华润微电子(重庆)有限公司

CRJMH74M65EMAQ

N-channel Half-bridge topology Power MOSFET 650V, 41mΩ, 62A

Features

- AQG 324 qualified
- Half bridge power module
- 650V blocking voltage
- Fast recovery body diode
- Very low switching energies
- Low package inductance
- Dice on direct bond copper(DBC) substrate
- Low thermal resistance

Applications

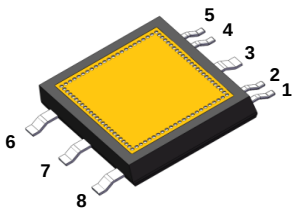
- Switching applications

Product Summary

VDS	650V
$R_{DS(on)\_typ}$	41mΩ
I_D	62A

100% DVDS Tested

100% Avalanche Tested



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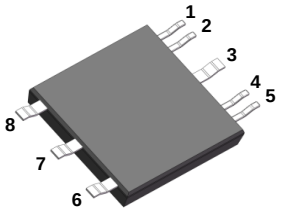
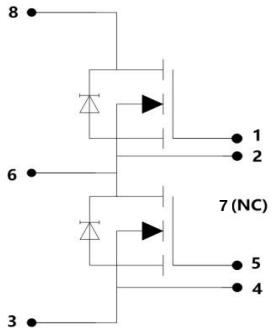




Package Marking and Ordering Information

Part #	Marking	Package	Packing	Reel Size	Tape Width	Qty
CRJMH74M65EMAQ	CRJMH74M65EMAQ	MSOP8	Tape&Reel	N/A	N/A	200pcs

Absolute Maximum Ratings

Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	650	V
Continuous drain current [1] T_C = 25°C T_C = 100°C	I_D	 62 39	 A
Pulsed drain current [2] (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	250	A
Avalanche energy, single pulse (L=30mH, Rg=30Ω)	E_{AS}	1500	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}	424	W
Continuous diode forward current(T_C = 25°C)	I_S	62	A
Diode pulse current [2] (T_C = 25°C)	$I_{S\ pulse}$	250	A
Recovery diode dv/dt [3]	dv/dt	50	V/ns
Maximum diode commutation speed	di_F/dt	900	A/μs
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C

1) Limited by Tj,max. Maximum Duty Cycle D = 0.50;
2) Pulse width tp limited by Tj,max
3) Identical low side and high side switch with identical RG

Thermal Resistance

Parameter	Symbol	Unit			Unit
		min.	typ.	max.	
Thermal resistance, junction – case	R_{thJC}		0.295	0.34	°C/W
Thermal resistance, junction – ambient	R_{thJA}		24.67	28.37	°C/W

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}	650	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	3	-	4.8	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	- -	- 1000	5 -	μA	V_{DS}=650V,V_{GS}=0V T_j=25°C T_j=150°C
Gate-source leakage current	I_{GSS}	-	-	±100	nA	V_{GS}=±30V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	41 110	50 -	mΩ	V_{GS}=10V, I_D=35A, T_j=25°C T_j=150°C
Transconductance	g_{fs}	-	44	-	S	V_{DS}=20V,I_D=35A
Dynamic Characteristic						
Input Capacitance	C_{iss}		6520		pF	V_{GS}=0V, V_{DS}=100V, f=1MHz
Output Capacitance	C_{oss}		260			
Reverse Transfer Capacitance	C_{rss}		2.4			
Gate Total Charge	Q_G		178		nC	V_{GS}=10V, V_{DS}=480V, I_D=35A
Gate-Source charge	Q_{gs}		56			
Gate plateau voltage	Q_{gd}		93			
Gate-Drain charge	$V_{plateau}$	-	8	-	V	
Turn-on delay time	$t_{d(on)}$	-	51	-	ns	V_{GS}=10V, I_D=35A, V_{DS}=400V, R_g=4.7Ω
Rise time	t_r	-	52	-		
Turn-off delay time	$t_{d(off)}$	-	112	-		
Fall time	t_f	-	9	-		
Gate resistance	R_G		1.2		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}	0.7	0.9	1.2	V	V_{GS}=0V,I_{SD}=35A
Body Diode Reverse Recovery Time	t_{rr}	-	195		ns	Isd=35A dI/dt=100A/us Vds=400V
Body Diode Reverse Recovery Charge	Q_{rr}	-	1.5		uC	
Body Diode Reverse Recovery Peak Current	I_{rrm}	-	15		A	

Typical Performance Characteristics

Fig 1. Output Characteristics (Tj=25℃)

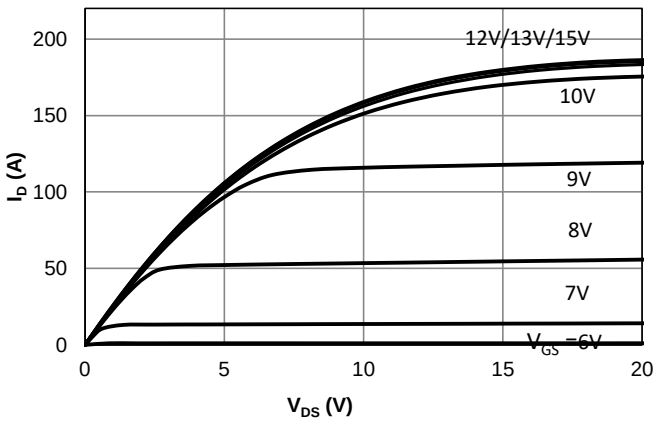


Fig 2. Output Characteristics (Tj=150℃)

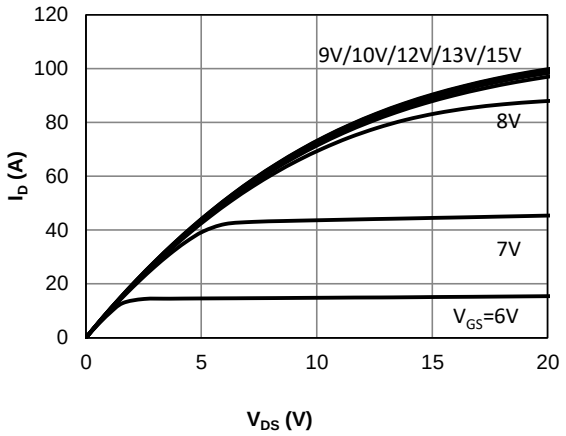


Fig 3: Transfer Characteristics

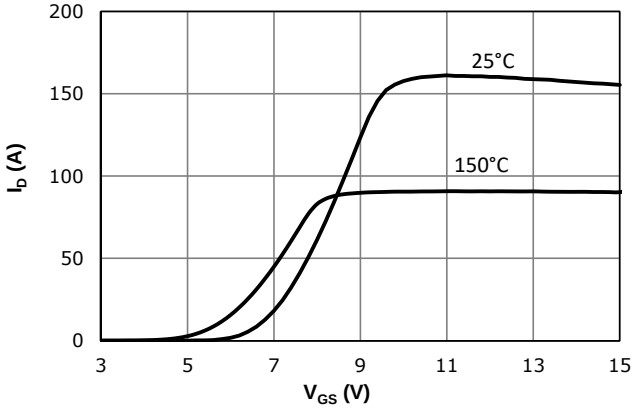


Fig 4: VGS(TH) Vs Tj Temperature Characteristics

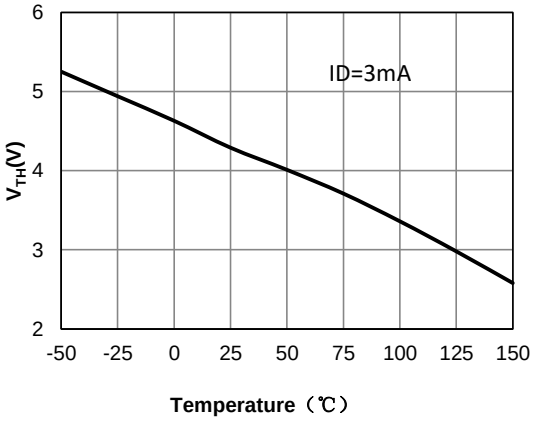


Fig 5: Rdson Vs Ids Characteristics(Tc=25℃)

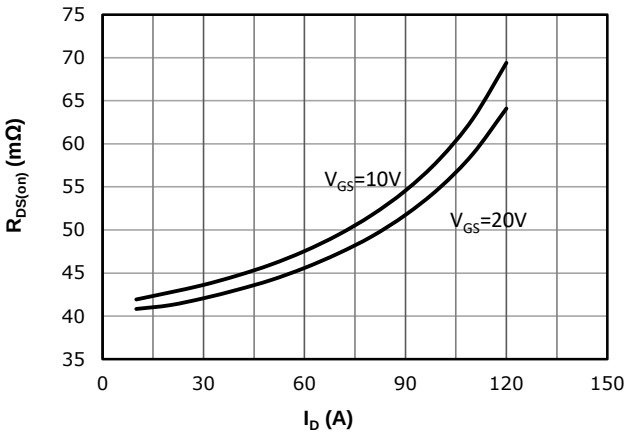


Fig 6: Rds(on) vs. Temperature

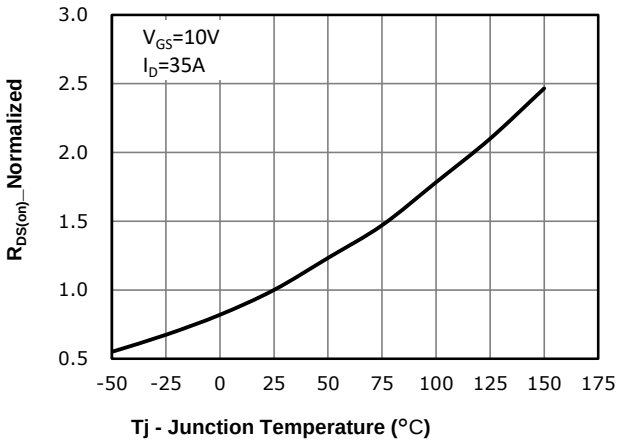


Fig 7: BVDSS vs. Temperature

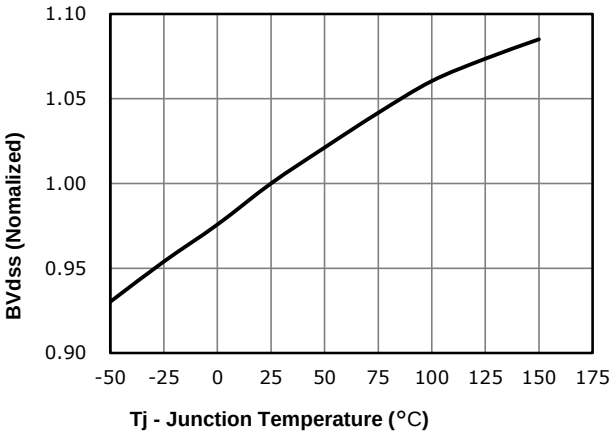


Fig 8: Rds(on) vs Gate Voltage

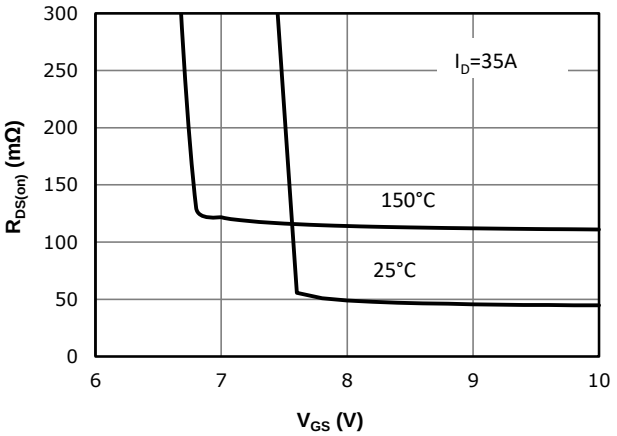


Fig 9: Body-diode Forward Characteristics

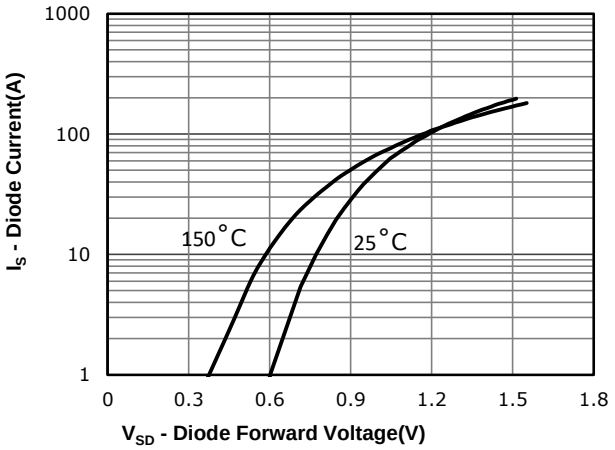


Fig 10: Gate Charge Characteristics

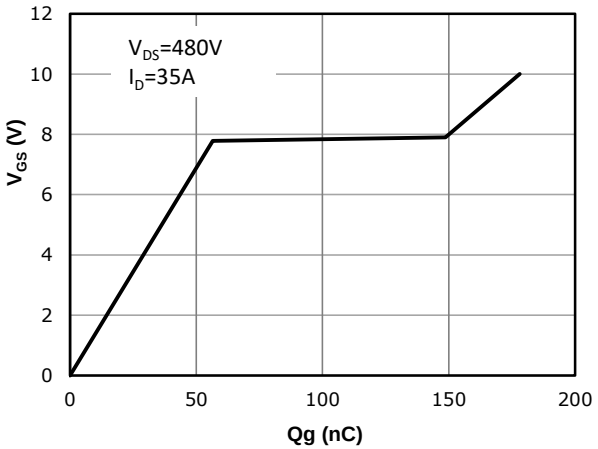


Fig 11: Capacitance Characteristics

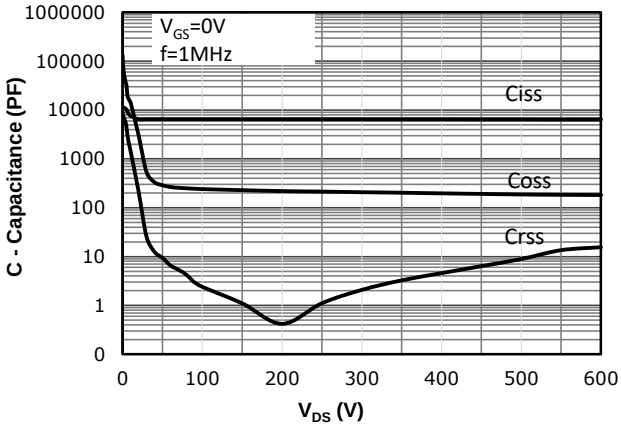


Fig 12: Safe Operating Area

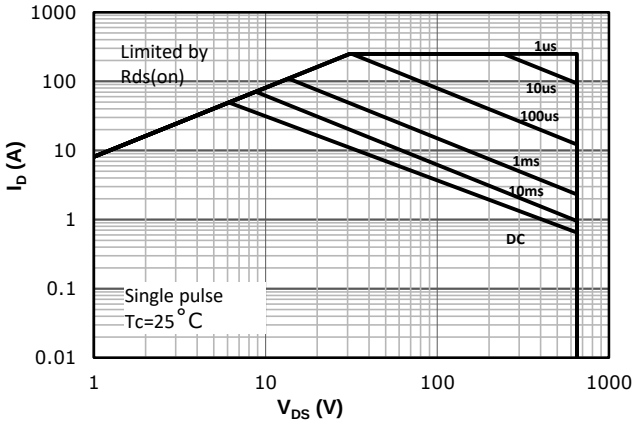
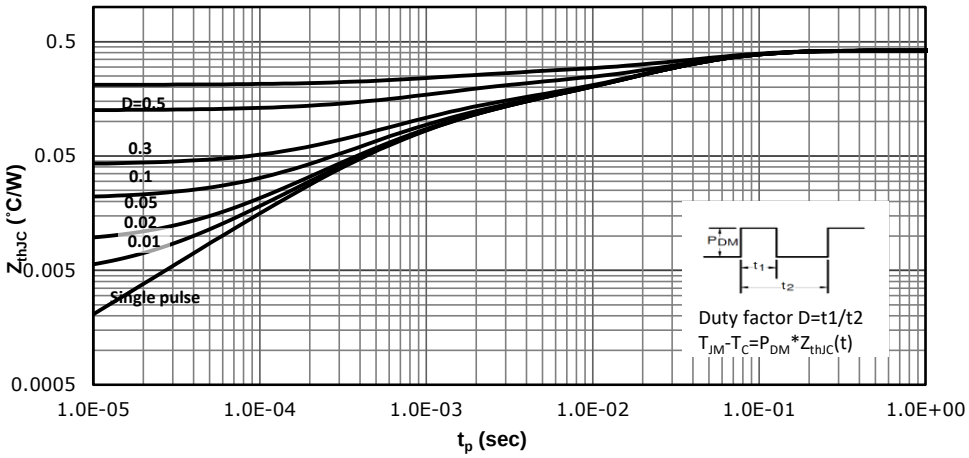
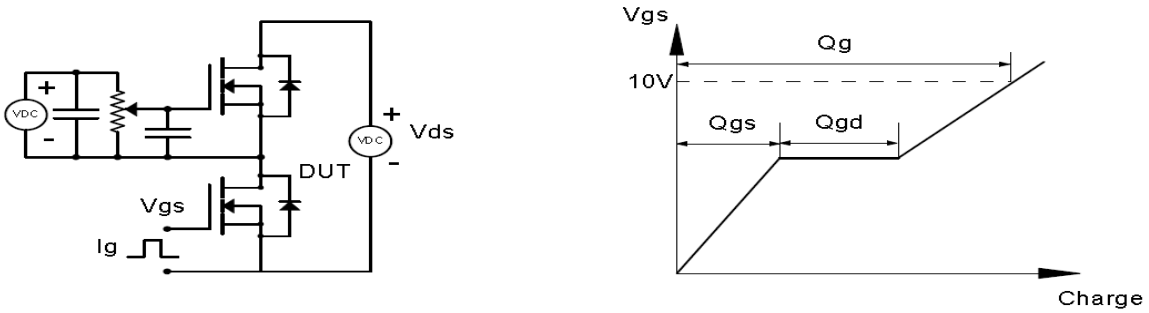


Fig 13: Max. Transient Thermal Impedance

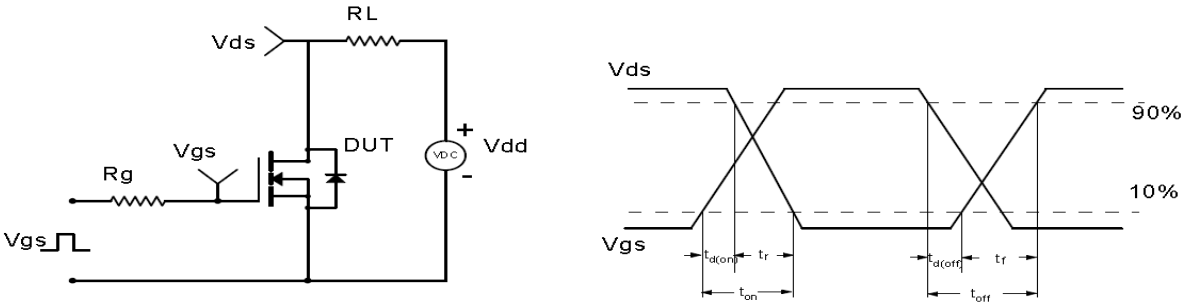


Test Circuit & Waveform

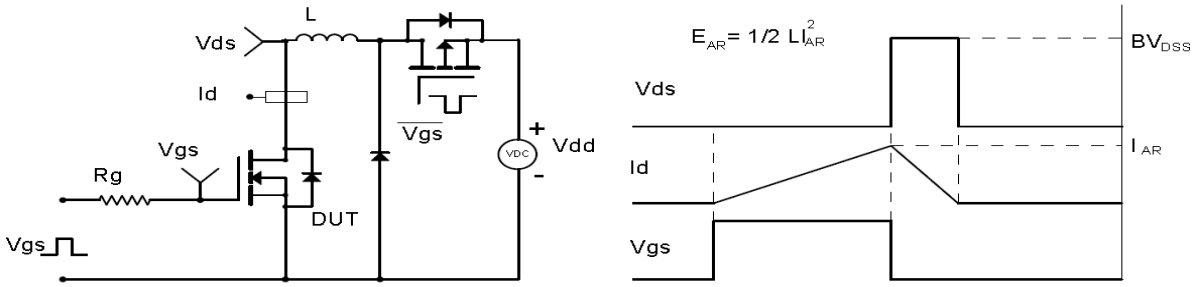
Gate Charge Test Circuit & Waveform



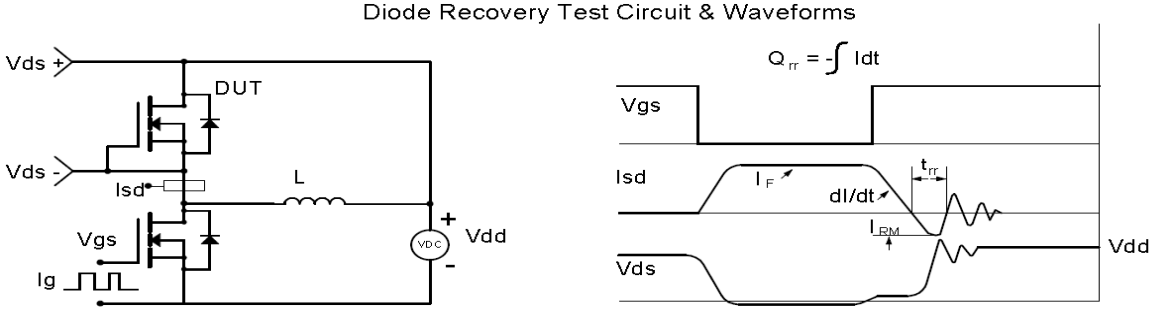
Resistive Switching Test Circuit & Waveforms



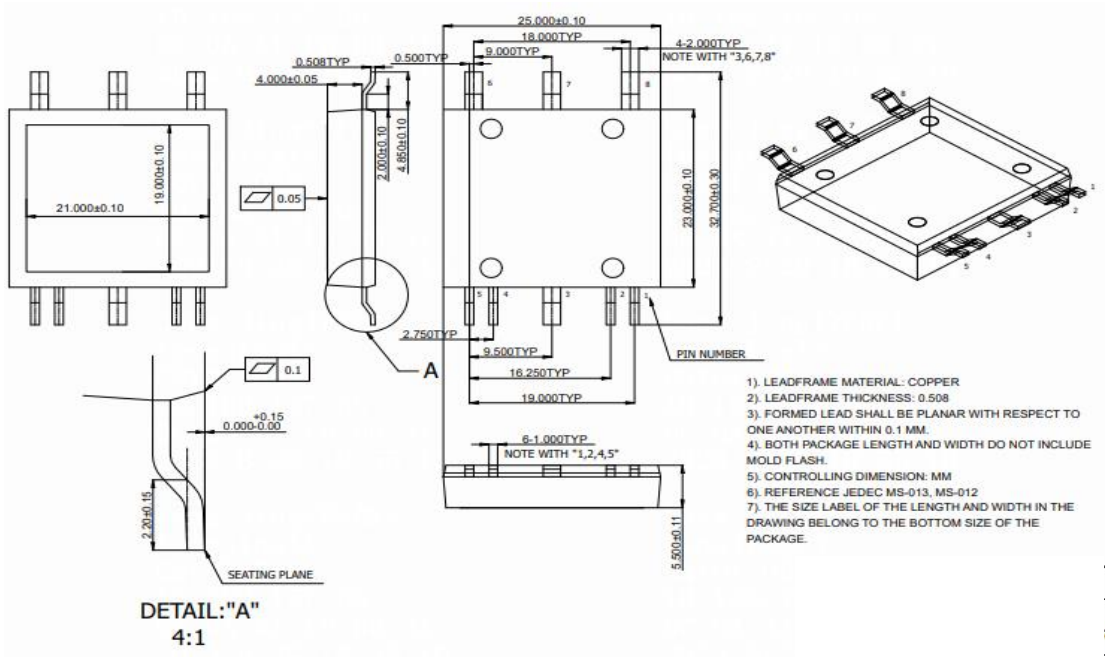
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline: MSOP8



Revision History

Revison	Major changes
V1.0	Initial release
V2.0	Notice AQG 324 qualified
V3.0	Update package

Disclaimer

CRM reserves the right to change any product or information in this Specification at any time without prior notice.

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