N-Channel and P-Channel 40V(D-S) MOSFET

Product summary			
V_{DS}	40	-40	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	9.9	19.2	mΩ
$R_{DS(ON)}$(at V_{GS}=4.5V) Typ.	13.5	24.2	mΩ
I_D(T_C=25℃)	34	-24	A

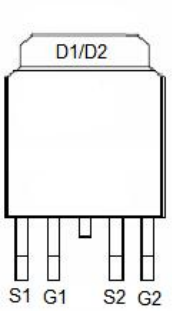
Features

- Low Gate Charge
- Advanced Trench Technology

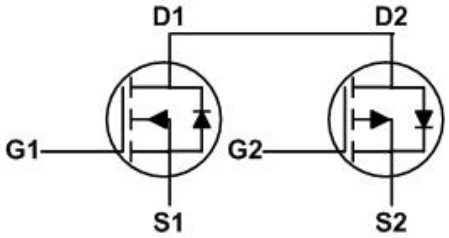
Applications

- Power management functions
- PWM Application
- Load switch

Pin Configuration



TO252-4



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECFD30C04	TO252-4	13″	2500pcs

Absolute Maximum Ratings (at T_A=25℃ Unless Otherwise Noted)

Symbol	Parameter		N-Rating	P-Rating	Units
V_{DS}	Drain-Source Voltage		40	-40	V
V_{GS}	Gate-Source Voltage		±20	±20	V
I_D	Continuous Drain Current	T_C=25℃	34	-24	A
		T_C=100℃	21.5	-15.2	A
I_{DM}	Pulse Drain Current Tested [A]		134	-95	A
E_{AS}	Single Pulse Avalanche Energy [B]		33	42	mJ
P_D	Power Dissipation	T_C=25℃	25	25	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JC}$	Thermal Resistance Junction-Case	5	℃/W

N-Channel Electrical Characteristics (at T_J =25°C Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V,V_{GS}=0V	--	--	1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.0	1.5	2.2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [C]	V_{GS}=10V,I_D=10A	--	9.9	12.6	mΩ
		V_{GS}=4.5V,I_D=5A	--	13.5	17	mΩ
V_{SD}	Diode Forward Voltage	I_S=10A,V_{GS}=0V	--	--	1.2	V
I_S	Maximum Body-Diode Continuous Current		--	--	34	A
Dynamic Parameters [D]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=20V f=1MHZ	--	1210	--	pF
C_{oss}	Output Capacitance		--	85	--	pF
C_{rss}	Reverse Transfer Capacitance		--	56	--	pF
Q_g	Total Gate Charge	V_{DS}=20V,I_D=10A V_{GS}=0 to 10V	--	27	--	nC
Q_{gs}	Gate-Source Charge		--	8	--	nC
Q_{gd}	Gate-Drain Charge		--	6	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=20V I_D=10A,R_{GEN}=3Ω, V_{GS}=10V	--	7.8	--	ns
t_r	Turn-on Rise Time		--	12.3	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	27.5	--	ns
t_f	Turn-off Fall Time		--	6.9	--	ns
t_{rr}	Reverse Recovery Time	I_F=10A di/dt=100A/us	--	11	--	ns
Q_{rr}	Reverse Recovery Charge		--	7	--	nC

A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. The E_{AS} data shows Max. rating . The test condition is TJ=25℃,V_{DD}=20V,R_G=25ohm,V_G=10V,L=0.5mH,I_{AS}=11.5A.

C. Pulse Test: Pulse Width≤300us,Duty cycle ≤0.5%.

D. Guaranteed by design, not subject to production testing.

P-Channel Electrical Characteristics (at T_J =25℃ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=-250uA	-40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-40V,V_{GS}=0V	--	--	-1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±20V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-1.0	-1.7	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [C]	V_{GS}=-10V,I_D=-5A	--	19.2	25	mΩ
		V_{GS}=-4.5V,I_D=-4A	--	24.2	31.5	mΩ
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V	--	--	-1.0	V
I_S	Maximum Body-Diode Continuous Current		--	--	-24	A
Dynamic Parameters [D]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-20V f=1MHZ	--	1436	--	pF
C_{oss}	Output Capacitance		--	122	--	pF
C_{rss}	Reverse Transfer Capacitance		--	85	--	pF
Q_g	Total Gate Charge	V_{DS}=-20V,I_D=-10A V_{GS}=0 to -10V	--	28	--	nC
Q_{gs}	Gate-Source Charge		--	7	--	nC
Q_{gd}	Gate-Drain Charge		--	5.5	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=-20V I_D=-10A,R_{GEN}=3Ω, V_{GS}=-10V	--	7.8	--	ns
t_r	Turn-on Rise Time		--	29	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	36	--	ns
t_f	Turn-off Fall Time		--	47	--	ns
t_{rr}	Reverse Recovery Time	I_F=-10A di/dt=100A/us	--	14	--	ns
Q_{rr}	Reverse Recovery Charge		--	7	--	nC

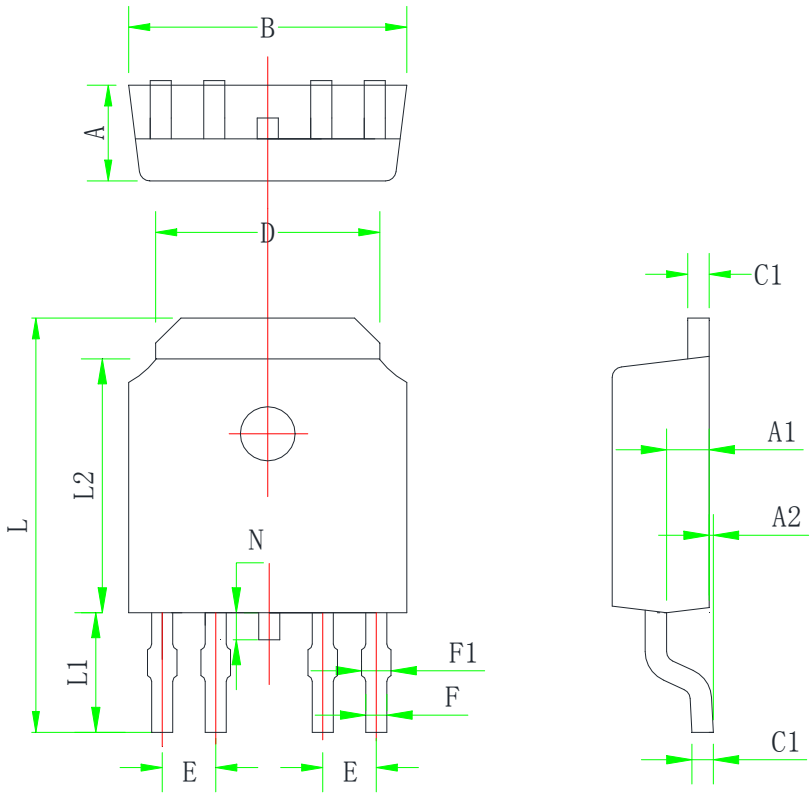
A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. The E_{AS} data shows Max. rating . The test condition is TJ=25℃,V_{DD}=-20V,R_G=25ohm,V_G=-10V,L=0.5mH,I_{AS}=-13A.

C. Pulse Test: Pulse Width≤300us,Duty cycle ≤0.5%.

D. Guaranteed by design, not subject to production testing.

TO252-4L Package Information



Symbol	Min	Typ	Max
A	2.20	2.30	2.40
A1	0.91	1.01	1.11
A2	0.05	0.15	0.25
B	6.45	6.60	6.75
C	0.45	0.50	0.58
C1	0.45	0.50	0.58
D	5.12	5.32	5.52
E		1.27 TYP	
F	0.45	0.60	0.75
F1	0.40	0.50	0.60
L	9.70	10.00	10.20
L1	2.6	2.8	3.0
L2	5.95	6.10	6.25
N	0.45	0.65	0.85