

P-Channel Enhancement Mode Field Effect Transistor

General Description

The CMSA7405 uses advanced trench technology to provide excellent $R_{DS(ON)}$.

This device is suitable for use as a load switch or in PWM applications.

Features

- ESD Protected
- Lower On-resistance
- 100% EAS Guaranteed
- RoHS Compliant

Product Summary

BVDSS	RDSON	ID
-30V	6.5mΩ	-70A

Applications

- System/Load Switch
- Battery Switch

DFN-8 5x6 Pin Configuration



Type	Package	Marking
CMSA7405	DFN-8 5*6	CMSA7405

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	±25	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current	-70	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current	-56	A
I_{DM}	Pulsed Drain Current ¹	-210	A
EAS	Single Pulse Avalanche Energy ²	334	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	50	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
$R_{\theta JA}$	Junction-to-Ambient(Steady-State) ^{3,4}	---	50	°C/W
$R_{\theta JC}$	Junction-to-Case(Steady-State)	---	2.6	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{DS}=-10V$, $I_D=-20A$	---	5.5	6.5	$m\Omega$
		$V_{DS}=-4.5V$, $I_D=-10A$	---	10	15	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.5	-2.1	-3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-30V$, $V_{GS}=0V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 25V$, $V_{DS}=0V$	---	---	± 10	μA
g_{fs}	Forward Transconductance	$V_{DS}=-5V$, $I_D=-20A$	---	38	---	S
R_g	Gate Resistance	$V_{DS}=10V$, $V_{GS}=0V$, $f=1MHz$	---	4.5	---	Ω
Q_g	Total Gate Charge	$V_{DS}=-15V$, $I_D=-15A$ $V_{GS}=-10V$	---	47	---	nC
Q_{gs}	Gate-Source Charge		---	8	---	
Q_{gd}	Gate-Drain Charge		---	14	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=-15V$, $V_{GS}=-10V$ $R_{GEN}=3\Omega$, $R_L=1\Omega$	---	12	---	ns
T_r	Rise Time		---	10	---	
$T_{d(off)}$	Turn-Off Delay Time		---	54	---	
T_f	Fall Time		---	87	---	
C_{iss}	Input Capacitance	$V_{DS}=-25V$, $V_{GS}=0V$, $f=1MHz$	---	2600	---	pF
C_{oss}	Output Capacitance		---	500	---	
C_{rss}	Reverse Transfer Capacitance		---	360	---	

Diode Characteristics

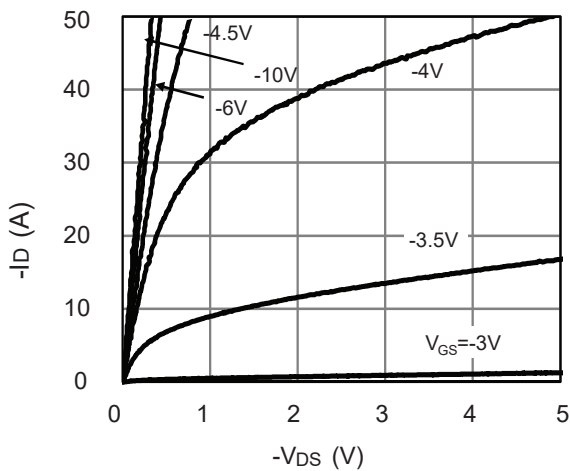
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-70	A
I_{SM}	Pulsed Source Current		---	---	-210	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=-28A$	---	-0.85	-1.2	V

Note :

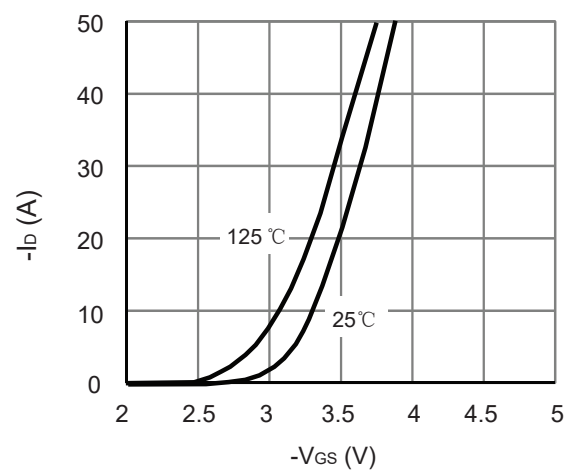
- 1: Repetitive rating, pulse width limited by junction temperature.
- 2: The EAS data shows Max. rating . The test condition is $V_{DD}=25V$, $V_{GS}=10V$, $L=0.5mH$, $I_{AS}=36.6A$.
- 3: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} \leq 10s$ and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.
- 4: The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

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Cmos reserves the right to improve product design ,functions and reliability without notice.

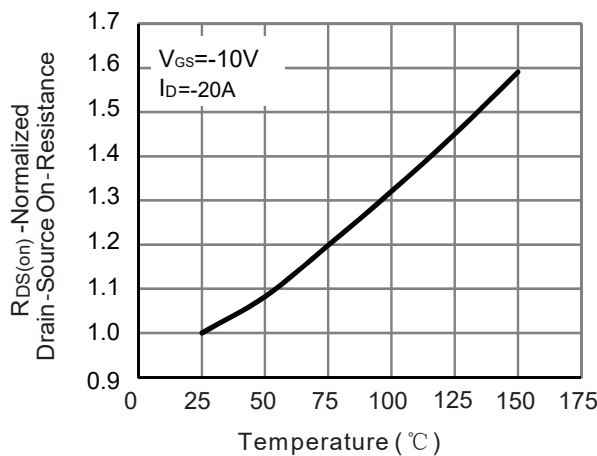
Typical Characteristics



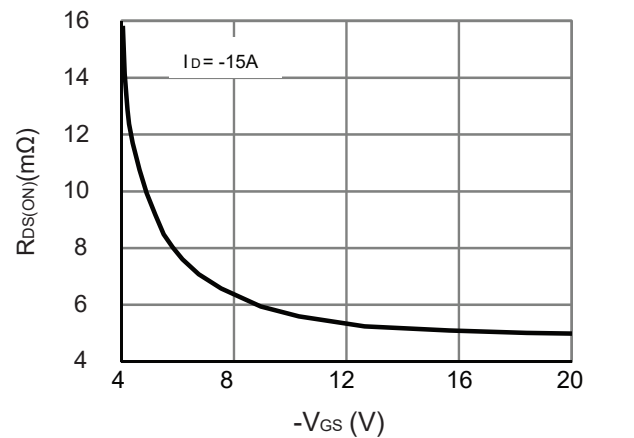
On-Region Characteristics



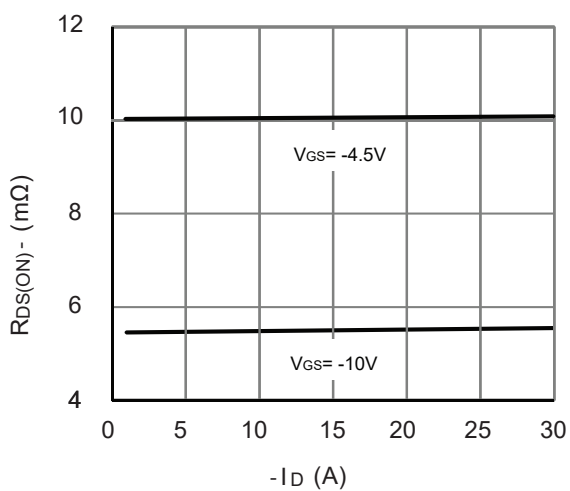
transfer characteristics



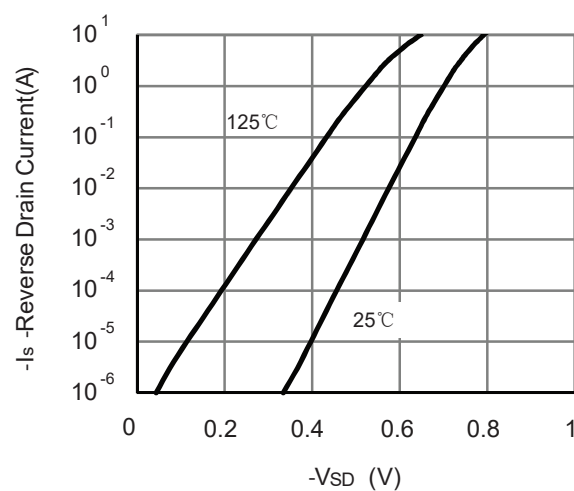
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-Source Voltage



On-Resistance VS. Drain Current



Body-Diode Characteristics

Typical Characteristics

