suitable for PFC and DC-DC stages for:

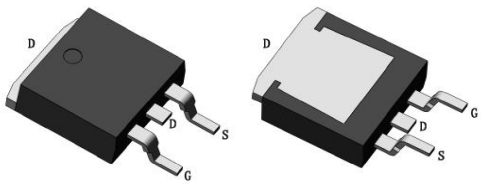
- Unidirectional and bidirectional DC-DC converters,
- On-Board battery Chargers

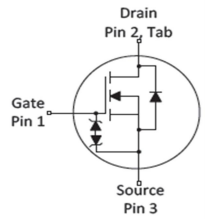
100% DVDS Tested

100% Avalanche Tested

RoHS HF

Top view Bottom view





Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRJS750N80G2EQ	CRJS750N80G2EQ	TO-263	Tape&Reel	N/A	N/A	1000pcs

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	800	V
Continuous drain current [1)] T_C = 25°C T_C = 100°C	I_D	 7 4	A
Pulsed drain current [2)](T_C = 25°C, t_p limited by $T_{j,max}$)	$I_{D,pulse}$	26	A
Avalanche energy, single pulse (L=30mH)	E_{AS}	86	mJ
MOSFET dv/dt ruggedness	dv/dt	50	V/ns
Gate-Source voltage	V_{GS}	±30	V
Power dissipation (T_C = 25°C)	P_{tot}	81	W
Continuous diode forward current(T_C = 25°C)	I_S	7	A
Diode pulse current [2)] (T_C = 25°C)	$I_{S,pulse}$	26	A
Recovery diode dv/dt [3)]	dv/dt	50	V/ns
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

1) Limited by $T_{j,max}$. Maximum Duty Cycle D = 0.50

2) Pulse width t_p limited by $T_{j,max}$

3) Identical low side and high side switch with identical R_g

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Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case	R_{thJC}	-	1.10	1.55	°C/W	
Thermal resistance, junction – ambient	R_{thJA}	-	-	99	°C/W	

Electrical Characteristic (at T_j = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	800	-	-	V	V_{GS}=0V,I_D=250μA
Gate threshold voltage	$V_{GS(th)}$	3	-	4	V	V_{DS}=V_{GS},I_D=250μA
Zero gate voltage drain current	I_{DSS}	- -	- 5	1 -	μA	V_{DS}=800V,V_{GS}=0V T_j=25°C T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	±10	μA	V_{GS}=±30V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	600 1060	750 -	mΩ	V_{GS}=10V,I_D=3.5A, T_j=25°C T_j=150°C
Transconductance	g_{fs}	-	15	-	S	V_{DS}=20V,I_D=3.5A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	500	-	pF	V_{GS}=0V, V_{DS}=100V, f=1MHz
Output Capacitance	C_{oss}	-	22	-		
Reverse Transfer Capacitance	C_{rss}	-	0.6	-		V_{GS}=0V, V_{DS}=100V, f=100kHz
Gate Total Charge	Q_g	-	16	-	nC	V_{GS}=10V, V_{DS}=480V, I_D=3.5A
Gate-Source charge	Q_{gs}	-	4	-		
Gate-Drain charge	Q_{gd}	-	7.4	-		
Gate plateau voltage	$V_{plateau}$	-	5.9	-	V	
Turn-on delay time	$t_{d(on)}$	-	12	-	ns	V_{GS}=10V, I_D=3.5A, V_{DS}=400V, R_g=27Ω
Rise time	t_r	-	28	-		
Turn-off delay time	$t_{d(off)}$	-	60.8	-		
Fall time	t_f	-	27.1	-		
Gate resistance	$R_{g,int}$	-	6.4	-	Ω	f=1MHz

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Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	0.5	0.84	1.0	V	V_{GS}=0V,I_{SD}=3.5A
Body Diode Reverse Recovery Time	t_{rr}	-	232	-	ns	I_{SD}=3.5A di_F/dt=100A/μs V_{DS}=400V
Body Diode Reverse Recovery Charge	Q_{rr}	-	2.1	-	μC	
Body Diode Reverse Recovery Peak Current	I_{rrm}	-	19	-	A	

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Typical Performance Characteristics

Fig 1. Output Characteristics (T_j=25℃)

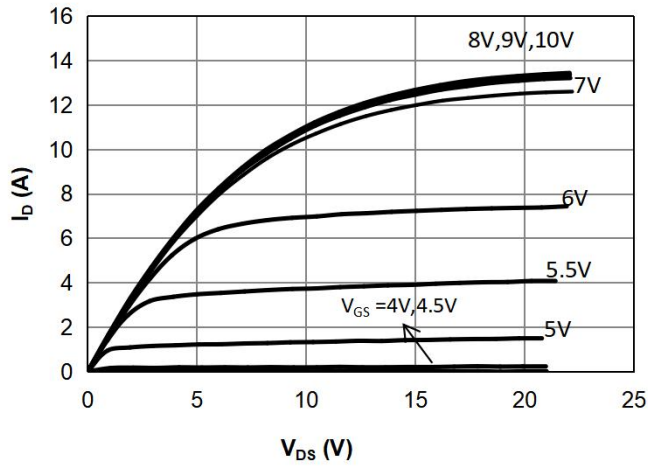


Fig 2. Output Characteristics (T_j=150℃)

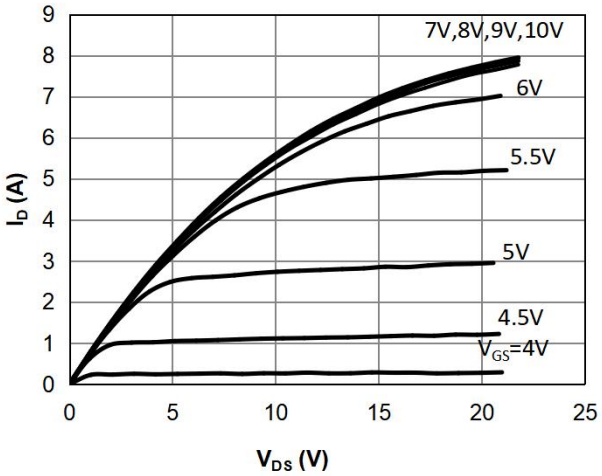


Fig 3: Transfer Characteristics

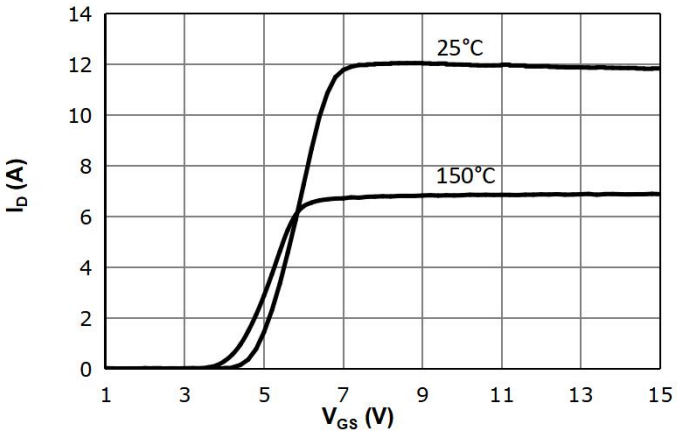


Fig 4: V_{TH} vs. T_j Temperature Characteristics

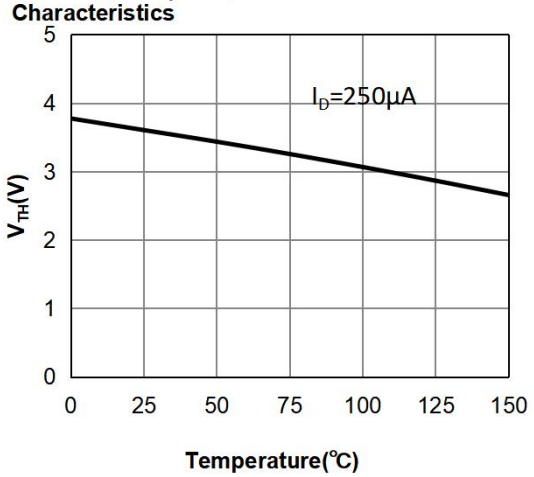


Fig 5: $R_{DS(on)}$ vs. I_{DS} Characteristics(T_j=25℃)

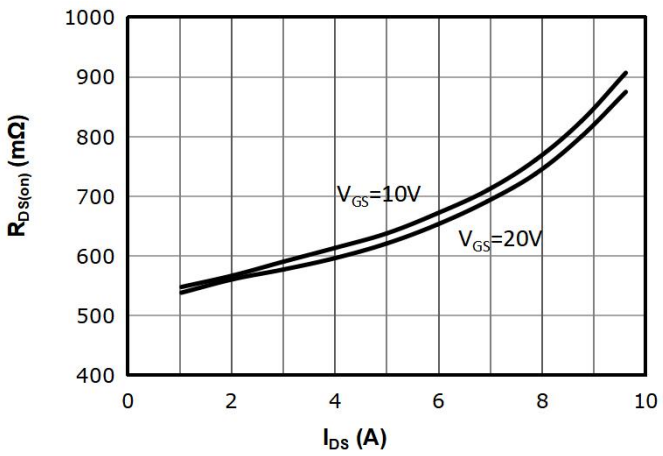
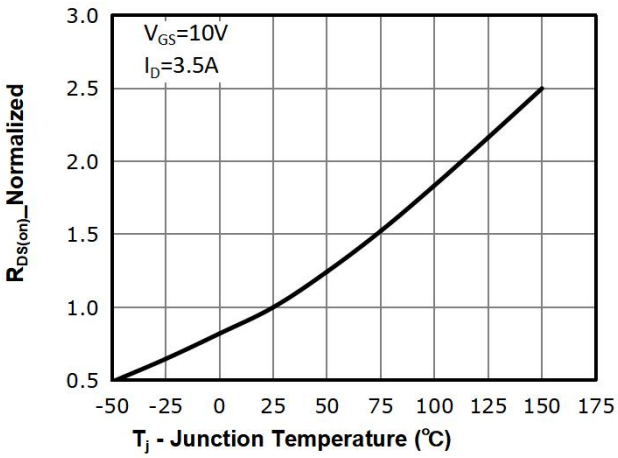


Fig 6: $R_{DS(on)}$ vs. Temperature



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Fig 7: BV_{DSS} vs. Temperature

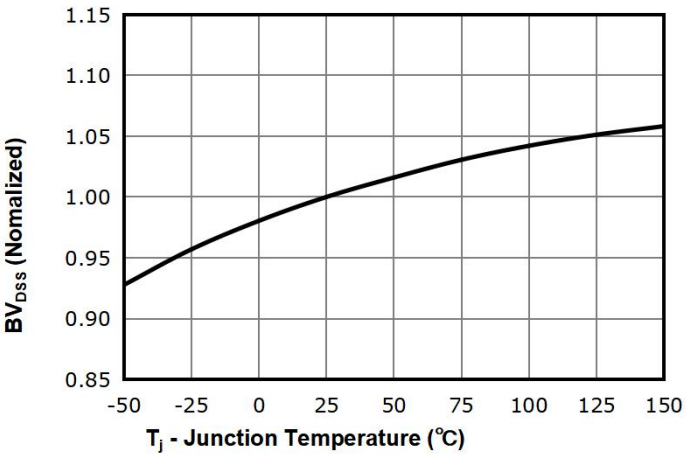


Fig 8: $R_{DS(on)}$ vs. Gate Voltage

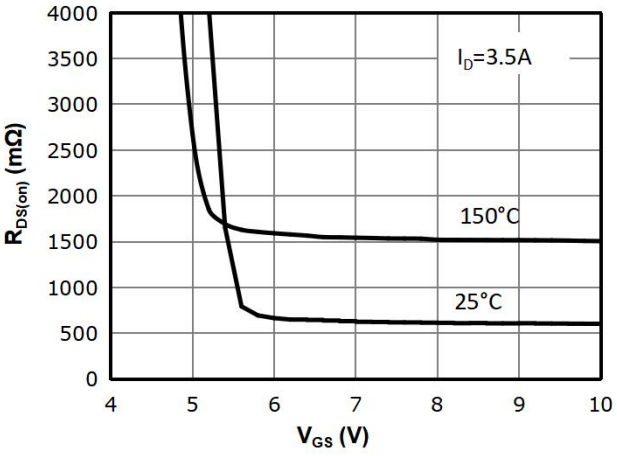


Fig 9: Body-diode Forward Characteristics

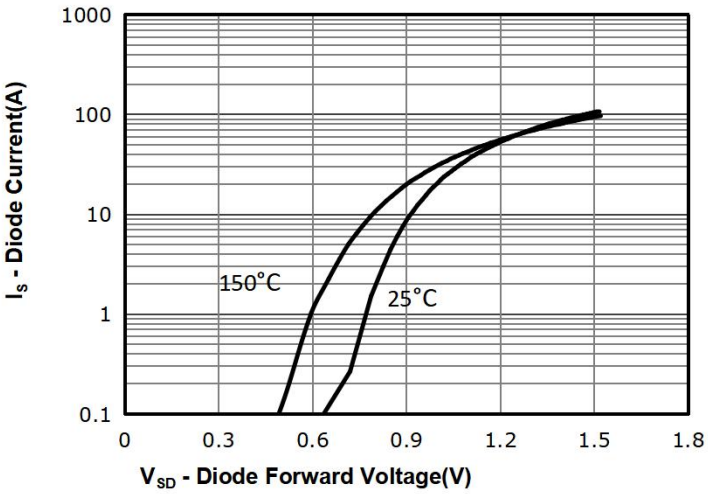


Fig 10: Gate Charge Characteristics

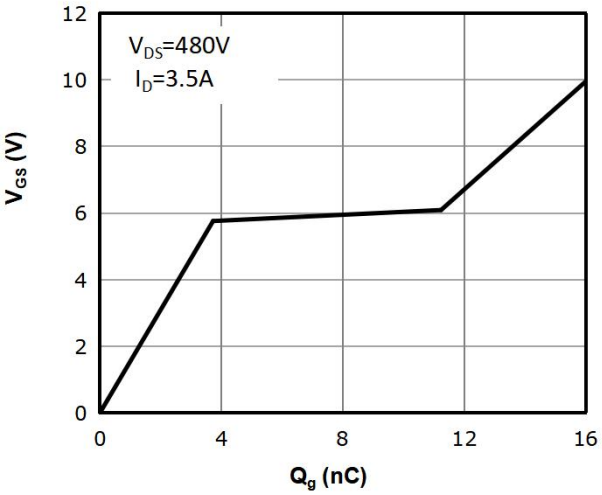


Fig 11: Capacitance Characteristics

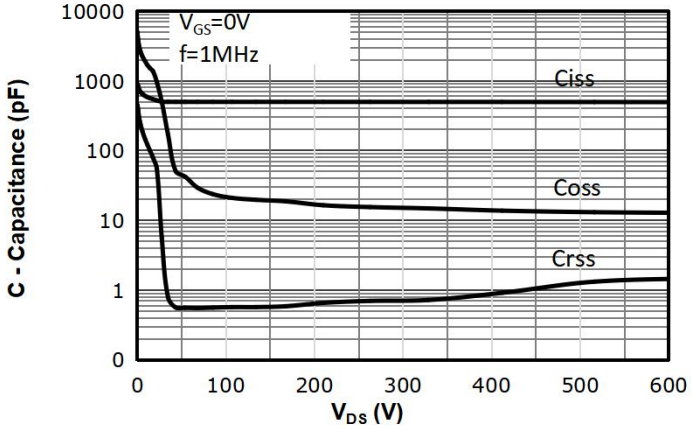
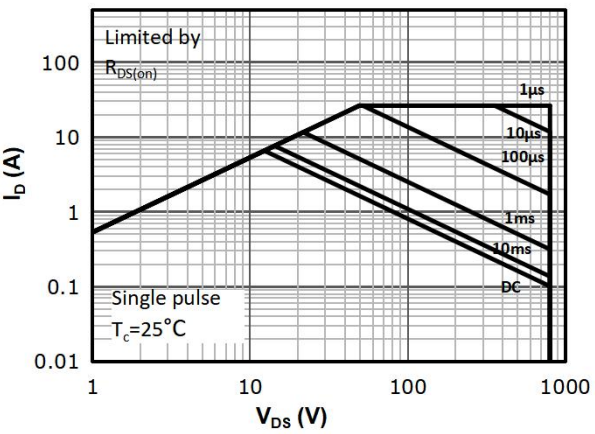
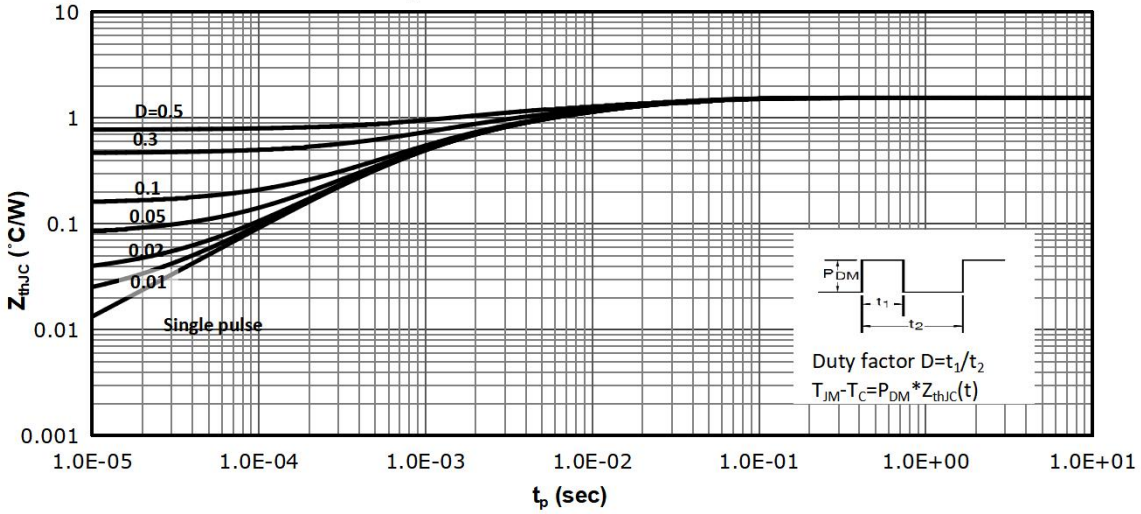


Fig 12: Safe Operating Area



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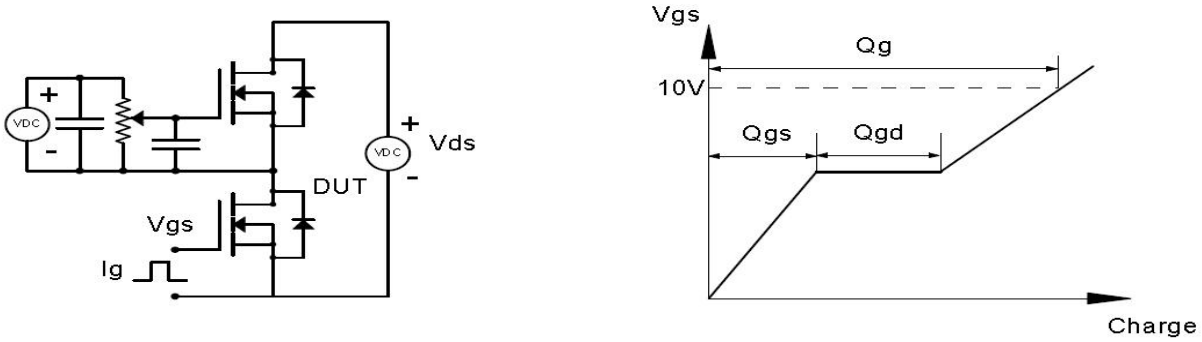
Fig 13: Max. Transient Thermal Impedance



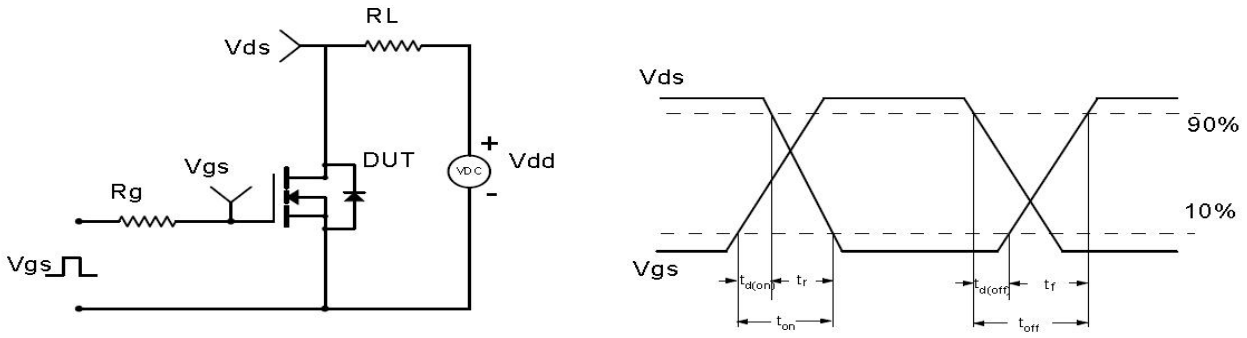
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Test Circuit & Waveform

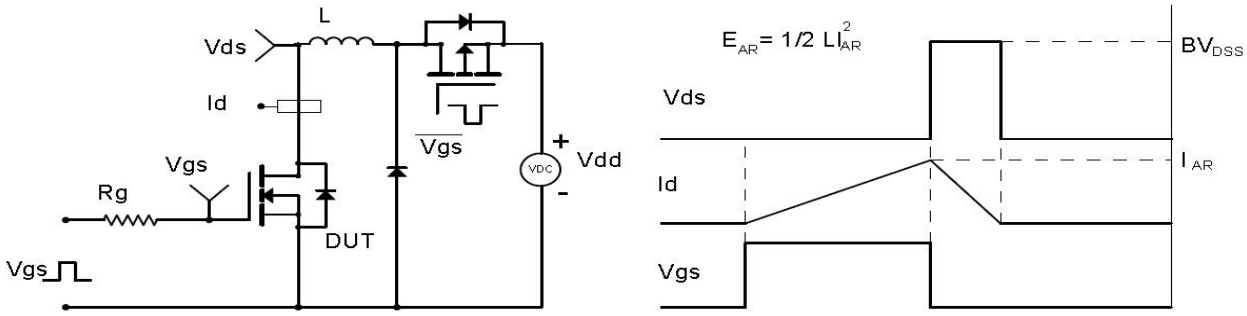
Gate Charge Test Circuit & Waveform



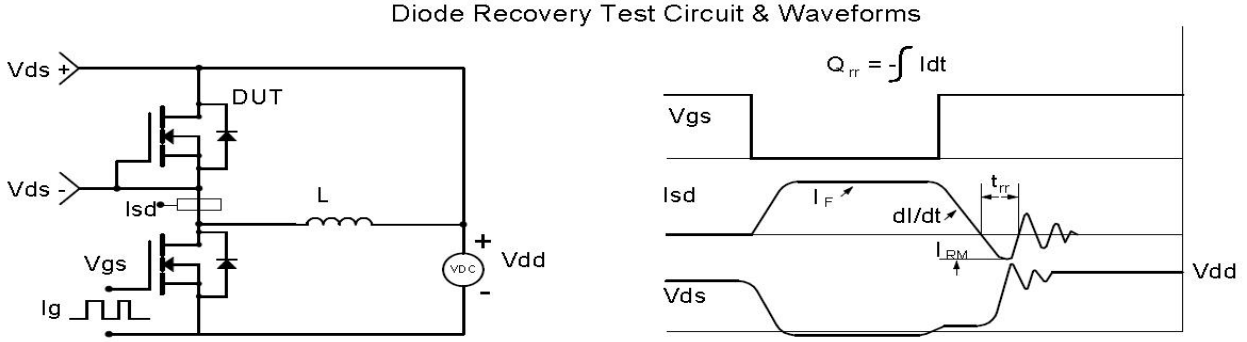
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

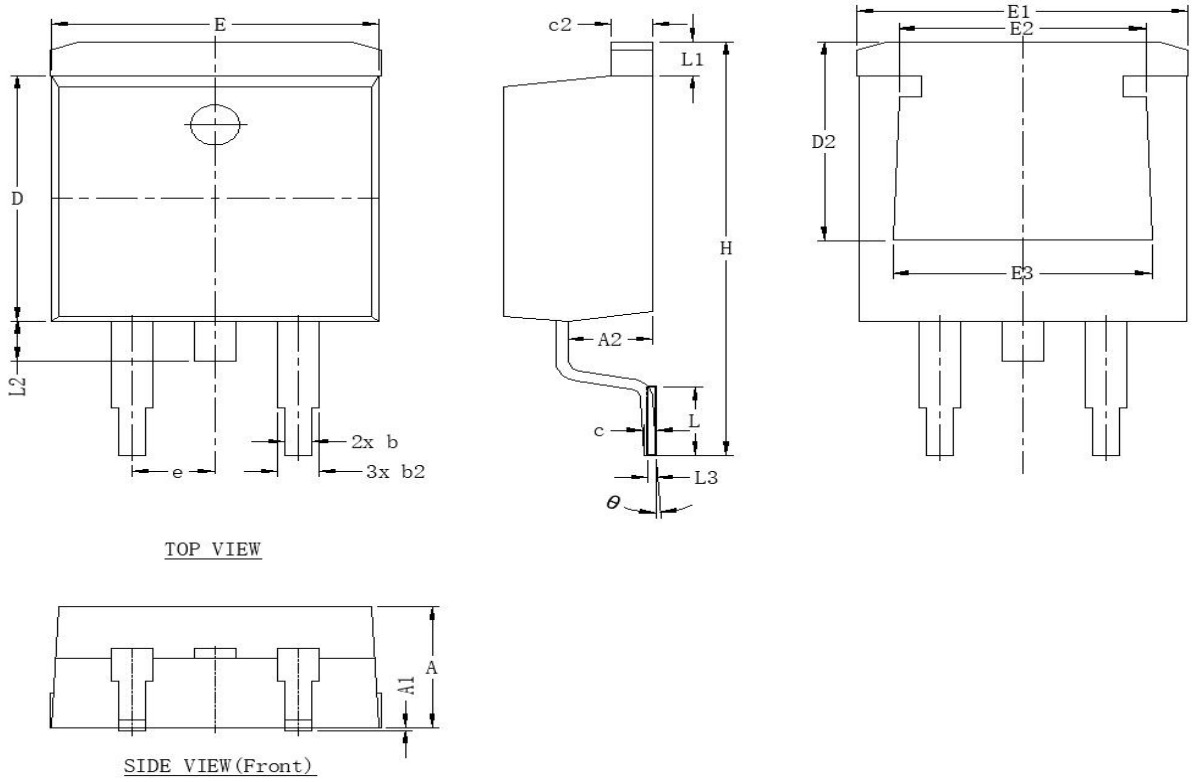


Diode Recovery Test Circuit & Waveforms



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Package Outline: TO-263



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.70	0.173	0.185
A1	0.00	0.25	0.000	0.010
A2	2.20	2.90	0.087	0.114
b	0.68	0.96	0.027	0.038
b2	1.14	1.78	0.045	0.070
c	0.33	0.65	0.013	0.026
c2	1.17	1.41	0.046	0.056
D	9.00	9.40	0.354	0.370
D2	7.10	7.70	0.280	0.303
E	9.80	10.20	0.386	0.402
E1	9.80	10.40	0.386	0.409
E2	7.00	8.60	0.276	0.339
E3	7.52	8.32	0.296	0.328
e	2.54 BSC		0.100 BSC	
H	15.20	15.80	0.598	0.622
L	1.78	2.79	0.070	0.110
L1	0.97	1.57	0.038	0.062
L2	1.20	1.78	0.047	0.070
L3	0.254 BSC		0.010 BSC	
θ	0°	8°	0°	8°

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Marking



NOTE:
NXBBAAAA

N	—WB code (Usually omitted)
X	—Assembly location code
BB	—Fab code
AAAA	—Lot code

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Revision History

Revison	Major changes
1.0	First version
2.0	Formal version
3.0	Update POD information

Disclaimer

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