

General Description

The CMSA6248 uses trench MOSFET technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$, C_{iss} and C_{oss} . This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

Features

- $R_{DS(ON)} < 13m\Omega$ @ $V_{GS}=10V$
- 100% avalanche tested
- Small Footprint (5x6mm) for Compact Design
- RoHS Compliant

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current	55	A
I_{DM}	Pulsed Drain Current	165	A
I_{AS}	Single Pulse Avalanche Current	30	A
EAS	Single Pulse Avalanche Energy	108	mJ
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	70	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	---	55	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction -Case	---	1.8	$^\circ C/W$

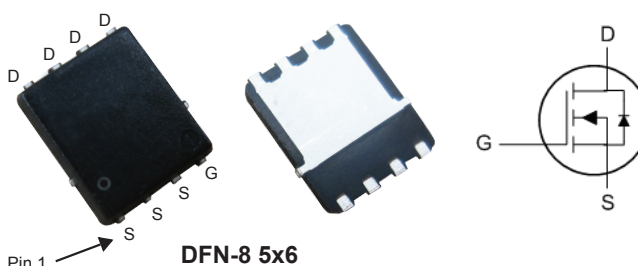
Product Summary

BVDSS	$R_{DS(ON)}$	ID
60V	13m Ω	55A

Applications

- DC-DC Converter
- Motor Drive
- Powertrain Management

DFN-8 5x6 Pin Configuration



Type	Package	Marking
CMSA6248	DFN-8 5*6	CMSA6248

N-Channel Enhancement Mode Field Effect Transistor

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=20A$	---	---	13	m Ω
		$V_{GS}=4.5V$, $I_D=20A$	---	---	16	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V$, $V_{GS}=0V$	---	---	1	μA
		$V_{DS}=60V$, $V_{GS}=0V$, $T_J=55^{\circ}\text{C}$	---	---	5	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{FS}	Forward Transconductance	$V_{DS}=5V$, $I_D=20A$	---	28	---	S
R_g	Gate resistance	$V_{GS}=0V$, $V_{DS}=0V$, $f=1\text{MHz}$	---	2	---	Ω
Q_g	Total Gate Charge	$V_{DS}=30V$, $I_D=20A$ $V_{GS}=10V$	---	20	---	nC
Q_{gs}	Gate-Source Charge		---	5	---	
Q_{gd}	Gate-Drain Charge		---	2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=30V$, $V_{GS}=10V$, $R_L=1.5\Omega$ $R_{GEN}=3\Omega$	---	5.5	---	ns
T_r	Rise Time		---	2.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	25	---	
T_f	Fall Time		---	2.5	---	
C_{iss}	Input Capacitance	$V_{DS}=30V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1600	---	pF
C_{oss}	Output Capacitance		---	165	---	
C_{rss}	Reverse Transfer Capacitance		---	10	---	

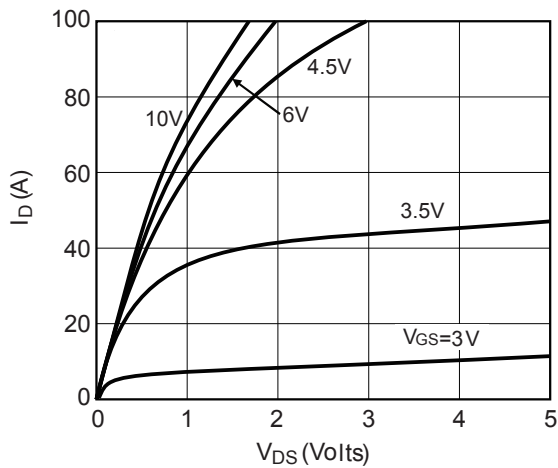
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	$V_G=V_D=0V$, Force Current	---	---	55	A
$I_{S,pulse}$	Diode pulse current		---	---	165	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=20A$, $T_J=25^{\circ}\text{C}$	---	---	1	V

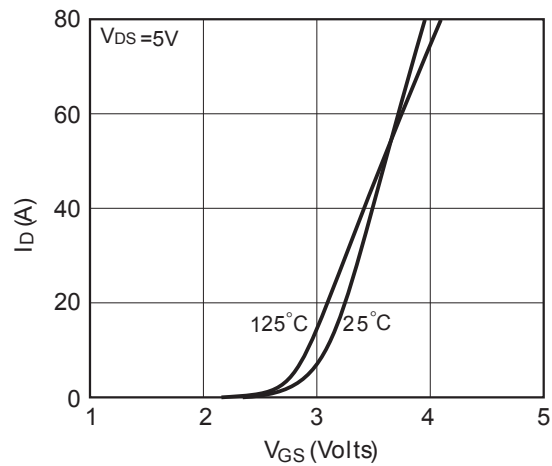
This product has been designed and qualified for the consumer market.
 Cmos assumes no liability for customers' product design or applications.
 Cmos reserves the right to improve product design, functions and reliability without notice.

Typical Characteristics

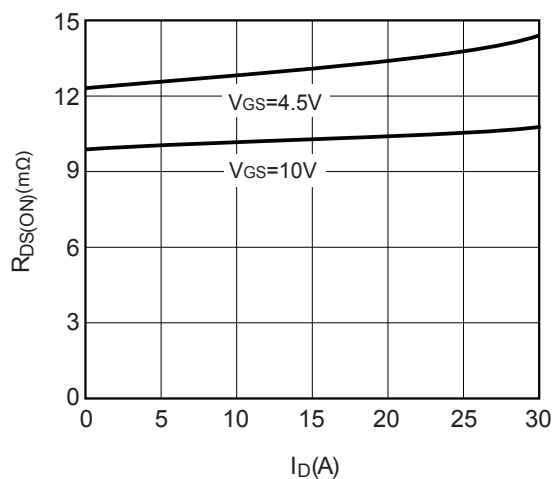
N-Channel Enhancement Mode Field Effect Transistor



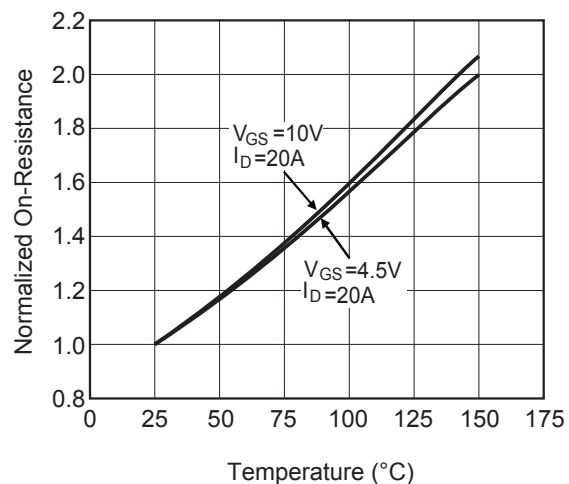
On-Region Characteristics



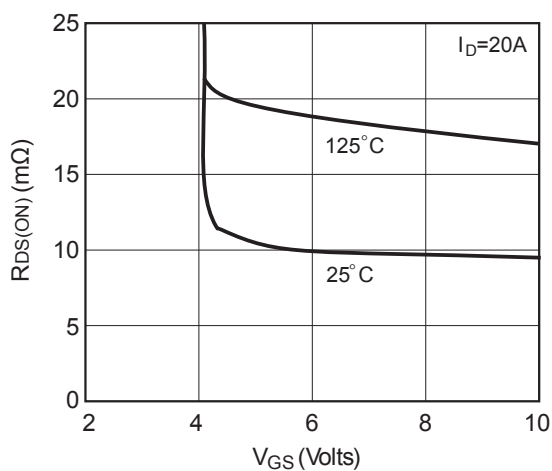
Transfer Characteristics



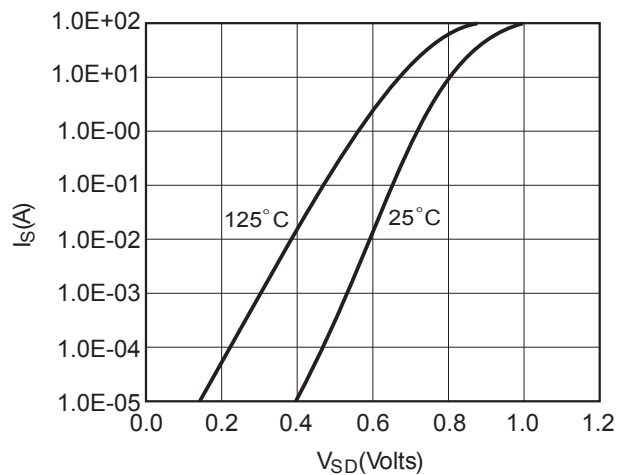
On-Resistance vs. Drain Current and Gate Voltage



On-Resistance vs. Junction Temperature



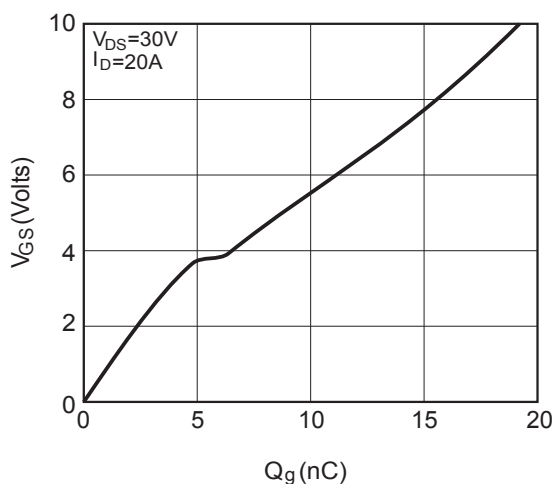
On-Resistance vs. Gate-Source Voltage



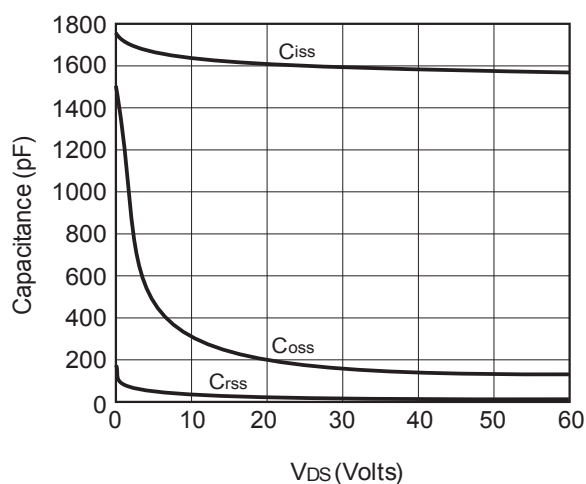
Body-Diode Characteristics

Typical Characteristics

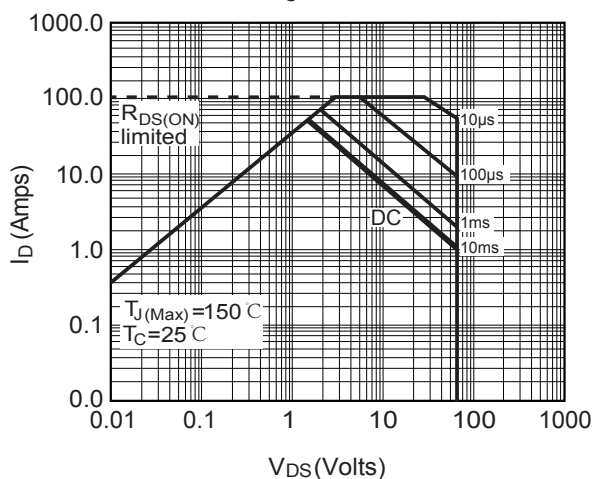
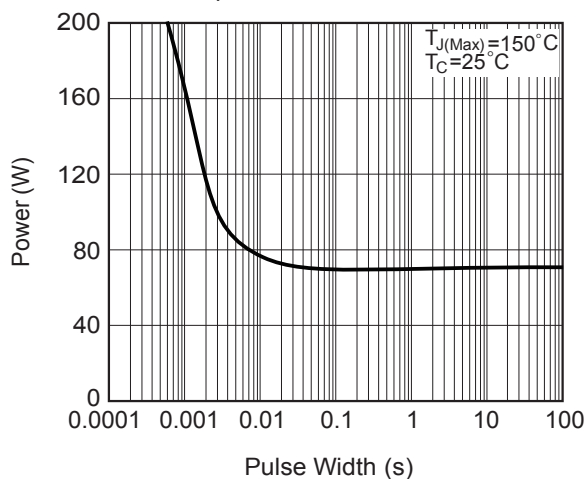
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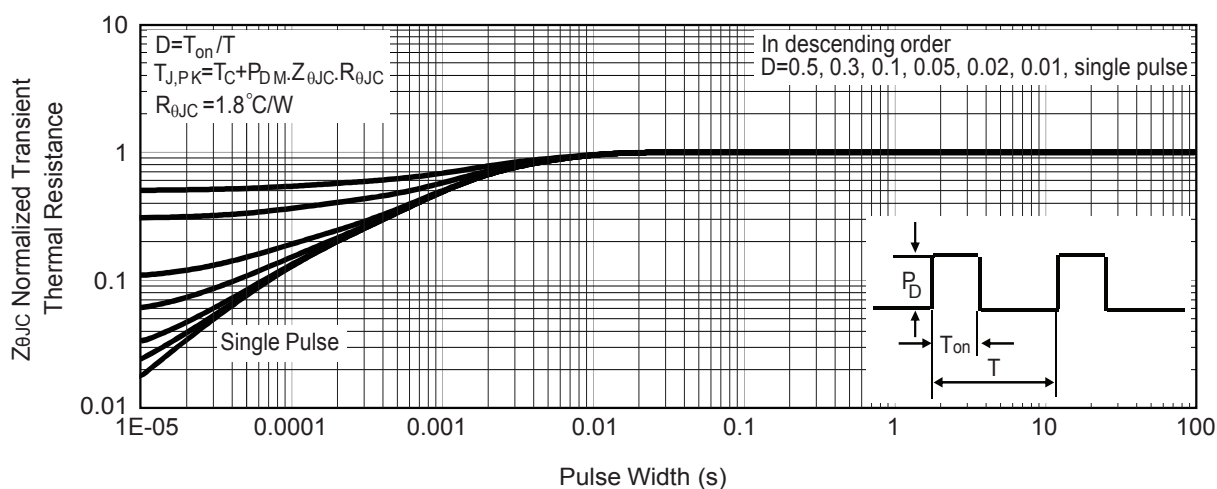
Gate-Charge Characteristics



Capacitance Characteristics

Maximum Forward Biased
Safe Operating Area

Single Pulse Power Rating Junction-to-Case



Normalized Maximum Transient Thermal Impedance

Typical Characteristics

N-Channel Enhancement Mode Field Effect Transistor

