P-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	-30	V
$R_{DS(ON)}$(at V_{GS}=-10V) Typ.	9.8	mΩ
$R_{DS(ON)}$(at V_{GS}=-4.5V) Typ.	15.5	mΩ
I_D(Tc=25℃)	-40	A

Features

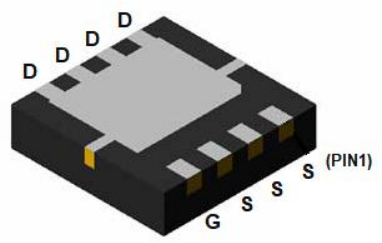
- Trench Power LV MOSFET technology
- High Speed switching

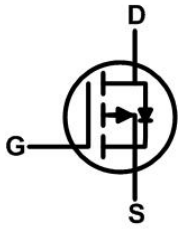
Applications

- Load switching
- High current load applications
- Uninterruptible power supply

Pin Configuration

DFN3.3X3.3-8L





Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAL40P03S	DFN3.3X3.3-8L	13″	5000pcs

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

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		-30	V
V_{GS}	Gate-Source Voltage		±25	V
I_D	Continuous Drain Current [A]	T_C=25℃	-40	A
		T_C=70℃	-33	A
I_{DM}	Pulse Drain Current Tested [B]		-160	A
E_{AS}	Single Pulse Avalanche Energy [C]		72	mJ
P_D	Power Dissipation [D]	T_C=25℃	32	W
T_J,T_{STG}	Junciton and Storage Temperature Range		-55 to +150	℃

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JC}$	Thermal Resistance-Junction to case max [A]	3.9	℃/W

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	-30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-30V,V_{GS}=0V	--	--	-1	uA
I_{GSS}	Gate-Body Leakage Current	V_{DS}=0V,V_{GS}=±25V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	-1.2	-1.8	-2.8	V
$R_{DS(ON)}$	Drain-Source On-State Resistance [B]	V_{GS}=-10V,I_D=-15A	--	9.8	15	mΩ
		V_{GS}=-6V,I_D=-12A	--	12.1	22	mΩ
		V_{GS}=-4.5V,I_D=-10A	--	15.5	25	mΩ
V_{SD}	Diode Forward Voltage [B]	I_S=-20A,V_{GS}=0V	--	--	-1.2	V
Dynamic Parameters [E]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=-15V f=1MHZ	--	2152	--	pF
C_{oss}	Output Capacitance		--	308	--	pF
C_{rss}	Reverse Transfer Capacitance		--	242	--	pF
Rg	Gate Resistance	f=1MHZ	--	--	20	Ω
Q_g	Total Gate Charge	V_{DS}=-15V,I_D=-12A V_{GS}=-10V	--	40.1	--	nC
Q_{gs}	Gate-Source Charge		--	8.4	--	nC
Q_{gd}	Gate-Drain Charge		--	8.6	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DD}=-15V V_{GS}=-10V,R_G=2.5Ω ,I_D=-1A	--	8	--	ns
t_r	Turn-on Rise Time		--	19	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	75	--	ns
t_f	Turn-off Fall Time		--	46	--	ns
t_{rr}	Reverse recovery time	I_F=-12A, di/dt=100 A/uS	--	18	--	ns
Q_{rr}	Reverse recovery charge		--	7.8	--	nC

Note：

A. The data tested by surface mounted on a 1 inch^2 FR-4 board with 20Z copper.

B. The data tested by pulsed,Pulse Width≤300us,Duty cycle≤2%.

C. The E_{AS} data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.5mH,I_{AS}=17.8A.

D. The power dissipation is limited by 150℃ junction temperature.

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

Typical Characteristics

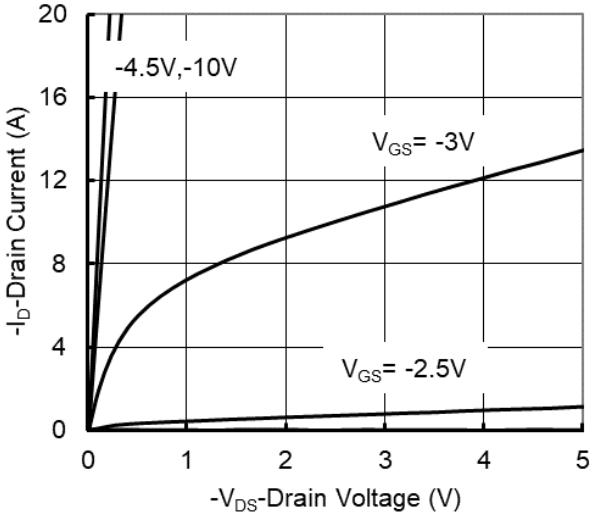


Figure 1. Output Characteristics

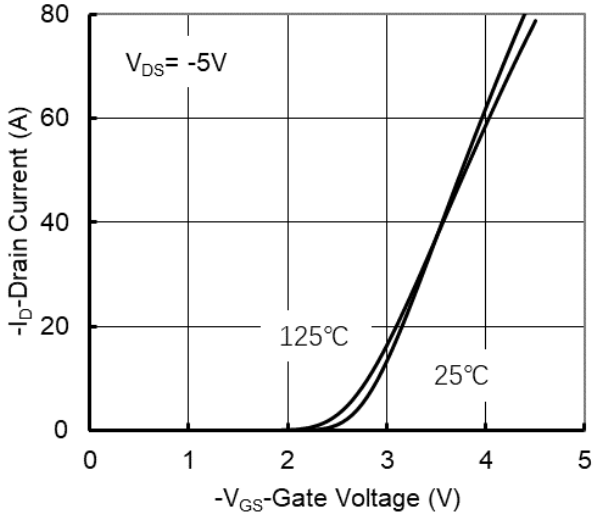


Figure 2. Transfer Characteristics

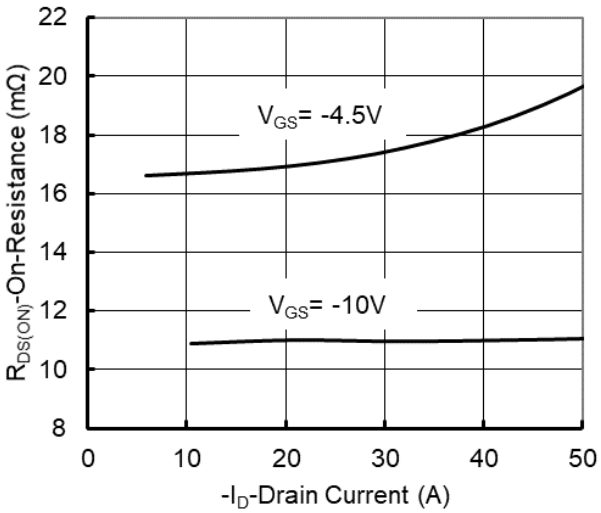


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

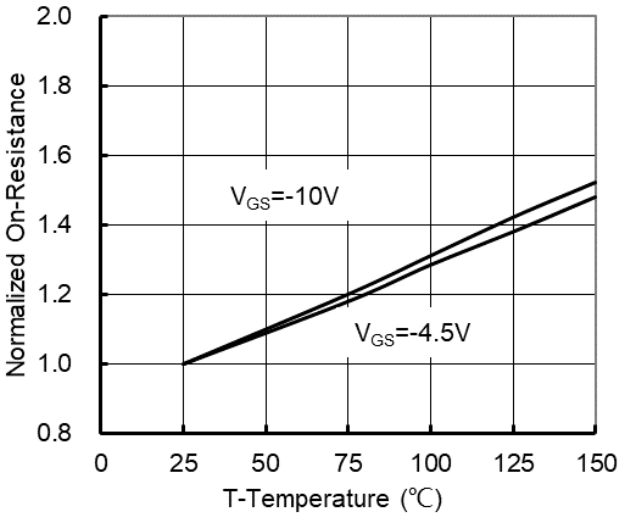


Figure 4. On-Resistance vs. Junction Temperature

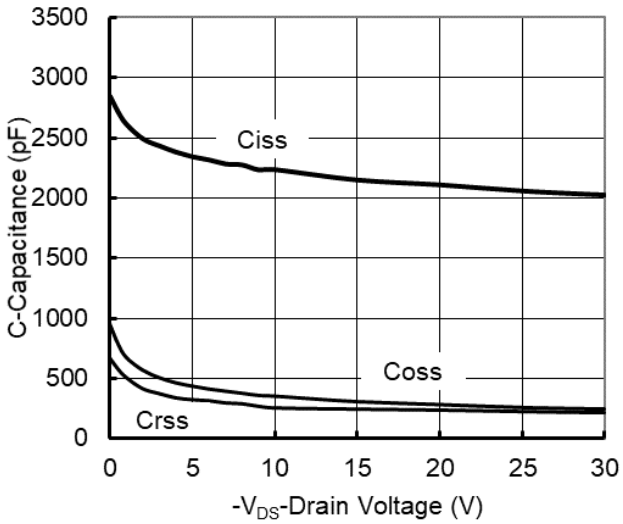


Figure 5. Capacitance Characteristics

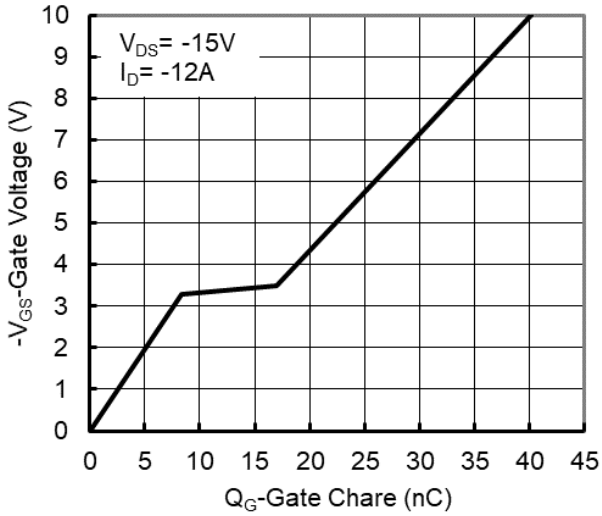


Figure 6. Gate Charge

Typical Characteristics

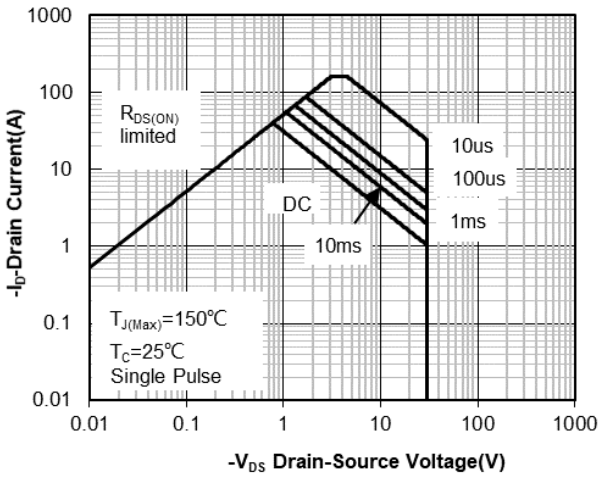


Figure 7. Safe Operation Area

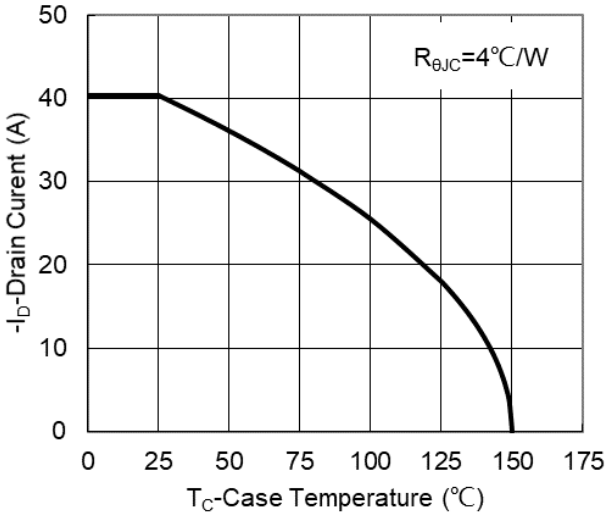


Figure 8. Maximum Continuous Drain Current vs Case Temperature

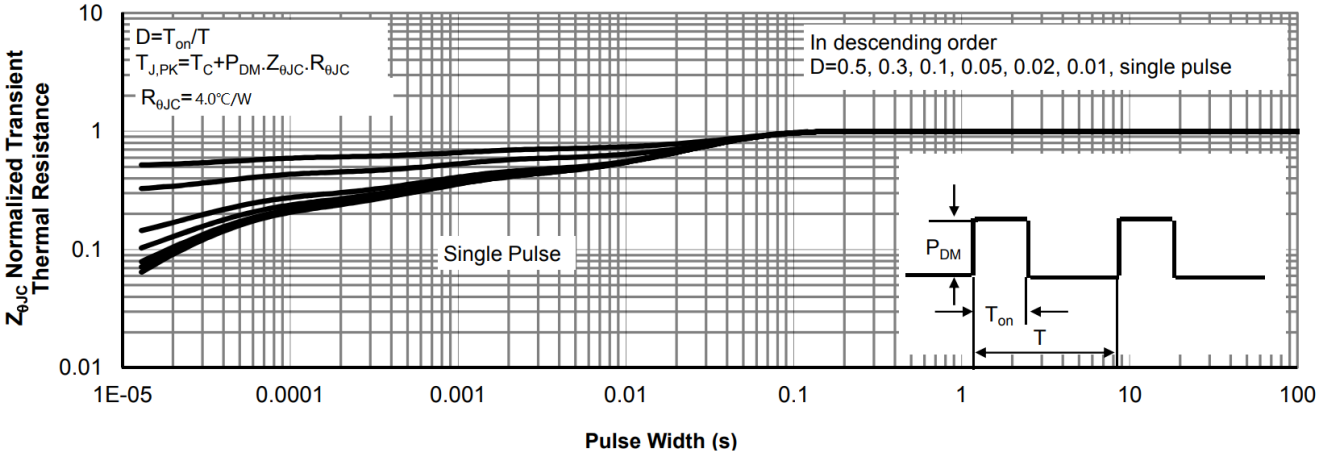
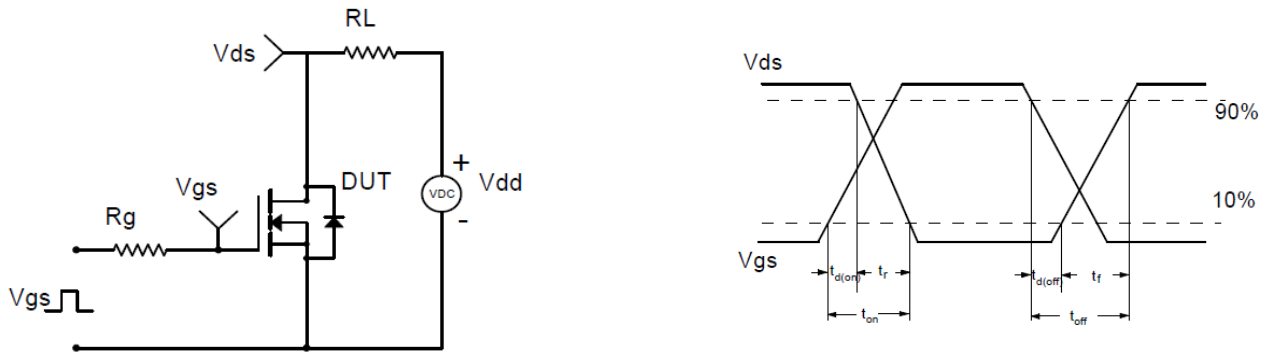
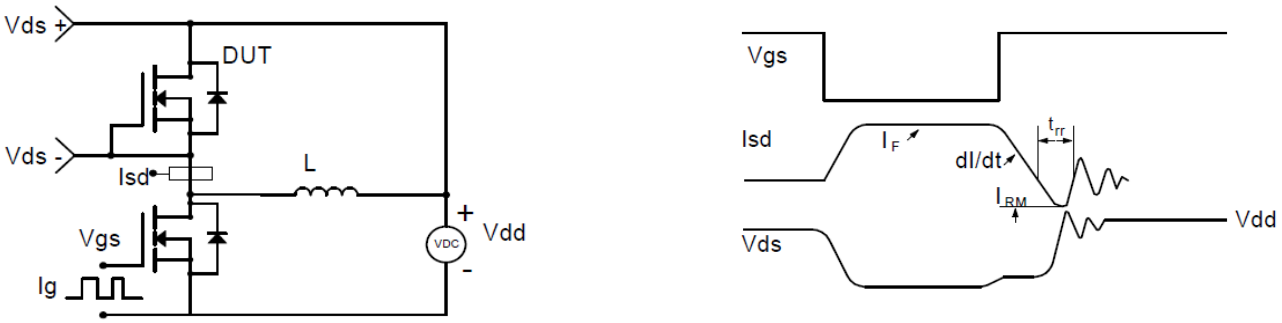


Figure 9. Normalized Maximum Transient Thermal Impedance

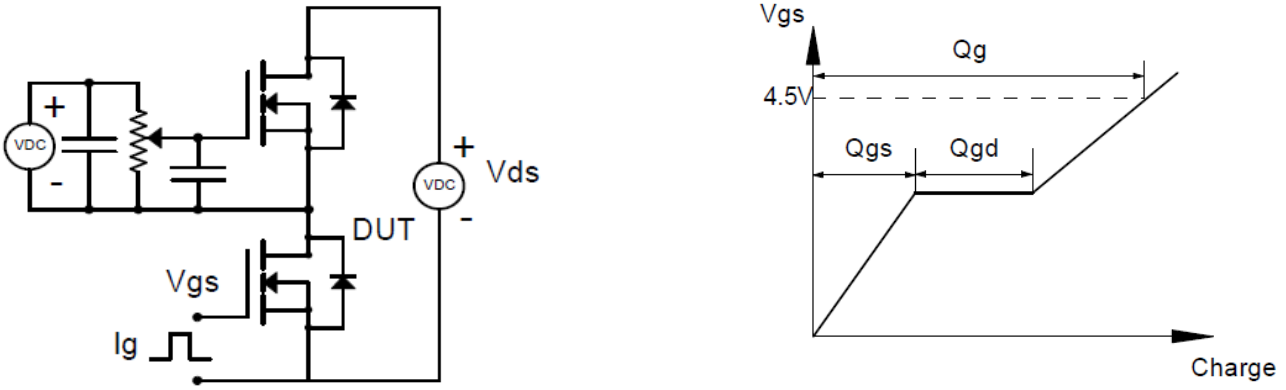
Typical Characteristics



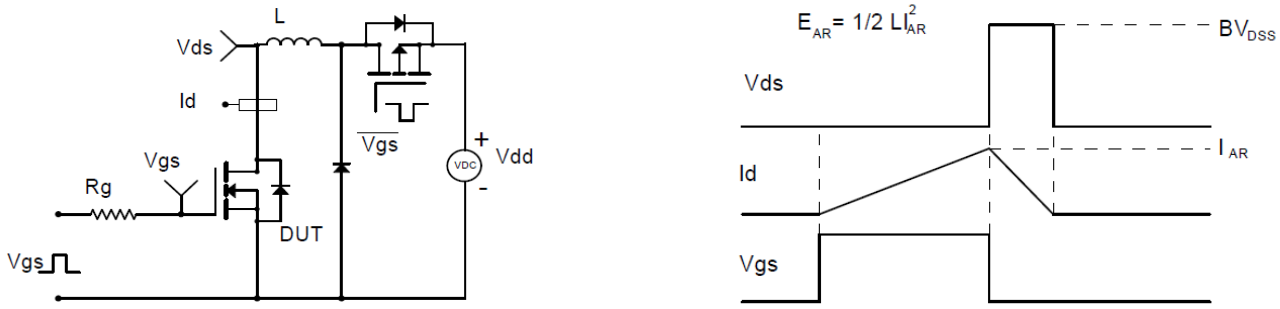
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

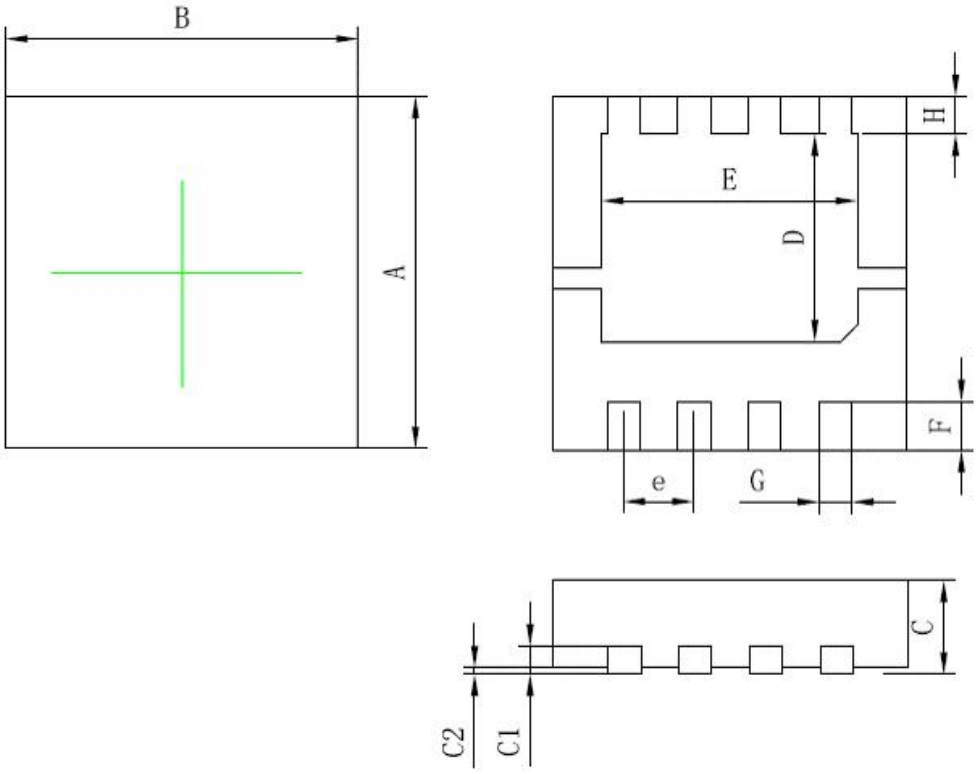


Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

DFN3.3X3.3-8L Package Information



A	B	C	C1
3.25±0.05	3.25±0.05	0.8±0.05	0.2±0.02
C2	D	E	F
0.05Max	1.9±0.1	2.35±0.15	0.45±0.05
G	H	e	
0.3±0.05	0.35±0.05	0.65±0.05	
unit: mm			