N-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	30	V
$R_{DS(ON)}$(at V_{GS}=10V) Typ.	4.9	mΩ
I_D(Tc=25℃)	50	A

Features

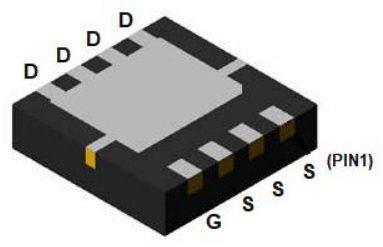
- High density cell design for low $R_{DS(ON)}$
- Trench Power LV MOSFET technology

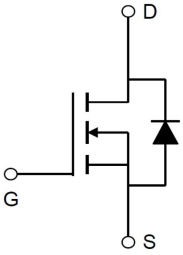
Applications

- Load switching
- Uninterruptible power supply

Pin Configuration

DFN3.3X3.3-8L





Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECAL50N03B	DFN3.3X3.3-8L	13″	3000pcs/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		±20	V
I_D	Continuous Drain Current [A]	T_C=25℃	50	A
		T_C=100℃	35	A
I_{DM}	Pulse Drain Current [B]		190	A
E_{AS}	Single Pulse Avalanche Energy [C]		225	mJ
P_D	Power Dissipation @T_C=25℃		30	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 [A]	4.2	℃/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}=24V,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 [B]	V_{GS}=10V,I_D=20A	--	4.9	6	mΩ
		V_{GS}=4.5V,I_D=15A	--	6.3	8	mΩ
V_{SD}	Diode Forward Voltage	I_S=1A,V_{GS}=0V	--	--	1	V
I_S	Continuous Diode Forward Current		--	--	50	A
Dynamic Parameters [D]						
C_{iss}	Input Capacitance	V_{GS}=0V,V_{DS}=15V f=1MHZ	--	2191	--	pF
C_{oss}	Output Capacitance		--	300	--	pF
C_{rss}	Reverse Transfer Capacitance		--	247	--	pF
Q_g	Total Gate Charge	V_{DS}=15V,I_D=20A V_{GS}=10V	--	46.3	--	nC
Q_{gs}	Gate-Source Charge		--	8.7	--	nC
Q_{gd}	Gate-Drain Charge		--	9.2	--	nC
$t_{D(on)}$	Turn-on Delay Time	V_{DS}=15V R_L=0.75Ω,R_G=3Ω, V_{GS}=10V	--	11.2	--	ns
t_r	Turn-on Rise Time		--	80.2	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	39	--	ns
t_f	Turn-off Fall Time		--	92.2	--	ns

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

B. The data tested by pulsed , pulse width≦300us , duty cycle≦2%.

C. The EAS data shows Max. rating . The test condition is V_{DS}=24V,V_{DD}=50V,V_{GS}=10V,L=0.1mH.

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

Typical Characteristics

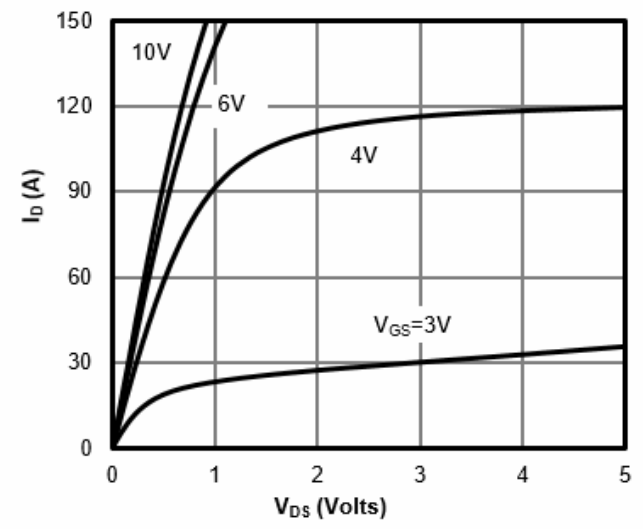


Figure1. Output Characteristics

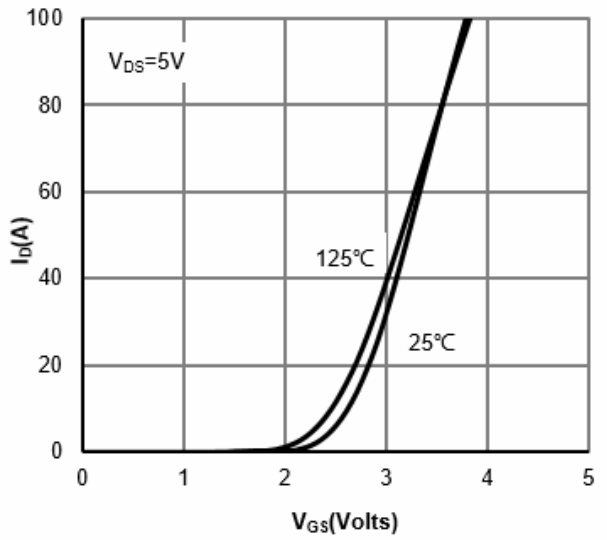


Figure2. Transfer Characteristics

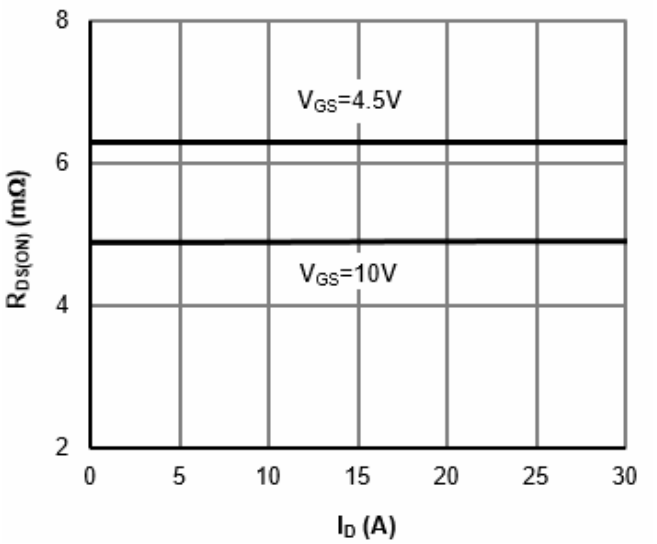


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

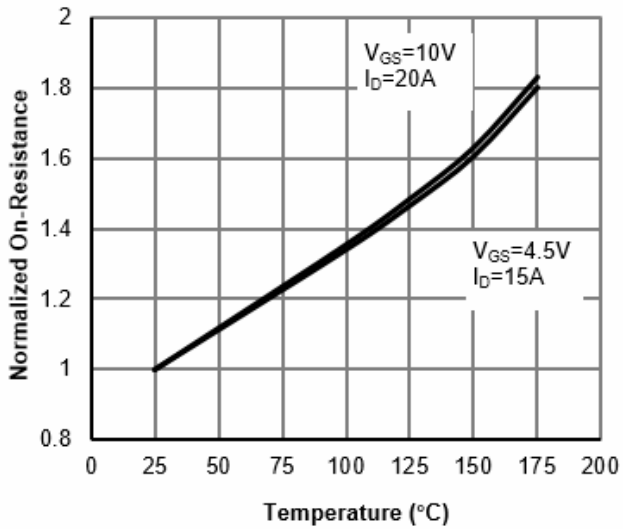


Figure 4: On-Resistance vs. Junction Temperature

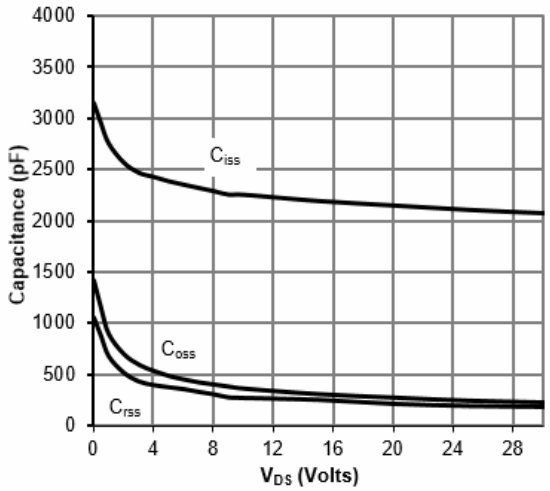


Figure5. Capacitance Characteristics

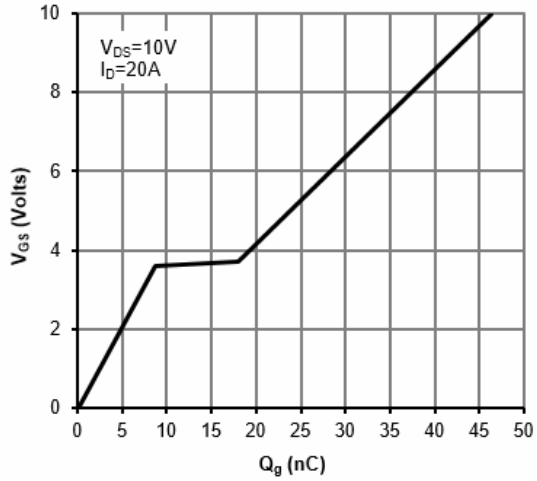


Figure6. Gate Charge

Typical Characteristics

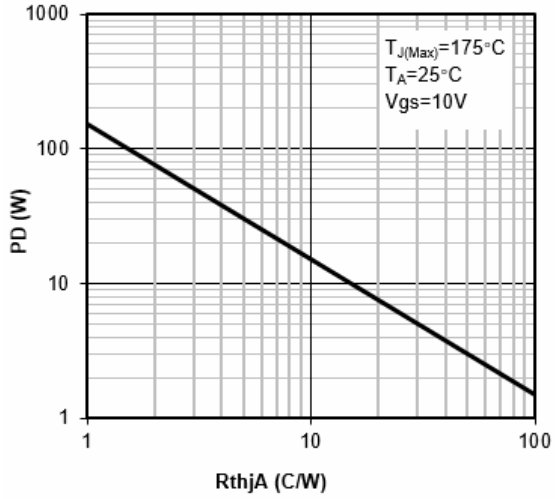


Figure7. PD vs RthjA

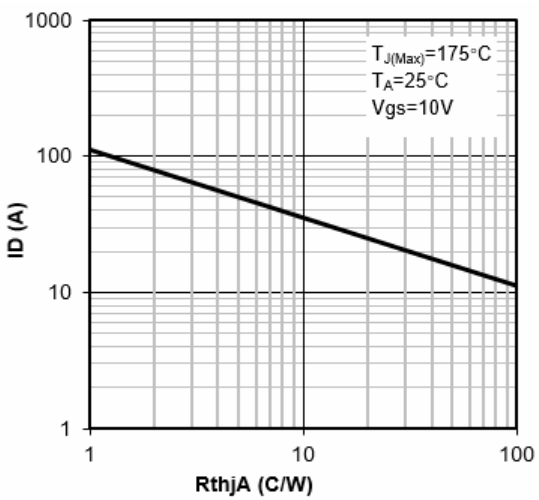


Figure8. ID vs RthjA

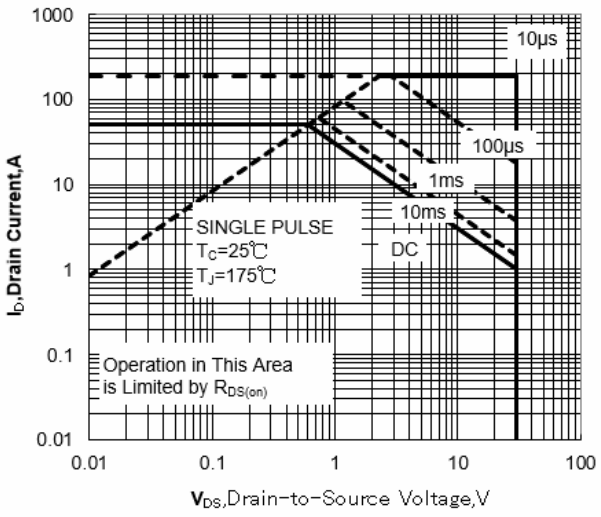


Figure9. Safe Operation Area

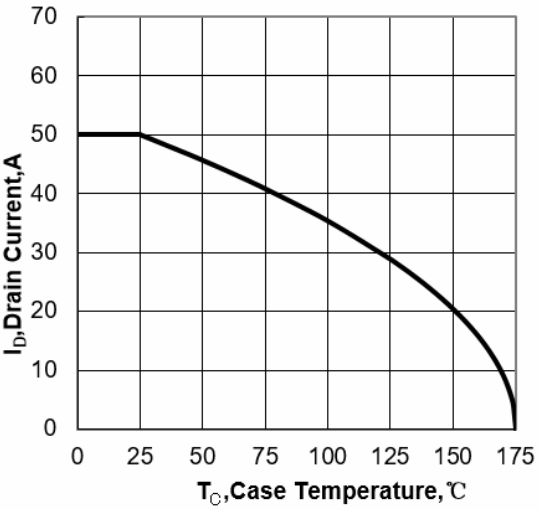


Figure10. Maximum Continuous Drain Current vs Case Temperature

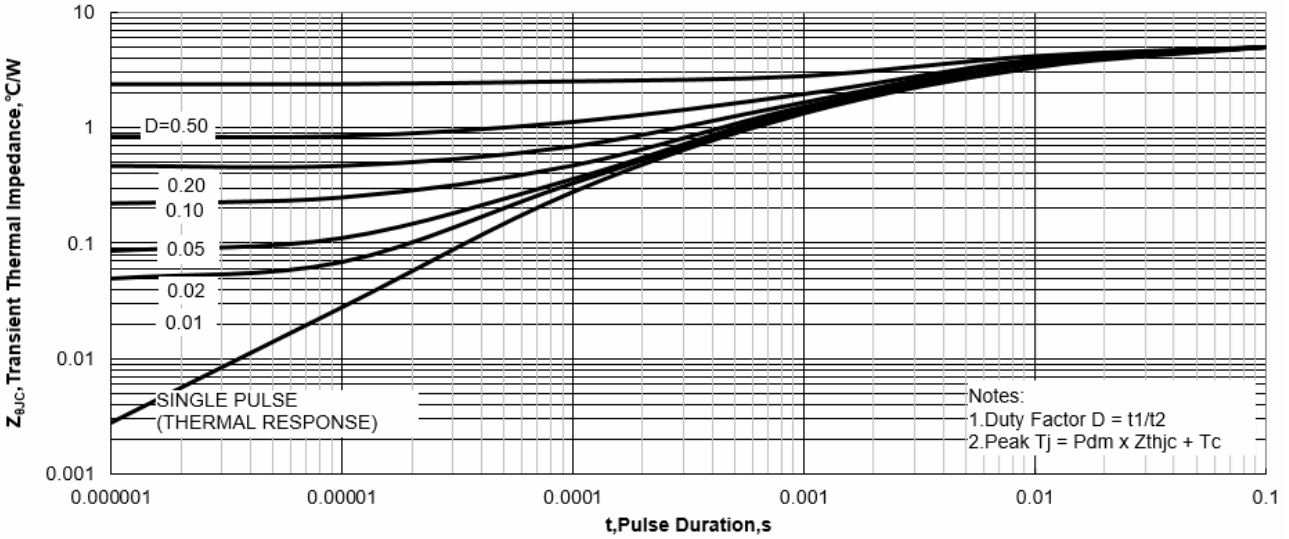
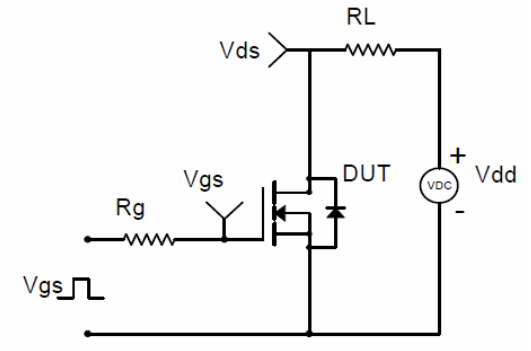
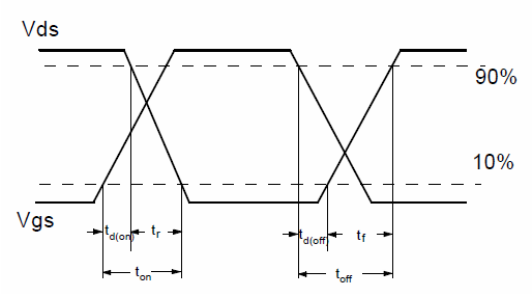


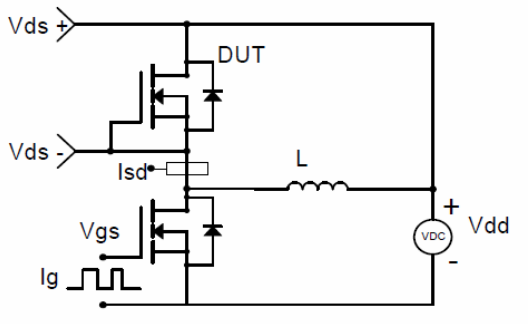
Figure11.Maximum Continuous Drain Current vs Case Temperature

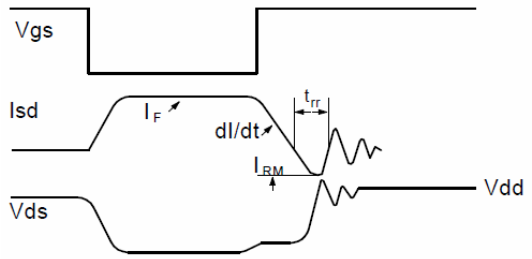
Typical Characteristics



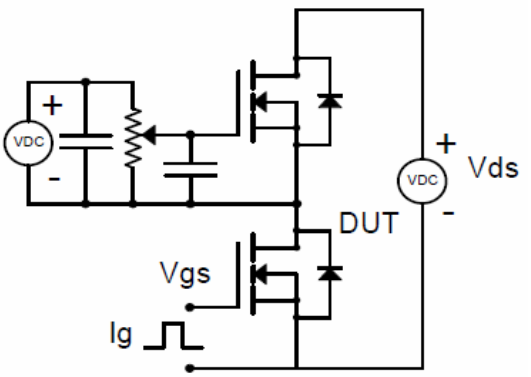


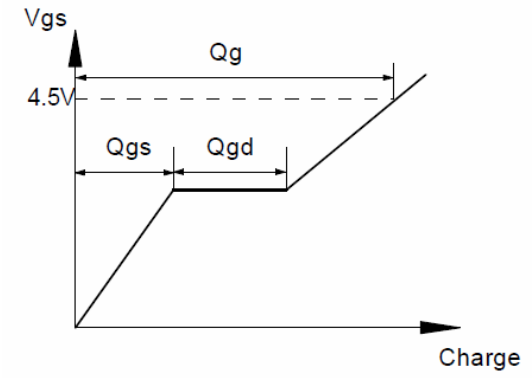
Resistive Switching Test Circuit & Waveforms



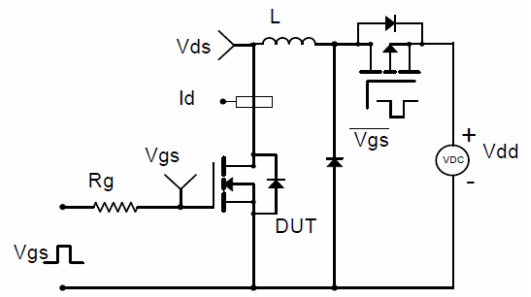


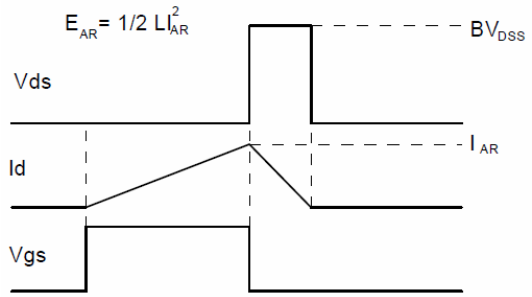
Diode Recovery Test Circuit & Waveforms





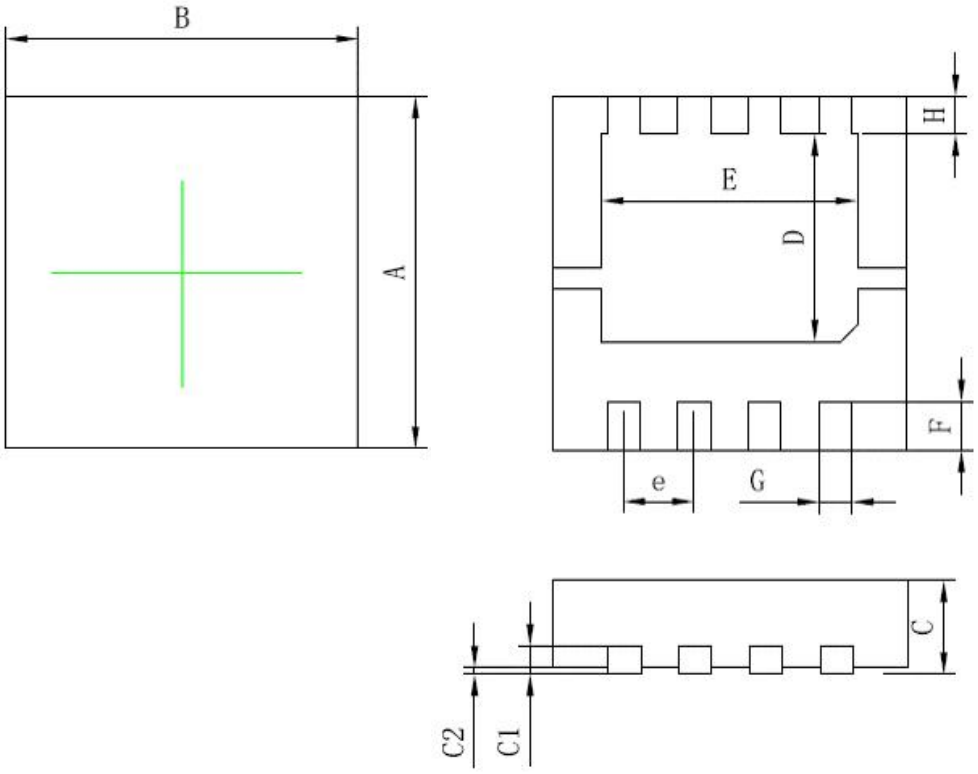
Gate Charge Test Circuit & Waveform





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			