

General Description

These P-Channel enhancement mode power field effect transistors use advanced trench technology and design to provide excellent RDS(ON) . This device is suitable for use as a load switch or in PWM applications.

Features

- P-Channel MOSFET
- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

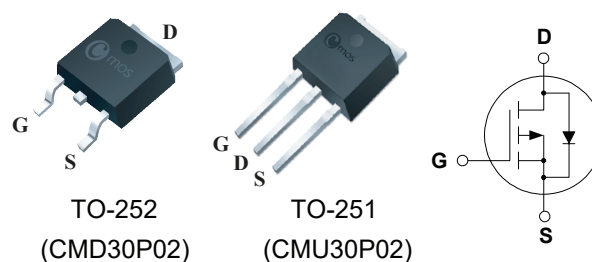
Product Summary

BVDSS	RDSON	ID
-20V	40mΩ	-30A

Applications

- DC-DC Converters
- Desktop PCs
- LED controller

TO-252/ 251 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current	-30	A
$I_D@T_C=75^\circ\text{C}$	Continuous Drain Current	-18	A
I_{DM}	Pulsed Drain Current	-120	A
EAS	Single Pulse Avalanche Energy ¹	42	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	40	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	110	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction -Case	---	4	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V$, $I_D=-6A$	---	30	40	$m\Omega$
		$V_{GS}=-2.5V$, $I_D=-4A$	---	50	90	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-0.5	---	-1.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-20V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	-1	μA
		$V_{DS}=-20V$, $V_{GS}=0V$, $T_J=125^{\circ}\text{C}$	---	---	-10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-5V$, $I_D=-10A$	---	14	---	S
R_g	Gate Resistance	$V_{DS}=10V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	22	---	Ω
Q_g	Total Gate Charge	$V_{DS}=-16V$, $V_{GS}=-4.5V$, $I_D=-8A$	---	15	---	nC
Q_{gs}	Gate-Source Charge		---	2.5	---	
Q_{gd}	Gate-Drain Charge		---	2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=-10V$, $V_{GS}=-4.5V$, $R_G=3.3\Omega$ $I_D=-8A$, $R_D=1.25\Omega$	---	15	---	ns
T_r	Rise Time		---	20	---	
$T_{d(off)}$	Turn-Off Delay Time		---	45	---	
T_f	Fall Time		---	27	---	
C_{iss}	Input Capacitance	$V_{DS}=-20V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	960	---	pF
C_{oss}	Output Capacitance		---	120	---	
C_{rss}	Reverse Transfer Capacitance		---	110	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_{GS}=V_{DS}=0V$, Force Current	---	---	-30	A
I_{SM}	Pulsed Source Current		---	---	-120	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=-5A$, $T_J=25^{\circ}\text{C}$	---	---	-1.3	V

Note :

1.The EAS data shows Max. rating . The test condition is $V_{DD}=-15V$, $V_{GS}=-10V$, $L=0.5\text{mH}$, $I_{AS}=-13A$

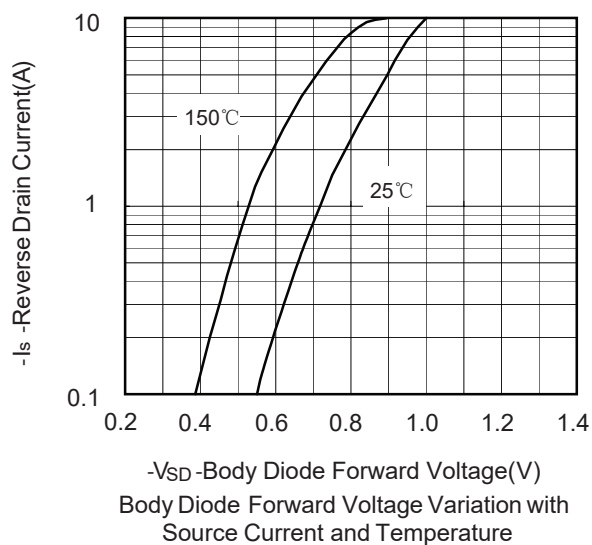
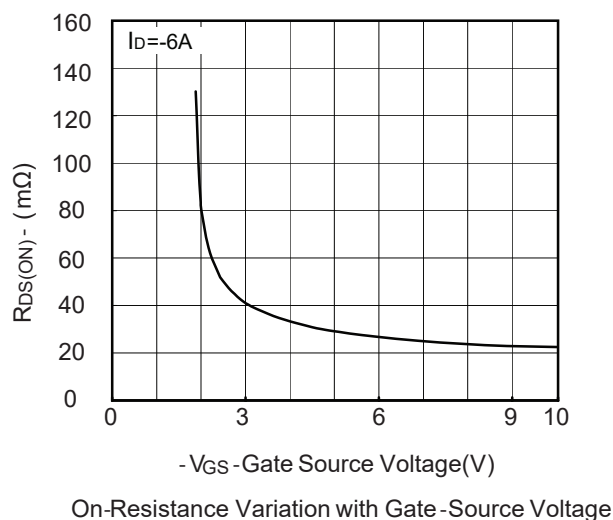
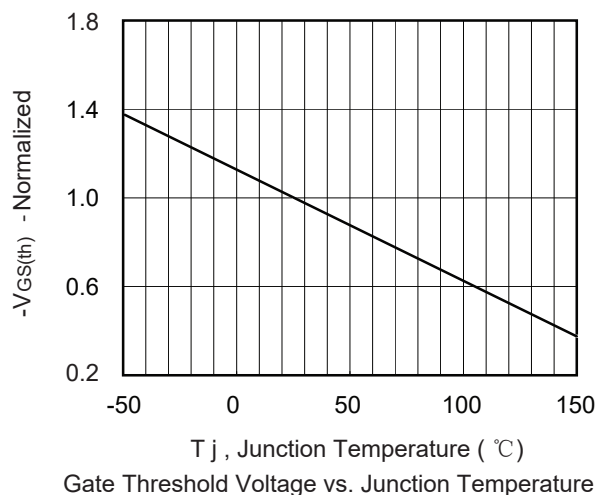
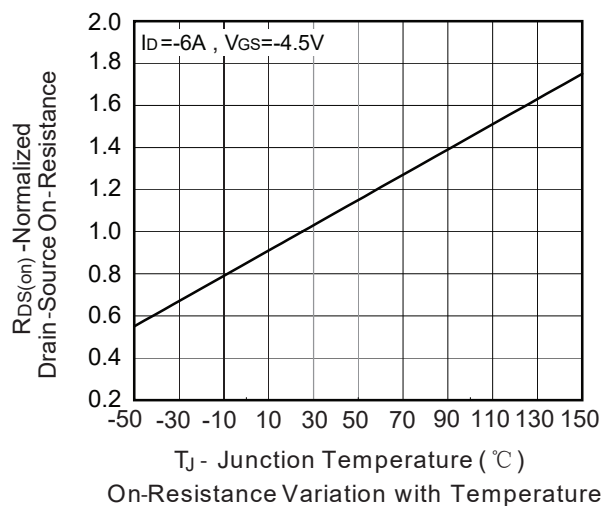
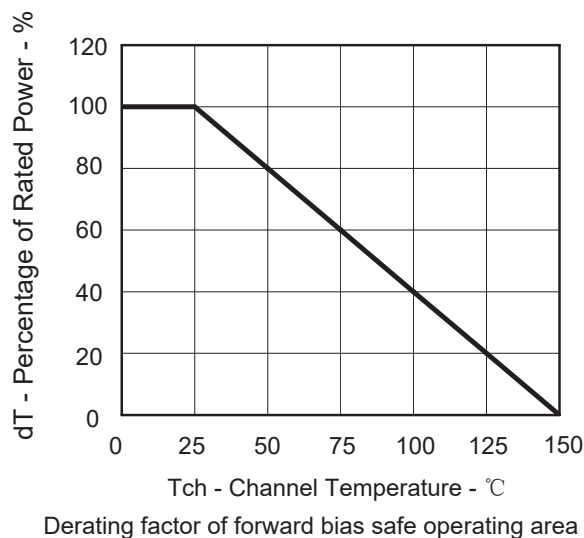
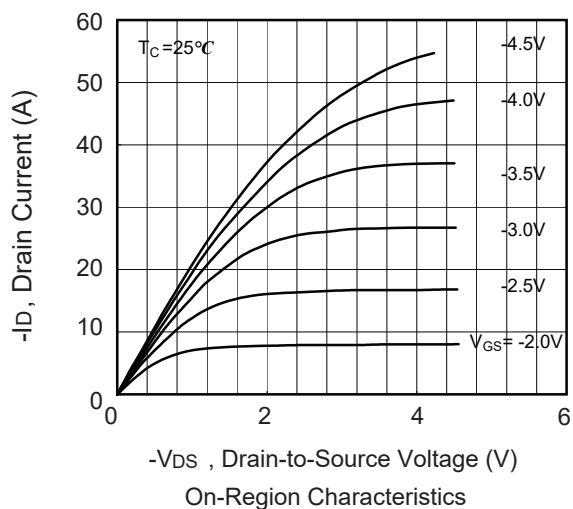
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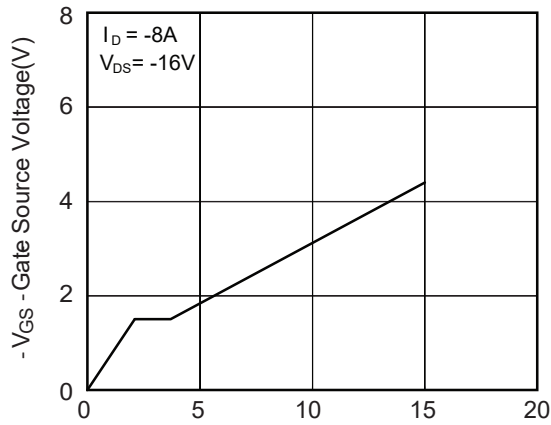
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Typical Characteristics

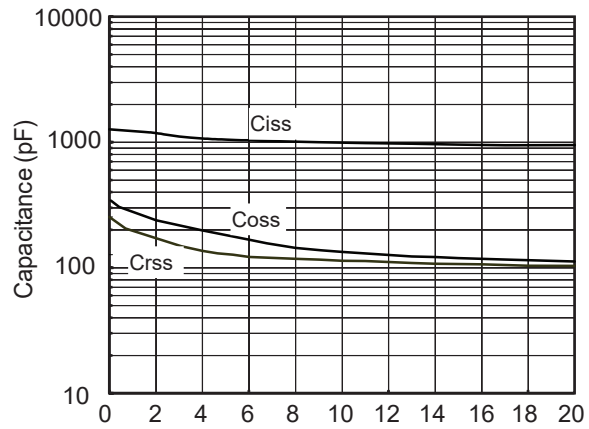
P-Channel 20-V (D-S) MOSFET



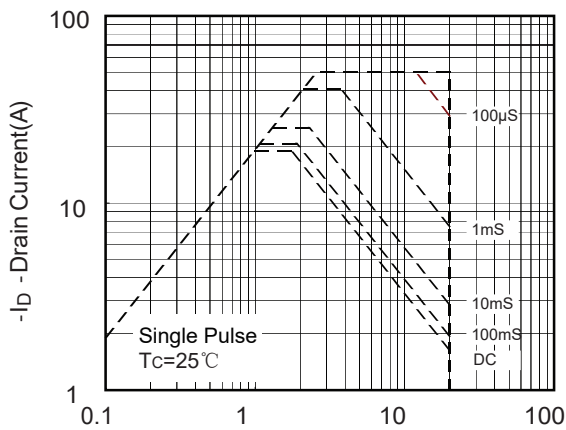
Typical Characteristics



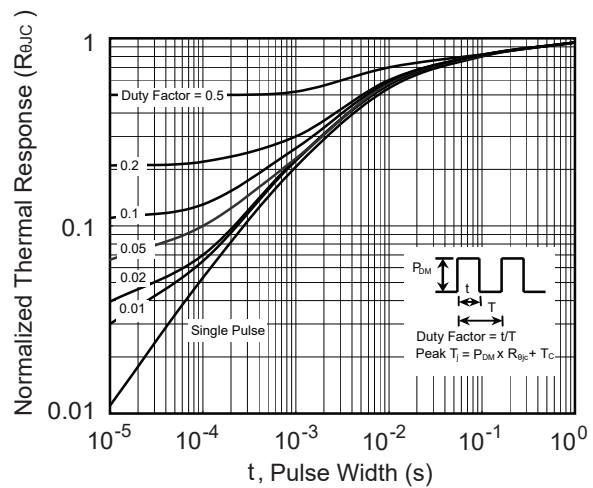
Qg - Gate charge (nC)
Gate Charge Characteristics



$-V_{DS}$, Drain-Source Voltage (V)
Capacitance Characteristics



$-V_{DS}$ - Drain-Source Voltage (V)
Maximum Safe Operating Area



Effective Transient Thermal Impedance