

General Description

The CMSA016N10 uses advanced SGT technology to provide excellent RDS (ON), low gate charge and minimize the loss of power conversion applications. This device is suitable to be used as the low side FET in SMPS, load switching and general purpose.

Features

- RDS(ON)<18mΩ @ VGS=10V
- 100% avalanche tested
- Small Footprint (5x6mm) for Compact Design
- Switching losses reduced

Absolute Maximum Ratings

Product Summary

BVDSS	RDS(ON)	ID
100V	18mΩ	45A

Applications

- DC/DC Converters in Computing, Servers, and POL
- Isolated DC/DC Converters in Telecom and Industrial

DFN-8 5x6 Pin Configuration



Type	Package	Marking
CMSA016N10	DFN-8 5*6	CMSA016N10

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_c=25^\circ\text{C}$	Continuous Drain Current	45	A
$I_D @ T_c=85^\circ\text{C}$	Continuous Drain Current	27	A
I_{DM}	Pulsed Drain Current	180	A
EAS	Single Pulse Avalanche Energy ¹	33	mJ
$P_D @ T_c=25^\circ\text{C}$	Total Power Dissipation	80	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient ²	---	22.7	°C/W
$R_{\theta JC}$	Thermal Resistance Junction -Case	---	1.5	°C/W

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_{\text{D}}=250\mu\text{A}$	100	---	---	V
$\text{R}_{\text{DS(ON)}}$	Static Drain-Source On-Resistance	$\text{V}_{\text{GS}}=10\text{V}$, $\text{I}_{\text{D}}=20\text{A}$	---	15.5	18	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}$, $\text{I}_{\text{D}}=15\text{A}$	---	21	25	
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}$, $\text{I}_{\text{D}}=250\mu\text{A}$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$\text{V}_{\text{DS}}=100\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$\text{V}_{\text{GS}}=\pm 20\text{V}$, $\text{V}_{\text{DS}}=0\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$\text{V}_{\text{DS}}=10\text{V}$, $\text{I}_{\text{D}}=20\text{A}$	---	19	---	S
R_{g}	Gate Resistance	$\text{V}_{\text{DS}}=0\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	3	---	Ω
Q_{g}	Total Gate Charge	$\text{V}_{\text{DD}}=50\text{V}$, $\text{I}_{\text{D}}=20\text{A}$	---	31	---	nC
Q_{gs}	Gate-Source Charge		---	6	---	
Q_{gd}	Gate-Drain Charge		---	5.1	---	
$\text{T}_{\text{d(on)}}$	Turn-On Delay Time	$\text{V}_{\text{DD}}=50\text{V}$, $\text{V}_{\text{GS}}=10\text{V}$, $\text{R}_{\text{G}}=3\Omega$	---	8	---	ns
T_{r}	Rise Time		---	11	---	
$\text{T}_{\text{d(off)}}$	Turn-Off Delay Time		---	26	---	
T_{f}	Fall Time		---	7.5	---	
C_{iss}	Input Capacitance	$\text{V}_{\text{DS}}=25\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	1000	---	pF
C_{oss}	Output Capacitance		---	500	---	
C_{rss}	Reverse Transfer Capacitance		---	75	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_{S}	Diode continuous forward current	$\text{V}_{\text{G}}=\text{V}_{\text{D}}=0\text{V}$, Force Current	---	---	45	A
$\text{I}_{\text{S,pulse}}$	Diode pulse current		---	---	180	A
V_{SD}	Diode Forward Voltage	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_{\text{S}}=20\text{A}$, $T_J=25^\circ\text{C}$	---	0.9	1.2	V

Notes:

- 1.The EAS data shows Max. rating . The test condition is $\text{V}_{\text{DD}}=50\text{V}$, $\text{V}_{\text{GS}}=10\text{V}$, $\text{L}=0.5\text{mH}$, $\text{I}_{\text{AS}}=11.6\text{A}$
2. Surface mounted FR-4 board by JEDEC (jesd51-7). Continuous current at $\text{TC}=25^\circ\text{C}$ is silicon limited

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