

Features

- CRM(CQ) Super_Junction technology
- Much lower R_{on}^*A performance for On-state efficiency
- Better efficiency due to very low FOM
- Ultra-fast body diode

Applications

- LED/LCD/PDP TV and monitor Lighting
- Solar/Renewable/UPS-Micro Inverter System
- Charger
- Power Supply

Product Summary

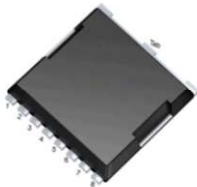
V_{DS}	650V
$R_{DS(on),typ}$	90mΩ
I_D	27A

100% DVDS Tested

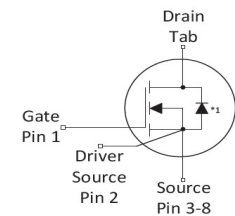
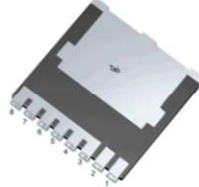
100% Avalanche Tested



Top view



Bottom view



*1: Internal body diode

Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRJZ99N65G2BF	JZ99N65G2BF	TOLL	Tape&Reel	N/A	N/A	2000pcs

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Continuous drain current ¹⁾	I_D	27	A
$T_C = 25^\circ\text{C}$		17	A
$T_C = 100^\circ\text{C}$			
Pulsed drain current ²⁾ ($T_C = 25^\circ\text{C}$, t_p limited by $T_{j,max}$)	$I_{D,pulse}$	82	A
Avalanche energy, single pulse ($L=30\text{mH}$)	E_{AS}	480	mJ
MOSFET dv/dt ruggedness	dv/dt	50	V/ns
Gate-Source voltage	V_{GS}	± 30	V
Power dissipation ($T_C = 25^\circ\text{C}$)	P_{tot}	198	W
Continuous diode forward current ($T_C = 25^\circ\text{C}$)	I_S	27	A
Diode pulse current ²⁾ ($T_C = 25^\circ\text{C}$)	$I_{S,pulse}$	82	A
Recovery diode dv/dt ³⁾	dv/dt	50	V/ns
Maximum diode commutation speed	di_F/dt	800	A/ μs
Operating junction and storage temperature	T_j, T_{stg}	-55...+150	$^\circ\text{C}$

1) Limited by T_j . Maximum Duty Cycle $D = 0.50$

2) Pulse width t_p limited by T_j

3) Identical low side and high side switch with identical $R_{DS(on)}$

华润微电子有限公司

功率器件事业群

Thermal Resistance

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Thermal resistance, junction – case	R_{thJC}	-	0.45	0.63	°C/W	
Thermal resistance, junction – ambient	R_{thJA}	-	-	56	°C/W	

Electrical Characteristic (at $T_j = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		

Static Characteristic

Drain-source breakdown voltage	BV_{DSS}	650	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	3.2	-	4.6	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	I_{DSS}	-	-	5	μA	$V_{DS}=650V, V_{GS}=0V$ $T_j=25^\circ\text{C}$
		-	800	-		$T_j=150^\circ\text{C}$
Gate-source leakage current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 30V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	90	103	mΩ	$V_{GS}=10V, I_D=17A,$ $T_j=25^\circ\text{C}$
		-	230	-		$T_j=150^\circ\text{C}$
Transconductance	g_{fs}	-	19	-	S	$V_{DS}=20V, I_D=17A$

Dynamic Characteristic

Input Capacitance	C_{iss}	-	1900	-	pF	$V_{GS}=0V, V_{DS}=100V, f=1\text{MHz}$
Output Capacitance	C_{oss}	-	117	-		
Reverse Transfer Capacitance	C_{rss}	-	2.2	-		
Gate Total Charge	Q_g	-	70	-	nC	$V_{GS}=10V, V_{DS}=480V, I_D=17A$
Gate-Source charge	Q_{gs}	-	17	-		
Gate-Drain charge	Q_{gd}	-	45	-		
Gate plateau voltage	$V_{plateau}$	-	7.7	-	V	
Turn-on delay time	$t_{d(on)}$	-	50	-	ns	$V_{GS}=10V, I_D=17A, V_{DS}=400V,$ $R_g=27\Omega$
Rise time	t_r	-	100	-		
Turn-off delay time	$t_{d(off)}$	-	180	-		
Fall time	t_f	-	50	-		
Gate resistance	$R_{g,int}$	-	0.9	-	Ω	$f=1\text{MHz}$

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	0.7	0.9	1.1	V	$V_{GS}=0V, I_{SD}=17A$
Body Diode Reverse Recovery Time	t_{rr}	-	140	-	ns	$I_{SD}=17A$ $di_f/dt=100A/\mu s$
Body Diode Reverse Recovery Charge	Q_{rr}	-	0.89	-	μC	$V_{DS}=400V$

Typical Performance Characteristics

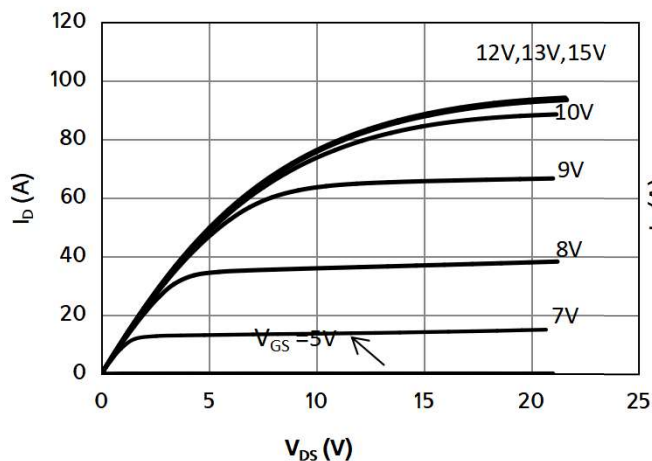
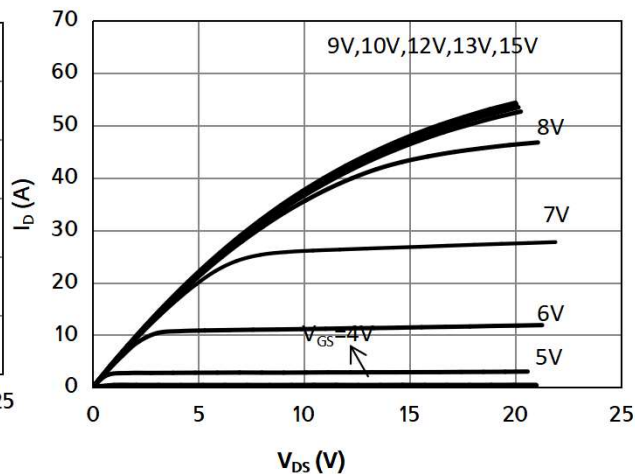
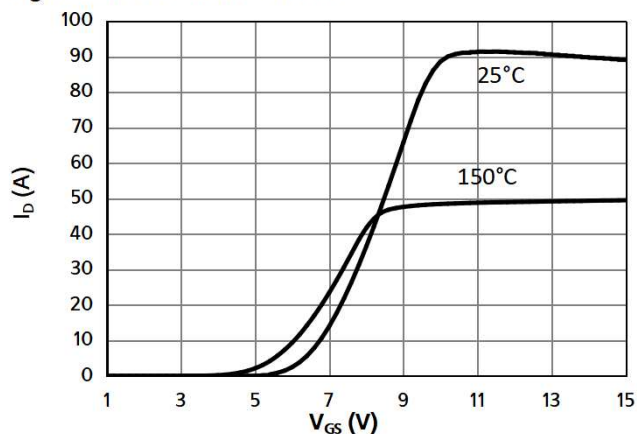
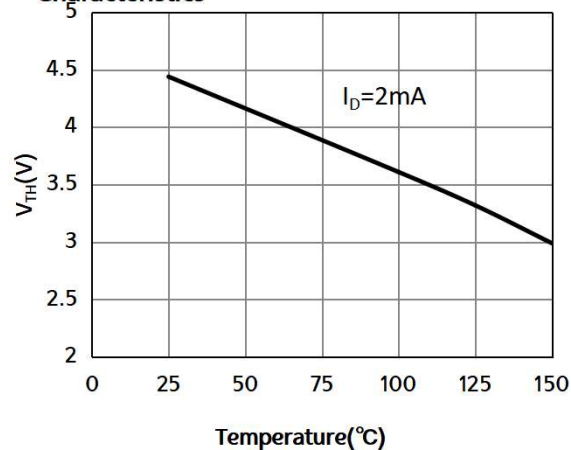
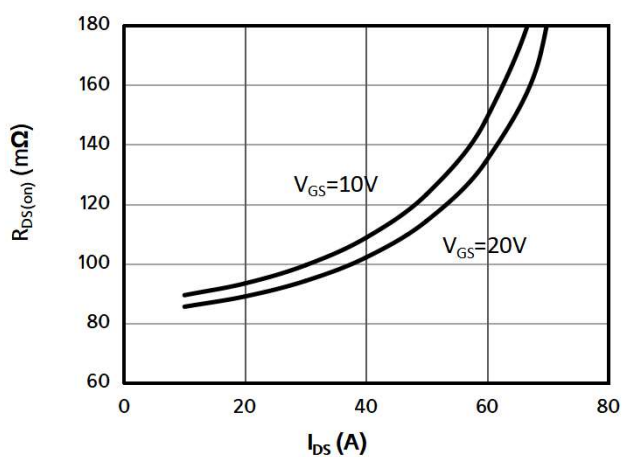
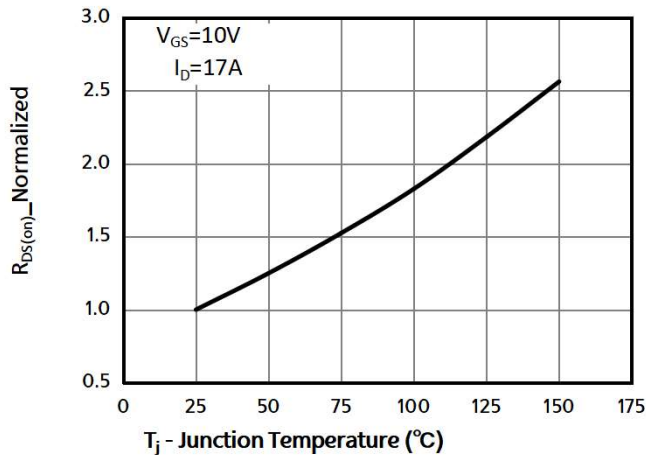
Fig 1. Output Characteristics ($T_j=25^\circ\text{C}$)

Fig 2. Output Characteristics ($T_j=150^\circ\text{C}$)

Fig 3: Transfer Characteristics

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

Fig 5: $R_{DS(on)}$ vs. I_{DS} Characteristics ($T_j=25^\circ\text{C}$)

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


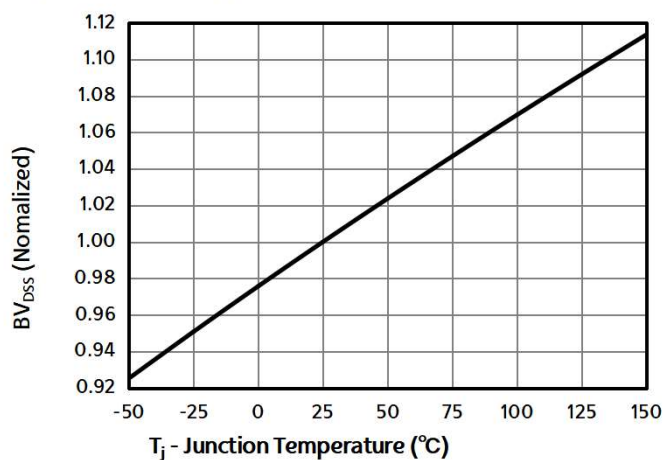
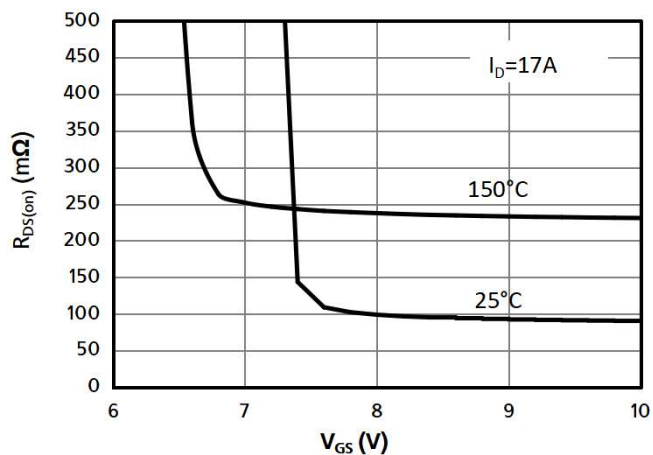
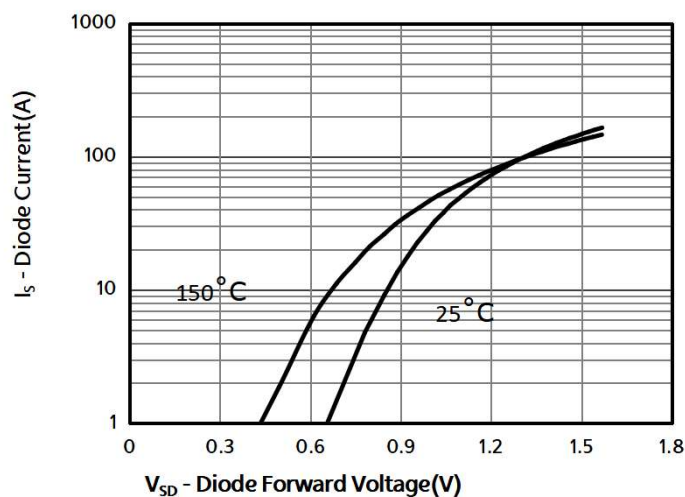
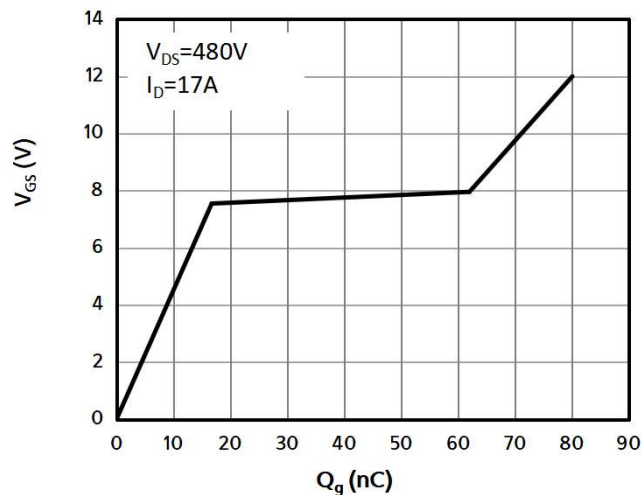
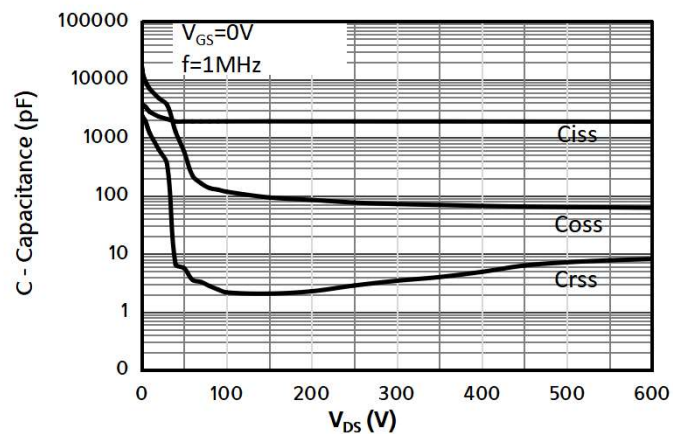
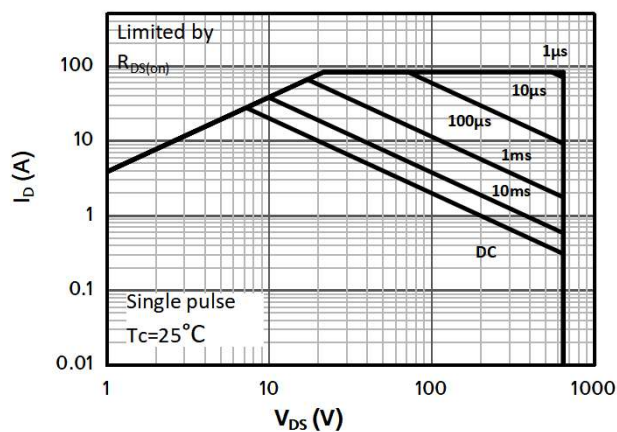
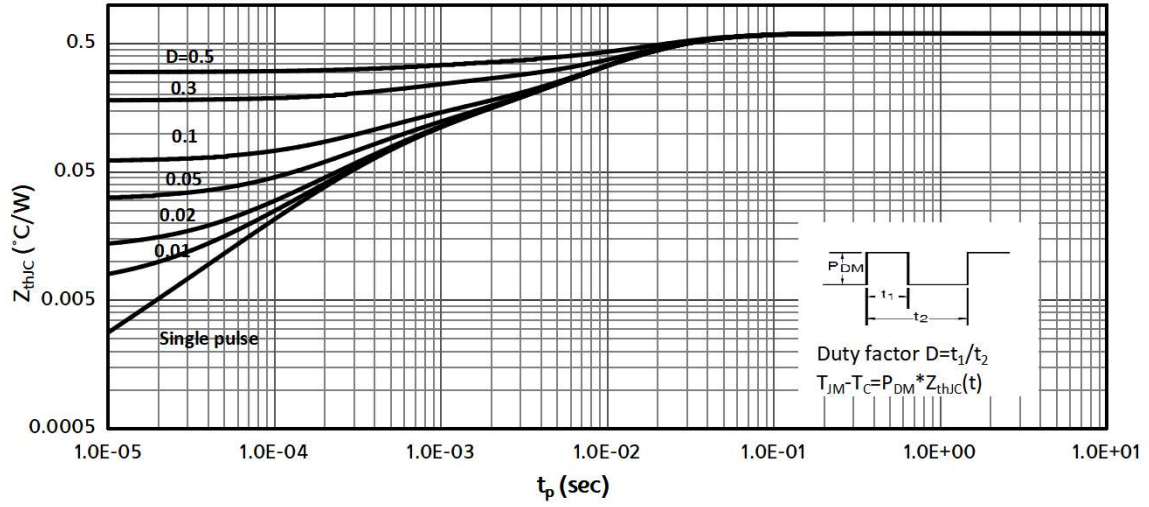
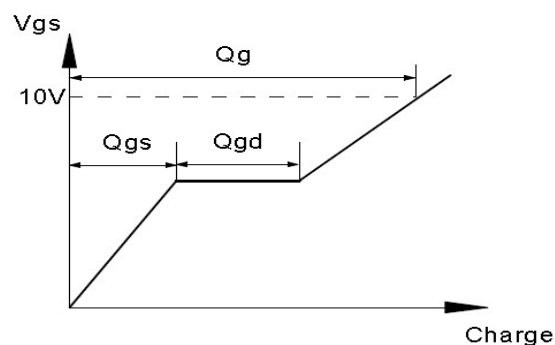
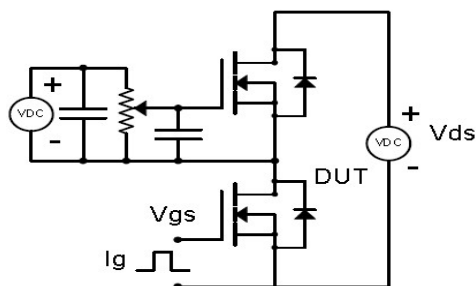
Fig 7: BV_{DSS} vs. Temperature

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


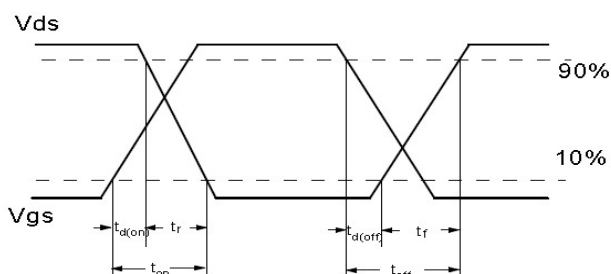
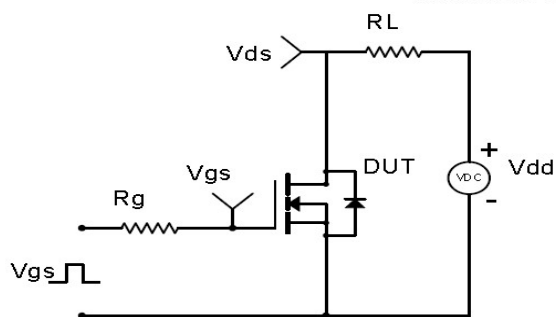
Fig 13: Max. Transient Thermal Impedance


Test Circuit & Waveform

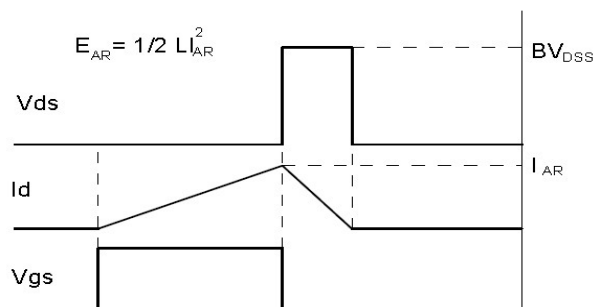
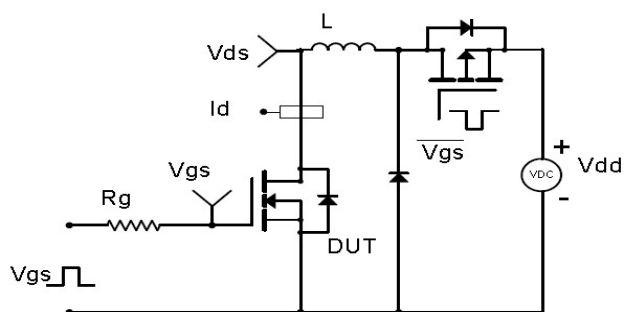
Gate Charge Test Circuit & Waveform



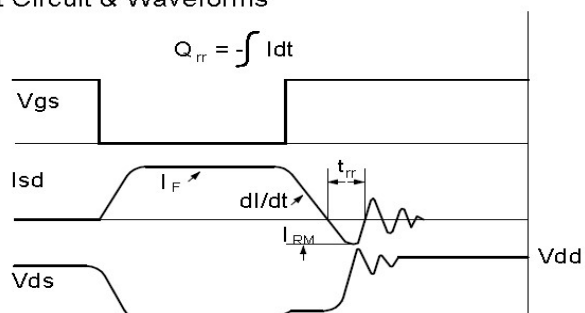
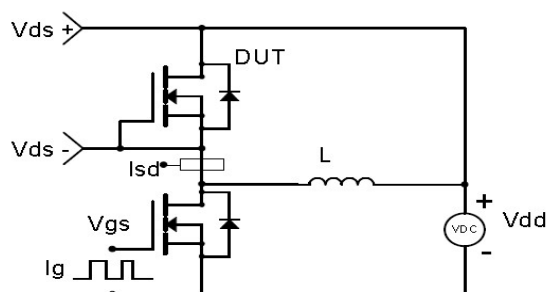
Resistive Switching Test Circuit & Waveforms

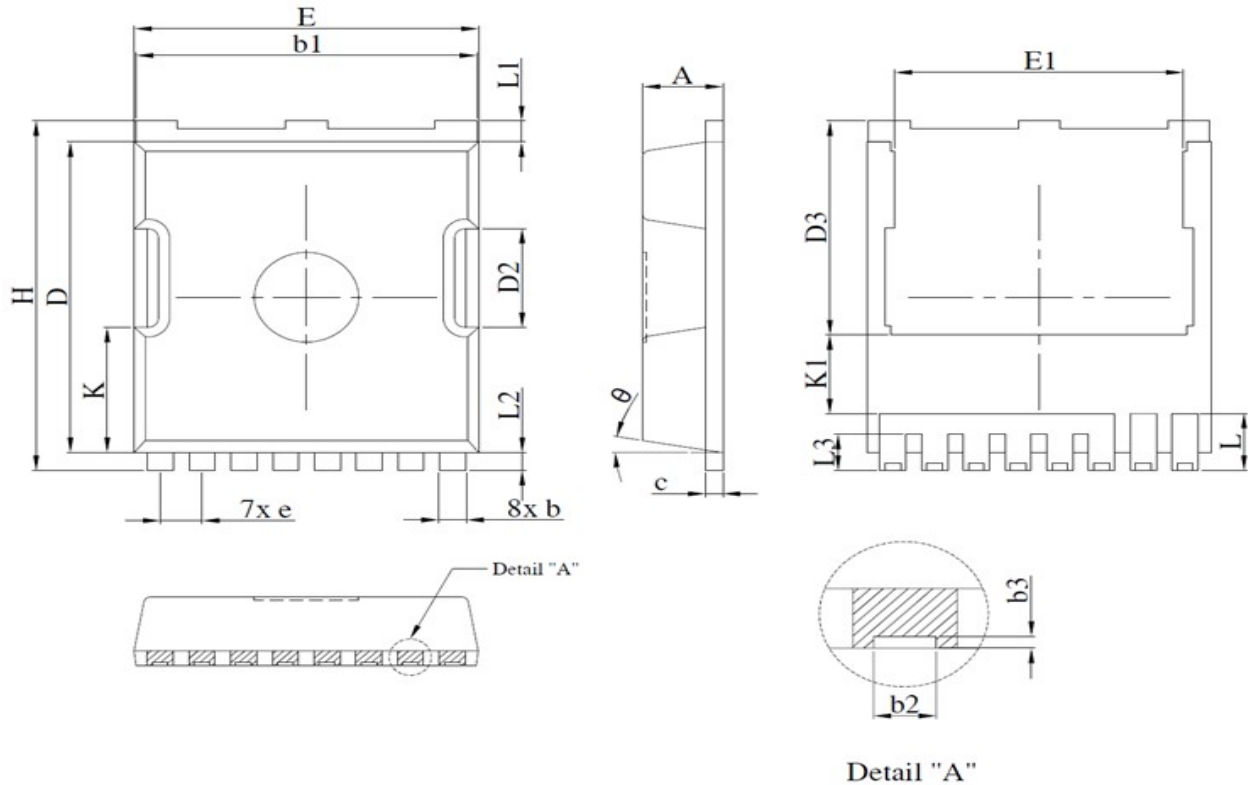


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: TOLL


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
b	0.65	0.90	0.026	0.035
b1	9.65	9.95	0.380	0.392
b2	0.45 REF		0.018 REF	
b3	0.10 REF		0.004 REF	
c	0.35	0.65	0.014	0.026
D	10.18	10.58	0.401	0.417
D2	3.15	3.45	0.124	0.136
D3	6.80	7.30	0.268	0.287
e	1.20 BSC		0.047 BSC	
E	9.70	10.10	0.382	0.398
E1	7.95	8.65	0.313	0.341
H	11.48	11.88	0.452	0.468
K	4.18 REF		0.165 REF	
K1	2.45	--	0.096	--
L	1.60	2.10	0.063	0.083
L1	0.50	0.90	0.020	0.035
L2	0.40	0.80	0.016	0.031
L3	1.00	1.30	0.039	0.051
θ	10° REF		10° REF	

Marking**NOTE:**

NXBBAAAA

N —WB code (Usually omitted)

X —Assembly location code

BB —Fab code

AAAA —Lot code

**Revision History**

Revision	Major changes
2.0	Final version

Disclaimer

Unless otherwise specified in the datasheet, the product is designed and qualified as a standard commercial product and is not intended for use in applications that require extraordinary levels of quality and reliability, such as automotive, aviation/aerospace and life-support devices or systems.

Any and all semiconductor products have certain probability to fail or malfunction, which may result in personal injury, death or property damage. Customer are solely responsible for providing adequate safe measures when design their systems.

CRM(CQ) reserves the right to improve product design, function and reliability without notice.