



650V 3.3 Ω N-Channel Power MOSFET

CMZ03S650KNH-252

Data Sheet

Version: V0.1

Features

- Originative New Design
- Superior Avalanche Rugged Technology
- Robust Gate Oxide Technology
- Very Low Intrinsic Capacitances
- Excellent Switching Characteristics
- Unrivalled Gate Charge : 22nC (Typ.)
- Extended Safe Operating Area

List of Contents

Features 3

List of Contents 4

1. Description..... 5

2. Product Summary 5

3. Pin Configuration..... 5

4. Absolute Ratings..... 6

5. Thermal Data/ Characteristics..... 6

6. Electrical Characteristics..... 7

7. Typical Electrical Characteristics..... 8

8. Package Information 10

1. Description

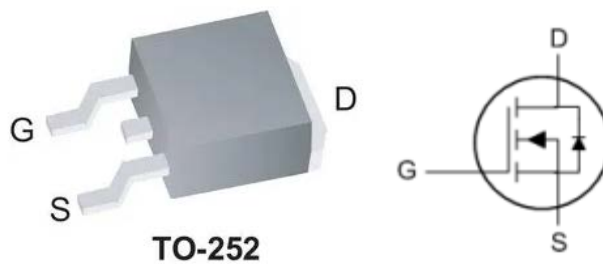
The CMZ03S650KNH-252 uses advanced MOSFET Technology, which provides high performance in on-state resistance, fast switching performance and excellent quality.

2. Product Summary

BVDSS	RDSON
650V	3.3Ω

- Switching Mode Power Supply
- Motor Drive
- Charger / Power Supply / UPS
- LED Display/ Environment Lighting
- Appliances and White Goods

3. Pin Configuration



4. Absolute Ratings

($T_A = 25^{\circ}\text{C}$ in a TO-252 package unless otherwise noted)

Parameter	Symbol	Value		Units
Drain-Source Voltage	V_{DS}	+650		V
Gate-Source Voltage	V_{GS}	± 30		V
Junction Temperature Maximum	T_{JMAX}	150		$^{\circ}\text{C}$
Storage Temperature	$T_{Storage}$	-55 to 150		$^{\circ}\text{C}$

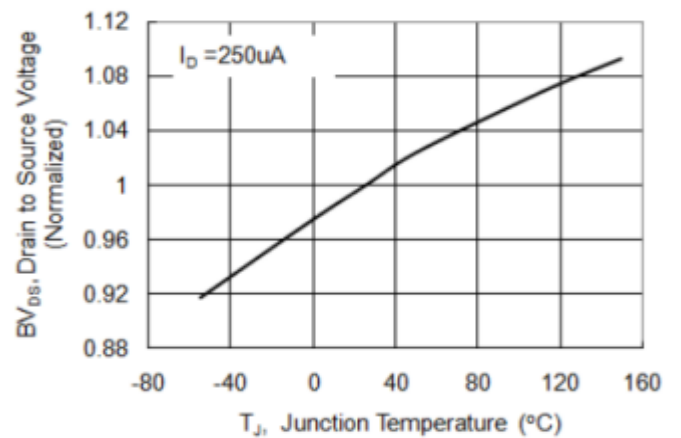
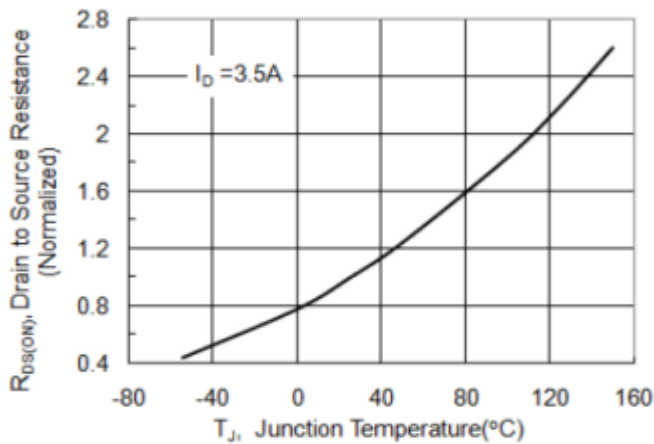
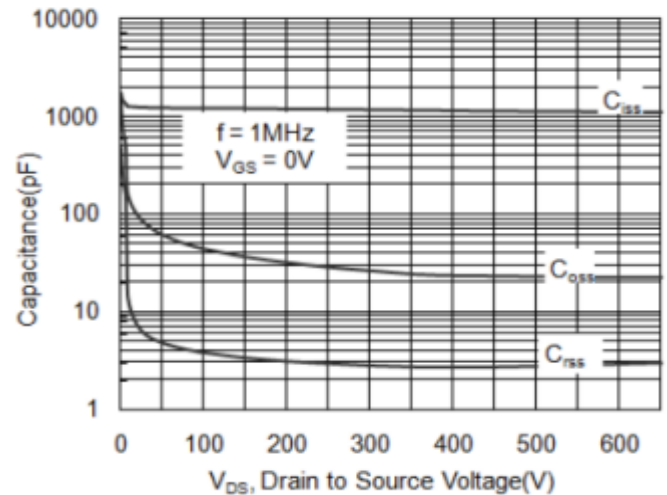
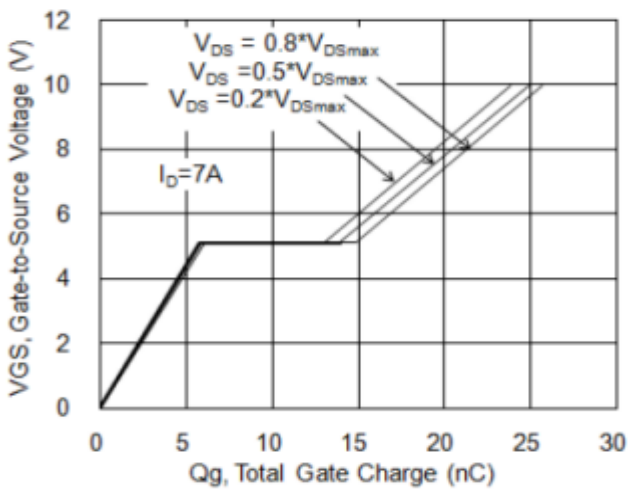
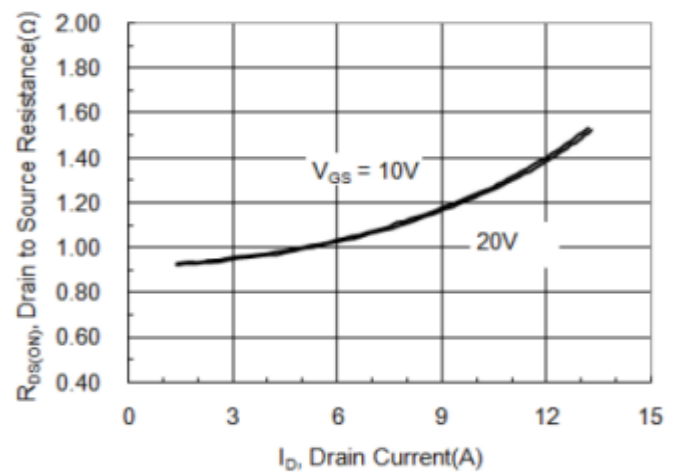
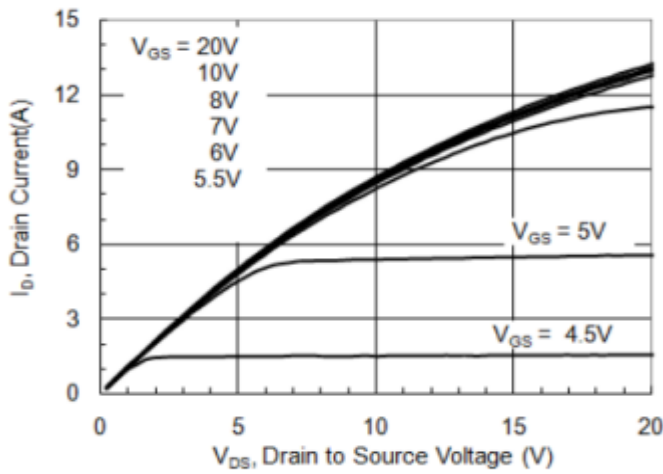
5. Thermal Data/ Characteristics

Parameter	Symbol	Value	Units
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	50	$^{\circ}\text{C}/\text{W}$

6. Electrical Characteristics

Static ($T_J=25^{\circ}\text{C}$ unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	650	---	---	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$	---	---	± 500	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 600V, V_{GS} = 0V$	---	---	1	μA
		$V_{DS} = 600V, V_{GS} = 0V, T_J = 125^{\circ}\text{C}$	---	---	10	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 1.5A$	---	3.3	3.7	Ω
		$V_{GS} = 8V, I_D = 1.5A$	---	---	4.1	
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.4	3	3.6	V
Diode Forward Voltage	V_{SD}	$I_S = 7.2A, V_{GS} = 0V$	---	---	1.4	V
Continuous Source Current	I_S	$V_{GS} = 0V, V_{DS} \text{Open}, f=1\text{MHz}$	---	---	3	A
Dynamic ($T_J=25^{\circ}\text{C}$ unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 400V, f = 250\text{kHz}$	---	208	---	pF
Output Capacitance	C_{oss}		---	10.8	---	
Reverse Transfer Capacitance	C_{rss}		---	3.6	---	
Total Gate Charge	Q_g	$V_{DS} = 520V, I_D = 7.2A, V_{GS} = 10V$	---	22	---	nC
Gate-Source Charge	Q_{gs}		---	5	---	
Gate-Drain Charge	Q_{gd}		---	9	---	
Turn-on delay time	$T_{d(on)}$	$V_{DS} = 325V, I_D = 7.2A, R_G=25\Omega$	---	17	---	nS
Rise time	T_r		---	61	---	
Turn-off delay time	$T_{d(off)}$		---	81	---	
Fall time	T_f		---	65	---	

7. Typical Electrical Characteristics



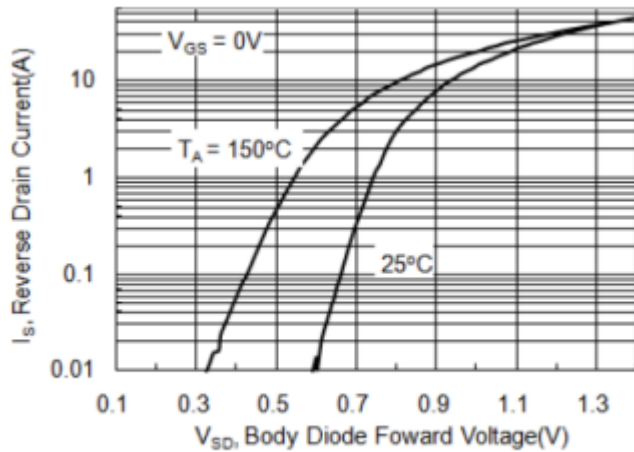


Fig 7. Forward characteristics of reverse diode

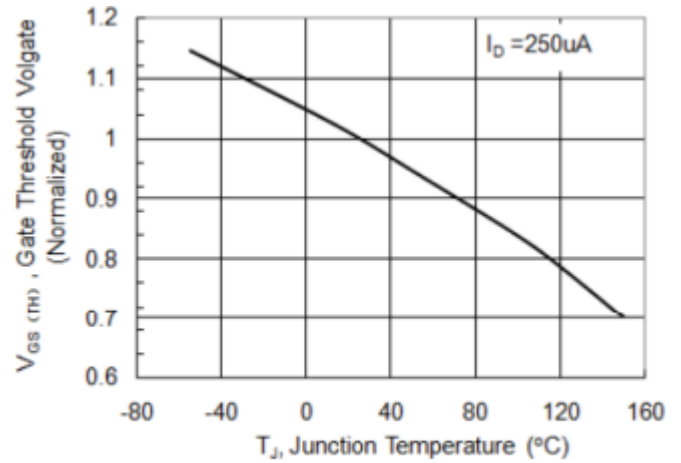


Fig 8. $V_{GS (TH)}$ vs junction temperature

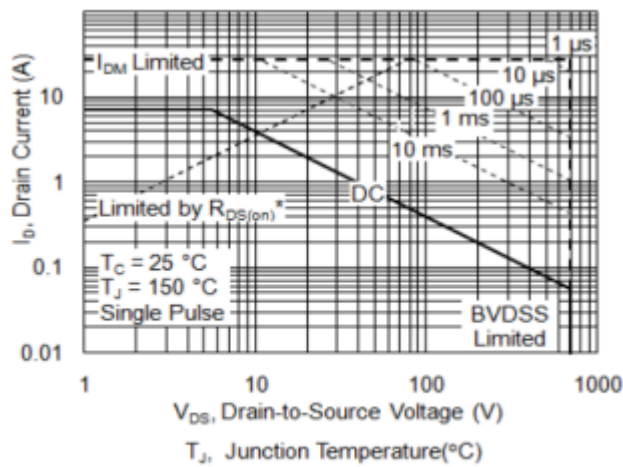
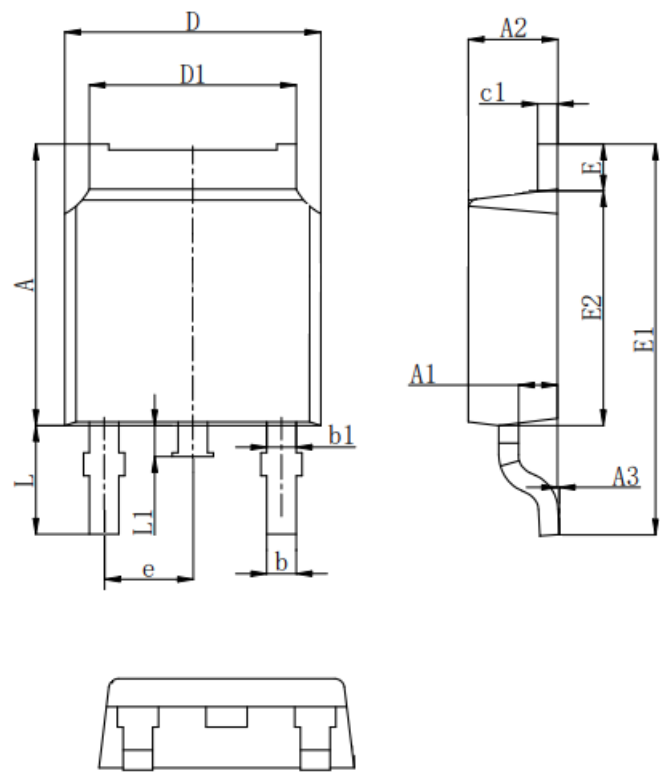


Fig 9. Safe operating area

8. Package Information

TO-252



Dimension	A	A1	A2	A3	b	b1	c1	D	D1	E	E1	E2	e	L	L1
Min.	7.05	0.96	2.25	0				6.55	5.22	0.95	9.7	6.05		2.65	0.7
Typ.	7.1	1.01	2.3	0.05	0.76	1	0.508	6.6	5.32	1	9.9	6.1	2.286	2.8	0.8
Max.	7.15	1.06	2.35	0.1				6.65	5.42	1.05	10.1	6.15		2.95	0.9