华润微电子(重庆)有限公司

CRTE110N03LZ

Trench N-MOSFET 30V, 7.5mΩ, 19A

Features

- Uses CRM(CQ) advanced Trench MOS technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent Q_gx$R_{DS(on)}$ product(FOM)
- Qualified according to JEDEC criteria
- AEC-Q101 Pass

Applications

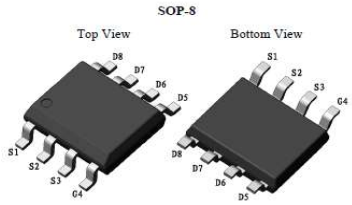
- Motor control and drive
- Battery management System
- UPS (Uninterrupible Power Supplies)

Product Summary

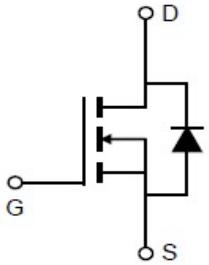
V_{DS}	30V
$R_{DS(on).typ}$	7.5mΩ
I_D	19A

100% DVDS Tested
100% Avalanche Tested

RoHS HF



CRTE110N03LZ



Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRTE110N03LZ	TE110N03LZ	SOP-8	Reel	N/A	N/A	4000pcs

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	30	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 100°C (Silicon limit)	I_D	 19 13	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	76	A
Avalanche energy, single pulse (I_D = 19A, Rg=25Ω)[1]	E_{AS}	88	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	6.9	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°C
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	Tsold	260	°C

※. Notes:
1.EAS is tested at starting Tj = 25℃, L = 0.5mH, IAS =19A, VGS = 10V.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – lead.	R_{thJL}	21.7	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	48	

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

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250uA
		30	-	-	V	V_{GS}=0V, I_D=1mA
Gate threshold voltage	$V_{GS(th)}$	0.8	1.3	1.8	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- -	1 100	μA	V_{DS}=30V,V_{GS}=0V T_j=25°C T_j=125°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- - -	7.5 13.5 9.5	11 18 13	mΩ	V_{GS}=10V,ID=16A T_j=25°C T_j=175°C V_{GS}=4.5V,ID=10A
Transconductance	g_{fs}	26	52	104	S	V_{DS}=5V, I_D=16A
Dynamic Characteristic						
Input Capacitance	C_{iss}	695	1043	1565	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Output Capacitance	C_{oss}	111	166	249		
Reverse Transfer Capacitance	C_{rss}	60	120	240		
Gate Total Charge	Q_G	15	23	35	nC	V_{GS}=10V, V_{DS}=15V, I_D=16A
Gate-Source charge	Q_{gs}	2	3.2	5		
Gate-Drain charge	Q_{gd}	2	4.5	9		
Turn-on delay time	$t_{d(on)}$	4	7.3	15	ns	V_{GS}=10V, V_{DD}=15V, R_{G_ext}=2.7Ω,ID=16A
Rise time	t_r	61	91	137		
Turn-off delay time	$t_{d(off)}$	18	27	41		
Fall time	t_f	64	96	144		
Gate resistance	R_G	0.2	2.5	10	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	0.8	1.3	V	V_{GS}=0V,I_{SD}=16A
Body Diode Continuous Forward Current	I_S	-	-	19	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}	5.5	11	22	ns	I_F=16A, dI/dt=100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	2	4.1	8	nC	

Typical Performance Characteristics

Fig 1: Output Characteristics

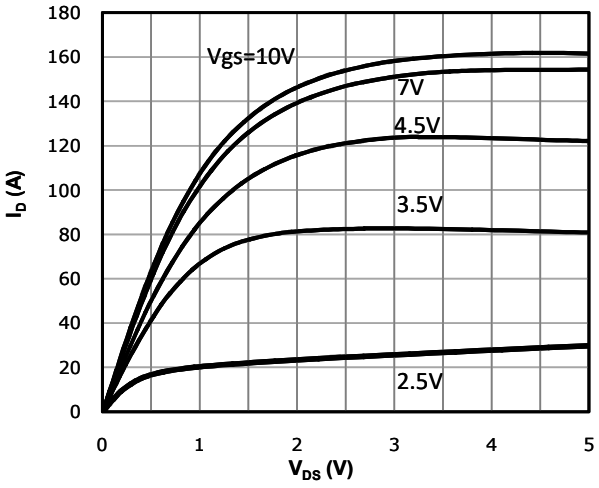


Fig 2: Transfer Characteristics

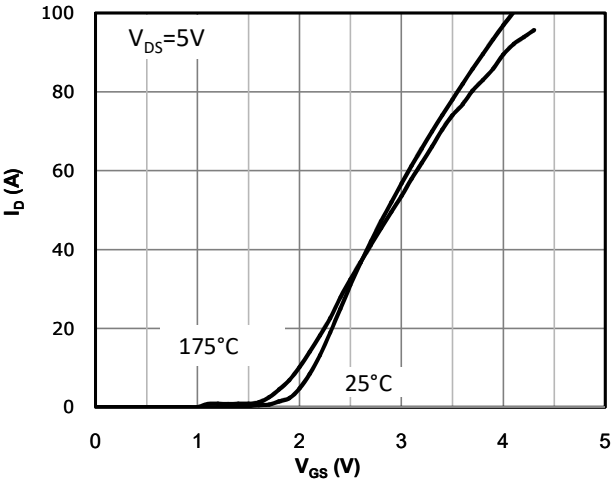


Fig 3: Rds(on) vs Drain Current and Gate Voltage

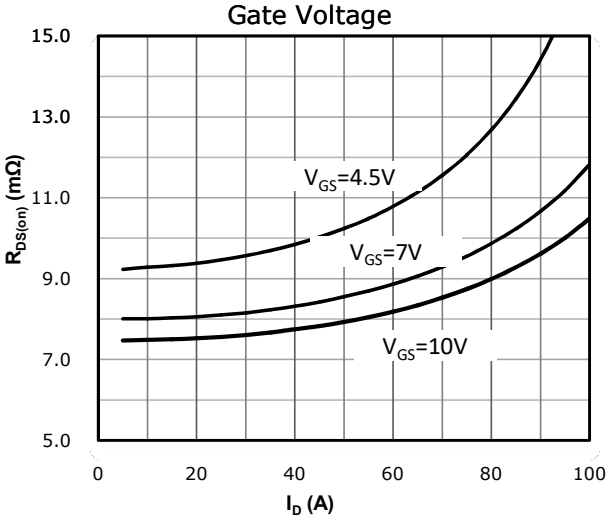


Fig 4: Rds(on) vs Gate Voltage

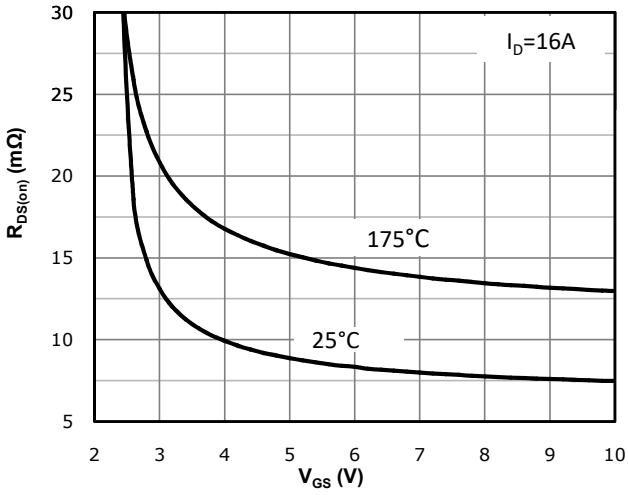


Fig 5: Rds(on) vs. Temperature

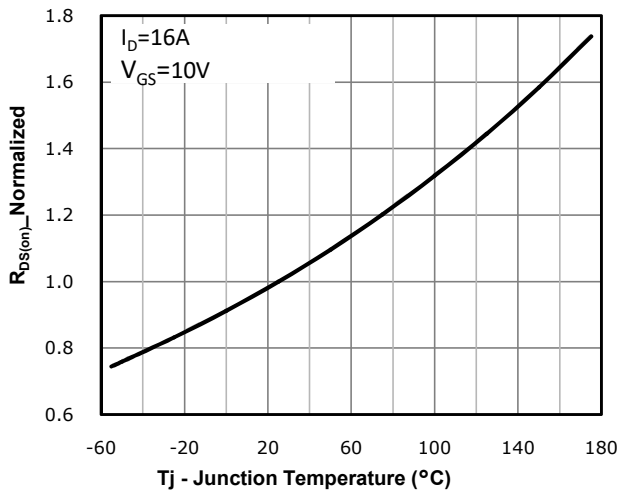


Fig 6: Vgs(th) vs. Temperature

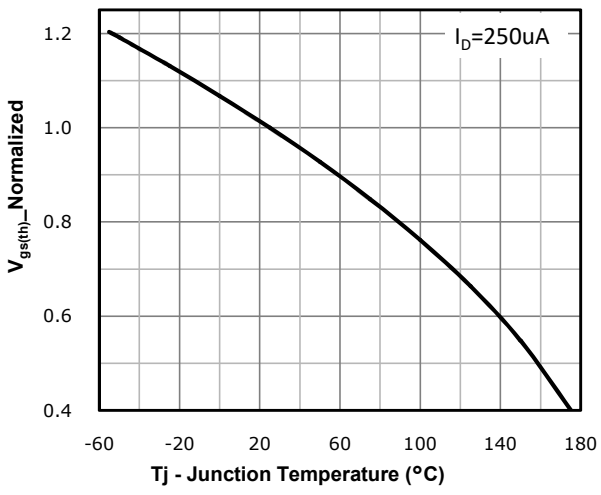


Fig 7: BVdss vs. Temperature

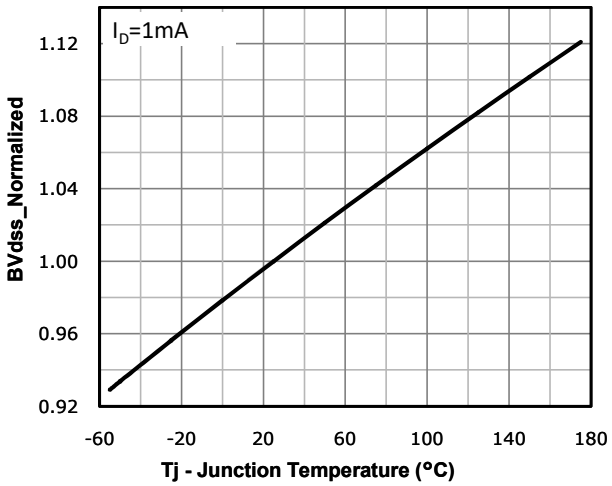


Fig 8: Capacitance Characteristics

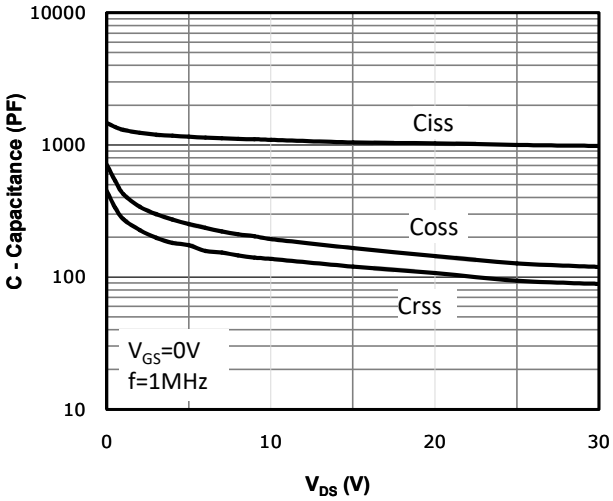


Fig 9: Gate Charge Characteristics

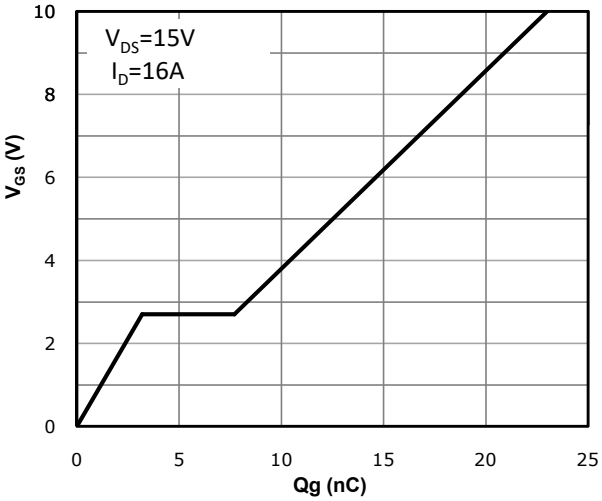


Fig 10: Body-diode Forward Characteristics

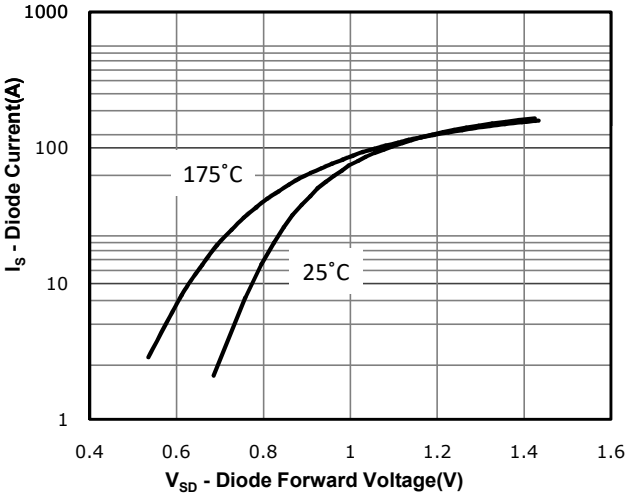


Fig 11: Power Dissipation

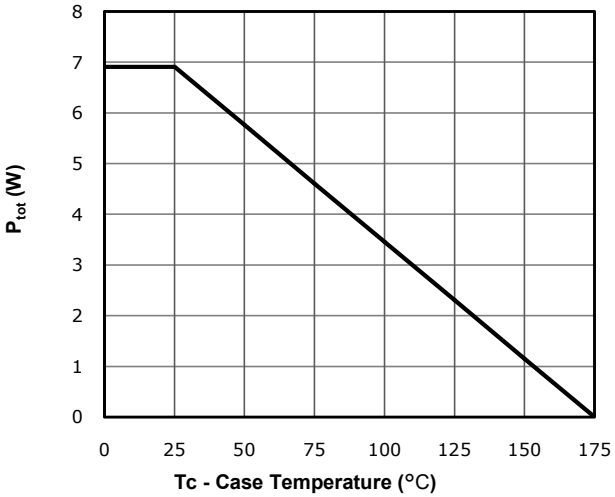


Fig 12: Drain Current Derating

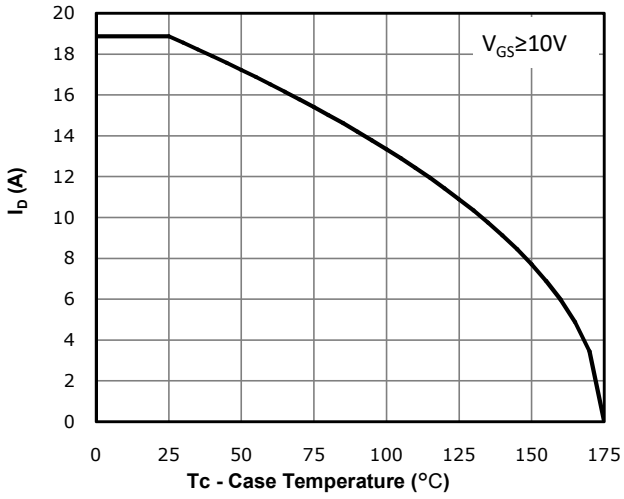


Fig 13: Safe Operating Area

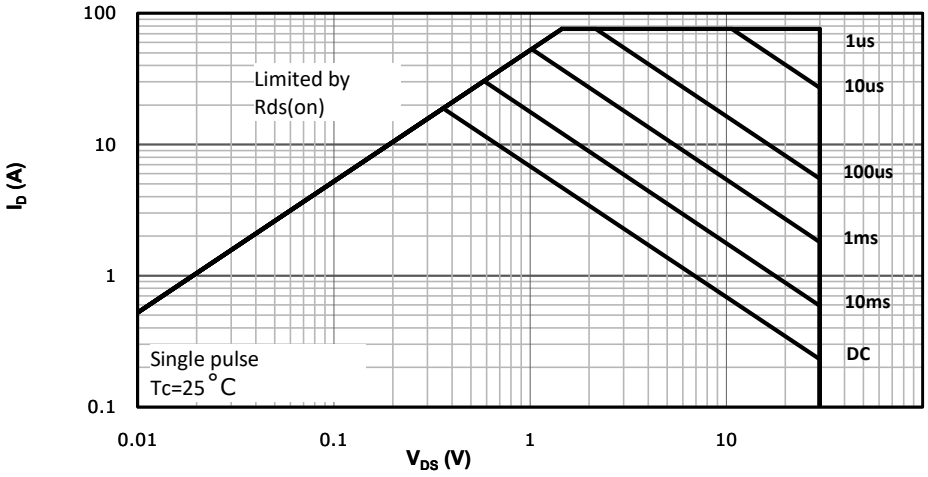
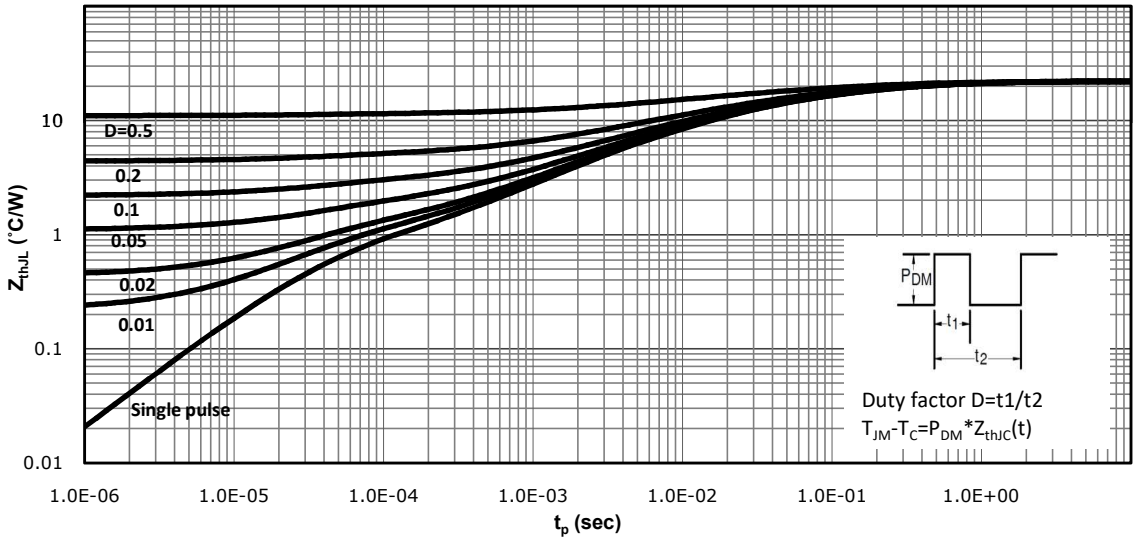
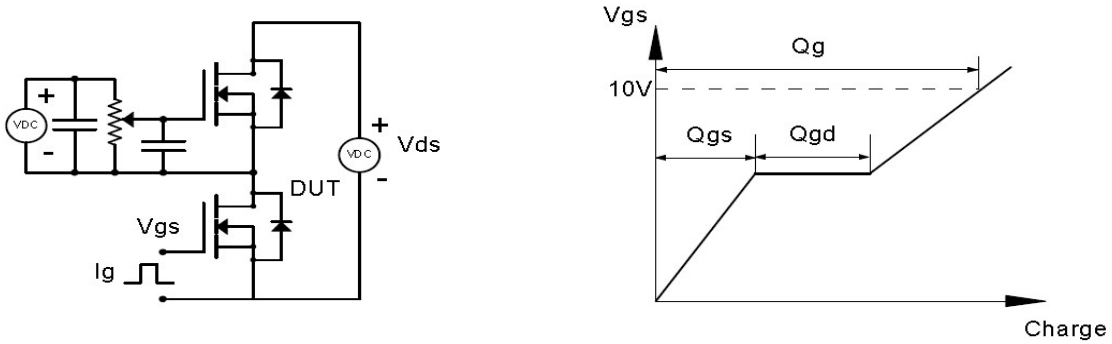


Fig 14: Max. Transient Thermal Impedance

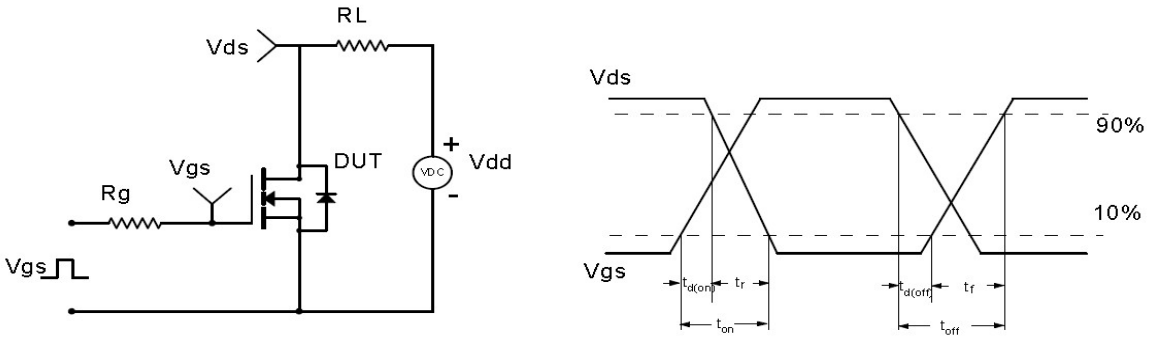


Test Circuit & Waveform

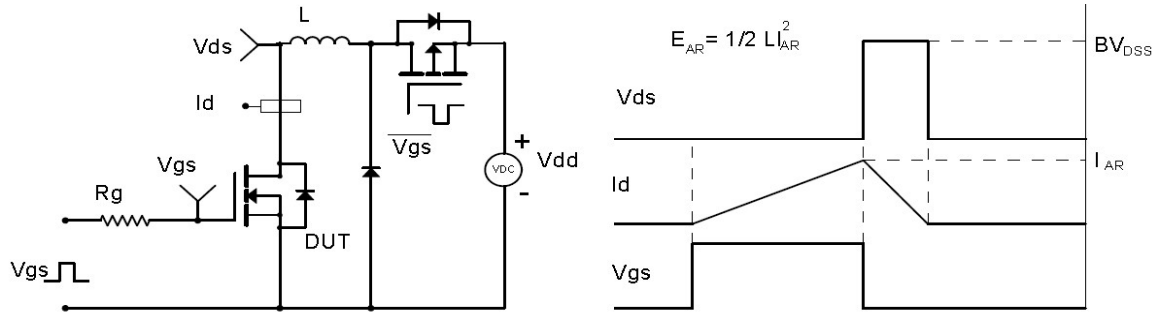
Gate Charge Test Circuit & Waveform



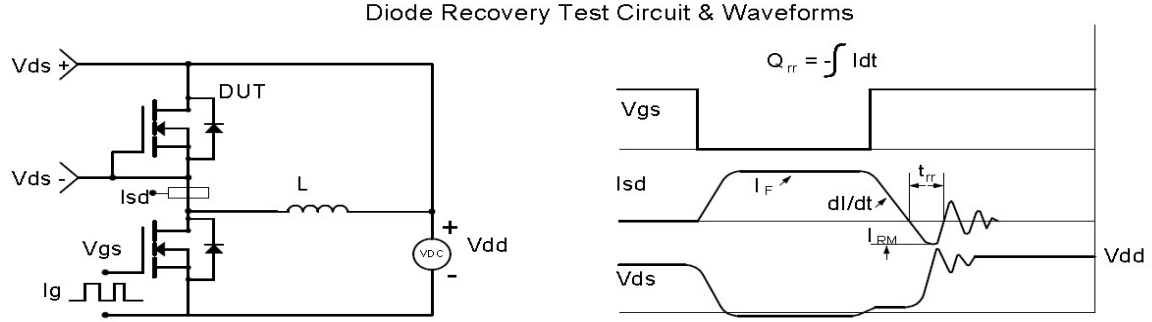
Resistive Switching Test Circuit & Waveforms



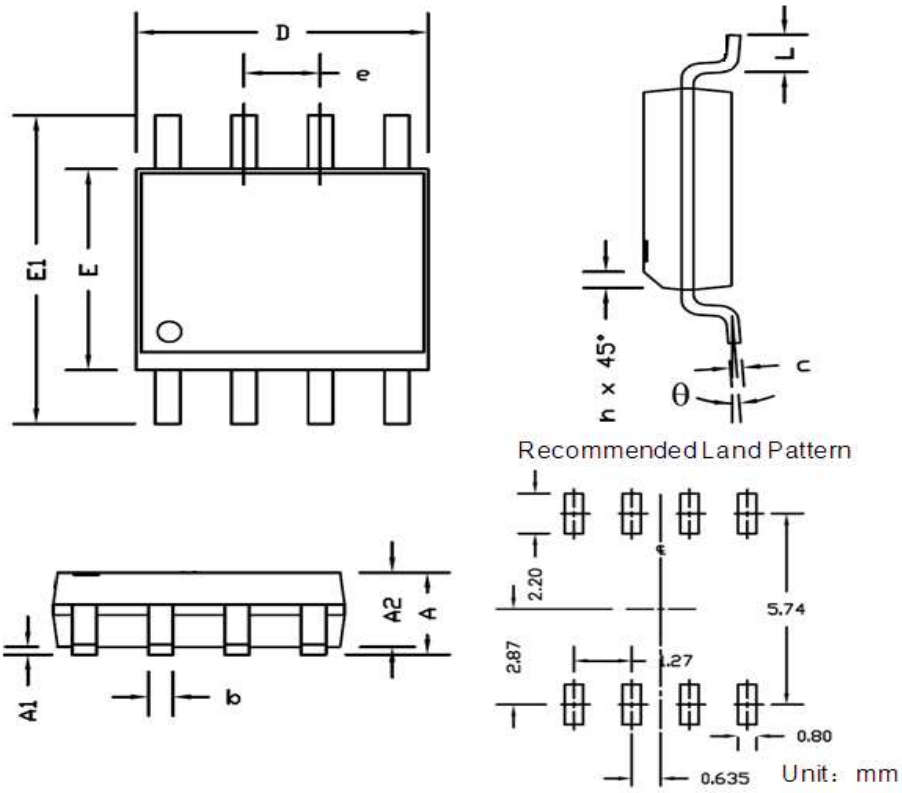
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: SOP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	1.65	0.049	0.065
b	0.33	0.51	0.013	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
e	1.27 BSC.		0.050 BSC.	
E	3.80	4.00	0.150	0.157
E1	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

Marking

NOTE:
NXBBAAAAY

N	—Wire Bond code
X	—Assembly location code
BB	—Fab code
AAAA	—Lot code
Y	—Bin code

Revision History

Revision	Date	Major changes
1.0	2023/6/11	Release of Preliminary version.

Disclaimer

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