

General Description

This N-Channel MOSFET has been produced using advanced trench technology to deliver low RDS(on) and optimized BVDSS capability to offer superior performance benefit in the application

Features

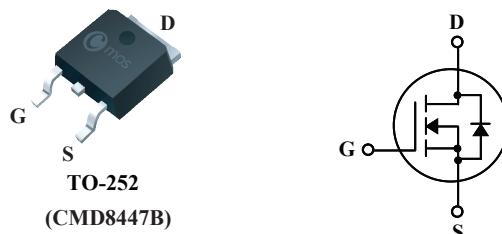
- Max $r_{DS(on)} = 15.5\text{m}\Omega$ at $V_{GS} = 10\text{V}$
- Max $r_{DS(on)} = 21\text{m}\Omega$ at $V_{GS} = 4.5\text{V}$
- Fast Switching
- RoHS Compliant

Absolute Maximum Ratings**Product Summary**

BVDSS	RDS(on)	ID
40V	15.5mΩ	50A

Applications

- Inverters
- Power Supplies

TO-252 Pin Configuration

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current	50	A
I_{DM}	Pulsed Drain Current	150	A
E_{AS}	Drain-Source Avalanche Energy ¹	100	mJ
$P_D @ T_C = 25^\circ\text{C}$	Total Power Dissipation	45	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	---	40	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	2.8	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_D=250\text{uA}$	40	---	---	V
$\text{R}_{\text{DS(ON)}}$	Static Drain-Source On-Resistance ²	$\text{V}_{\text{GS}}=10\text{V}$, $\text{I}_D=18\text{A}$	---	---	15.5	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}$, $\text{I}_D=15\text{A}$	---	---	21	
$\text{V}_{\text{GS(th)}}$	Gate Threshold Voltage	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}$, $\text{I}_D=250\text{uA}$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$\text{V}_{\text{DS}}=32\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$	---	---	1	uA
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 ²	$\text{V}_{\text{DS}}=10\text{V}$, $\text{I}_D=10\text{A}$	---	10	---	S
Q_{g}	Total Gate Charge	$\text{I}_D=25\text{A}$	---	18	---	nC
Q_{gs}	Gate-Source Charge	$\text{V}_{\text{DS}}=20\text{V}$	---	3	---	
Q_{gd}	Gate-Drain Charge	$\text{V}_{\text{GS}}=10\text{V}$	---	5	---	
$\text{T}_{\text{d(on)}}$	Turn-On Delay Time	$\text{V}_{\text{DS}}=20\text{V}$	---	8	---	ns
T_{r}	Rise Time	$\text{I}_D=25\text{A}$	---	15	---	
$\text{T}_{\text{d(off)}}$	Turn-Off Delay Time	$\text{R}_{\text{GEN}}=6\Omega$	---	32	---	
T_{f}	Fall Time	$\text{V}_{\text{GS}}=10\text{V}$	---	7	---	
C_{iss}	Input Capacitance	$\text{V}_{\text{DS}}=20\text{V}$, $\text{V}_{\text{GS}}=0\text{V}$, $\text{f}=1\text{MHz}$	---	1400	---	pF
C_{oss}	Output Capacitance		---	200	---	
C_{rss}	Reverse Transfer Capacitance		---	90	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
t_{rr}	Reverse Recovery Time	$\text{I}_F=25\text{A}$ $\text{di}/\text{dt}=100\text{A}/\mu\text{s}$	---	15	---	ns
Q_{rr}	Reverse Recovery Charge		---	30	---	nC
V_{SD}	Diode Forward Voltage ²	$\text{V}_{\text{GS}}=0\text{V}$, $\text{I}_S=1.8\text{ A}$	---	---	1.2	V

Notes:

- Starting $T_J = 25^\circ\text{C}$, $L = 0.5\text{mH}$, $\text{I}_D = 20\text{ A}$, $\text{V}_{\text{DD}} = 40\text{ V}$, $\text{V}_{\text{GS}} = 10\text{ V}$.
- Pulse Test: Pulse Width < 300 μs , Duty cycle < 2.0%.

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