

General Description

The 2054A combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDS(ON). This device is ideal for load switch and battery protection applications.

Features

- Simple Drive Requirement
- Ultra low On-Resistance.
- Green Device Available

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
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current	20	A
I_{DM}	Pulsed Drain Current ¹	90	A
EAS	Avalanche energy ⁴	36	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	---	105	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction -Case	---	2.73	$^\circ\text{C}/\text{W}$

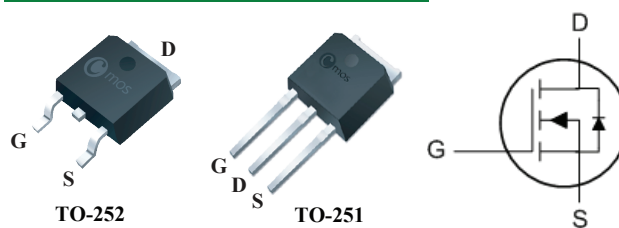
Product Summary

BVDSS	RDSON	ID
20V	17m Ω	30A

Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

TO-252/251 Pin Configuration



Type	Package	Marking
CMD2054A	TO-252	CMD2054A
CMU2054A	TO-251	CMU2054A

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	$V_{GS}=4.5V$, $I_D=6A$	---	---	17	m Ω
		$V_{GS}=2.5V$, $I_D=5A$	---	---	22	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.5	---	1.2	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=16V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance ²	$V_{DS}=5V$, $I_D=5A$	---	10	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2.0	---	Ω
Q_g	Total Gate Charge	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=12A$	---	4.5	---	nC
Q_{gs}	Gate-Source Charge		---	1.0	---	
Q_{gd}	Gate-Drain Charge		---	1.2	---	
$T_{d(on)}$	Turn-On Delay Time ³	$V_{DD}=10V$, $V_{GS}=4.5V$, $R_L=6\Omega$ $I_D=1.0A$, $R_G=6\Omega$	---	7	---	ns
T_r	Rise Time ³		---	11	---	
$T_{d(off)}$	Turn-Off Delay Time ³		---	28	---	
T_f	Fall Time ³		---	13	---	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	580	---	pF
C_{oss}	Output Capacitance		---	107	---	
C_{rss}	Reverse Transfer Capacitance		---	112	---	

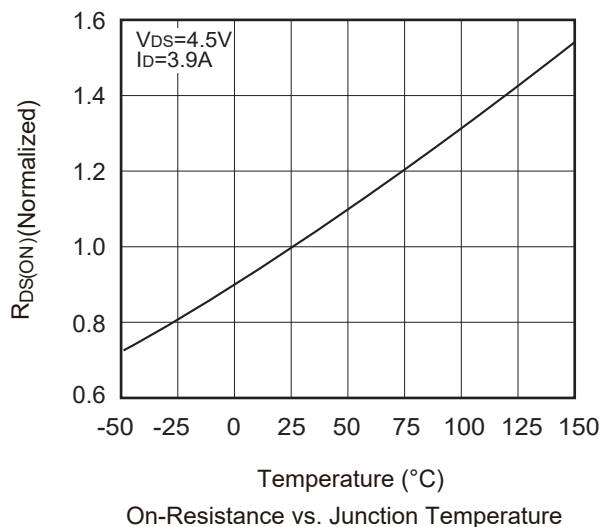
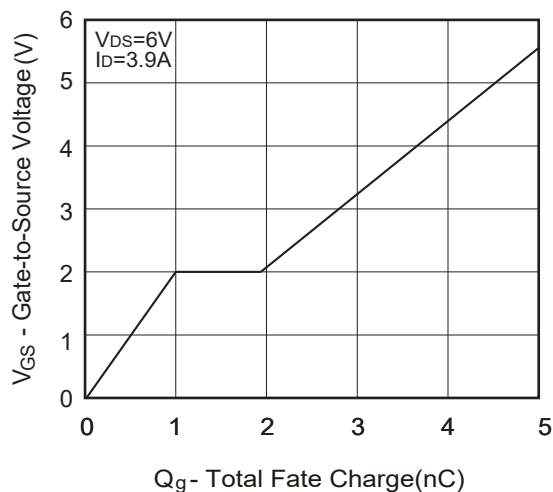
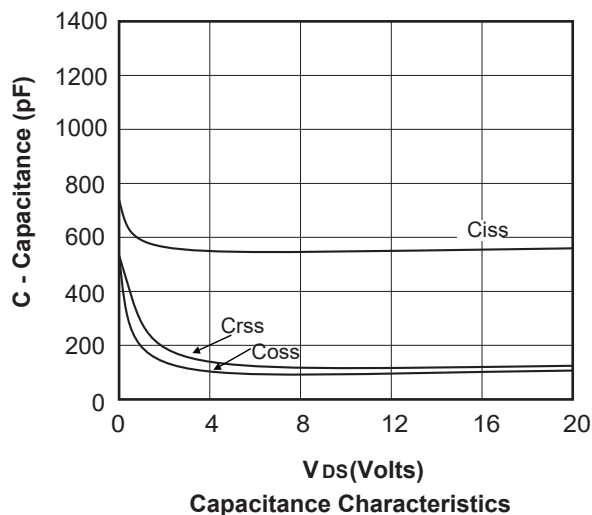
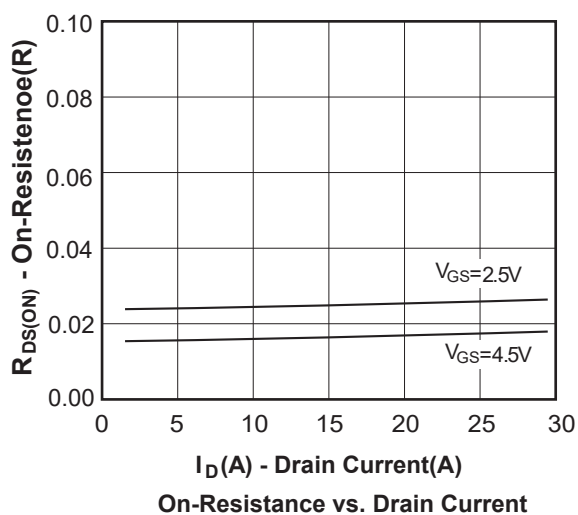
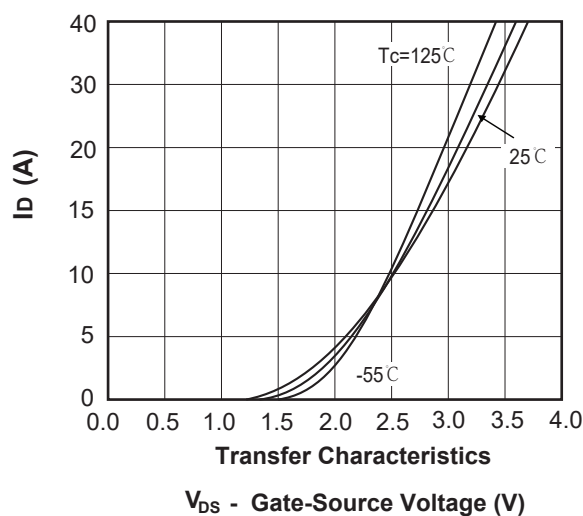
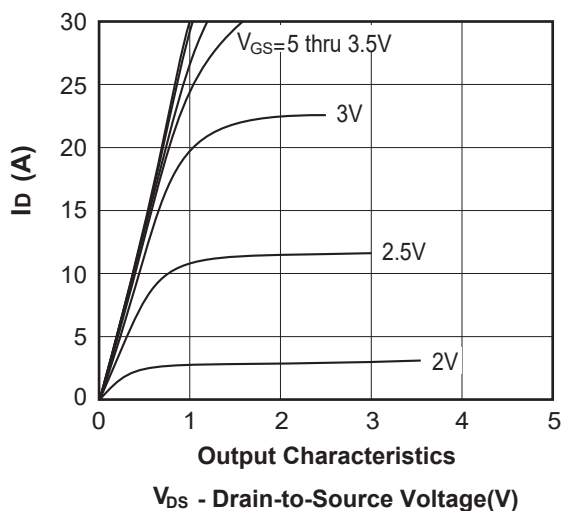
Diode Characteristics

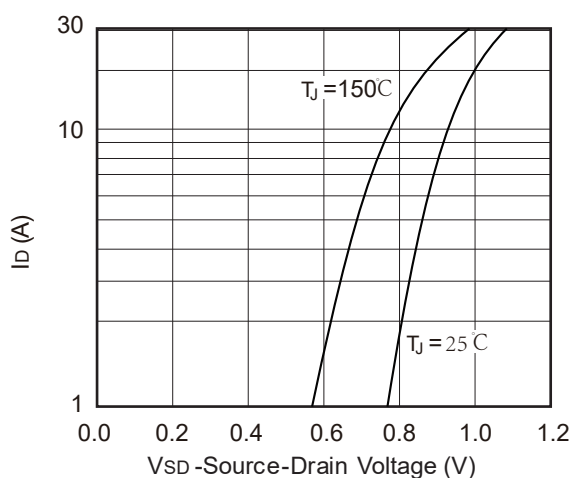
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=5A$	---	---	1.2	V

Note :

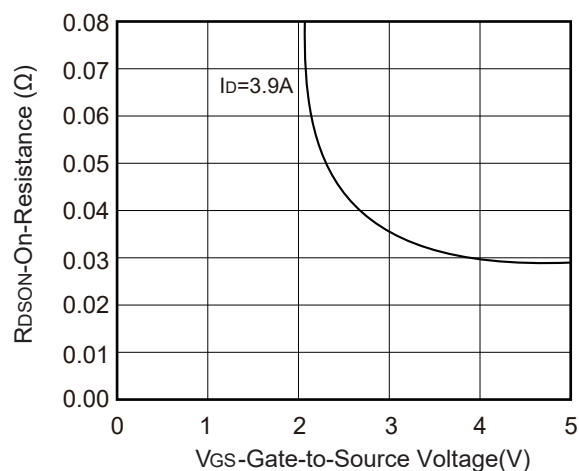
- 1.Pulse width limited by maximum junction temperature.
- 2.Pulse test : Pulse Width ≤ 300 usec, Duty Cycle $\leq 2\%$.
- 3.Independent of operating temperature.
- 4.The EAS data shows Max. rating . The test condition is $V_{DD}=15V$, $V_{GS}=10V$, $L=0.5\text{mH}$, $I_D=12A$

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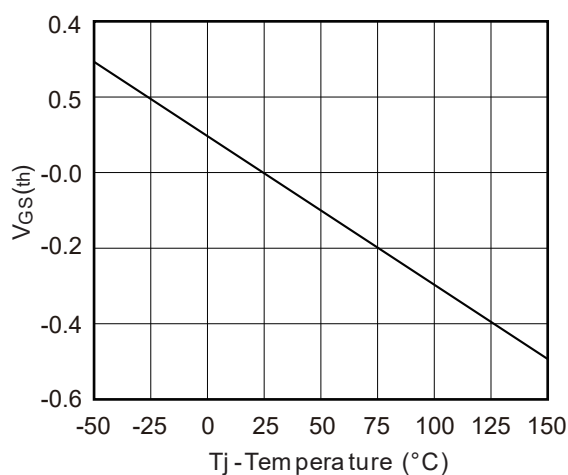




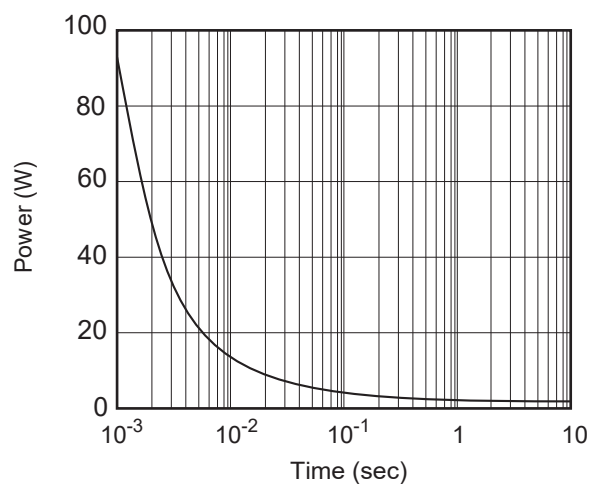
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power

