

30V N-Channel MOSFET

General Description

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)

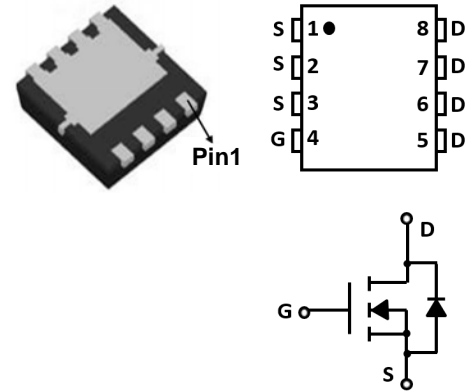
Applications

- High current load applications
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

Features

- V_{DS} 30V
- I_D 50A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) < 6.0 m Ω
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) < 8.0 m Ω
- ESD HBM 1000V \uparrow

DFN3.3x3.3 Pin Configuration



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	± 20	V
Drain Current	$T_C=25^\circ\text{C}$	I_D	50	A
	$T_C=100^\circ\text{C}$		35	
Pulsed Drain Current ^A		I_{DM}	190	A
Total Power Dissipation	$T_C=25^\circ\text{C}$	P_D	30	W
	$T_C=100^\circ\text{C}$		15	W
Single Pulse Avalanche Energy ^B		E_{AS}	225	mJ
Thermal Resistance Junction-to-Case ^C		$R_{\theta JC}$	5	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range		T_J, T_{STG}	-55 ~ +175	$^\circ\text{C}$

Ordering Information

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
FTK50N03BDFN33	F1	Q50N03B	5000	10000	100000	13" reel



FTK50N03BDFN33

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		4.9	6.0	m Ω
		$V_{GS}=4.5V, I_D=15A$		6.3	8.0	
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$			1.2	V
Maximum Body-Diode Continuous Current	I_S				50	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, f=1MHz$		2150		pF
Output Capacitance	C_{oss}			435		
Reverse Transfer Capacitance	C_{rss}			252		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=15V, I_D=20A$		52.8		nC
Gate-Source Charge	Q_{gs}			12.3		
Gate-Drain Charge	Q_{gd}			10.8		
Reverse Recovery Charge	Q_{rr}	$I_F=25A, di/dt=100A/us$		28		ns
Reverse Recovery Time	t_{rr}			27		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=20V, I_D=4A, R_L=1\Omega$ $R_{GEN}=3\Omega$		9		ns
Turn-on Rise Time	t_r			15.5		
Turn-off Delay Time	$t_{D(off)}$			29		
Turn-off fall Time	t_f			9		

A. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

B. $T_J=25^\circ\text{C}$, $V_{DS}=30V$, $V_{DD}=25V$, $V_{GS}=10V$, $L=1mH$.

C. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

Typical Performance Characteristics

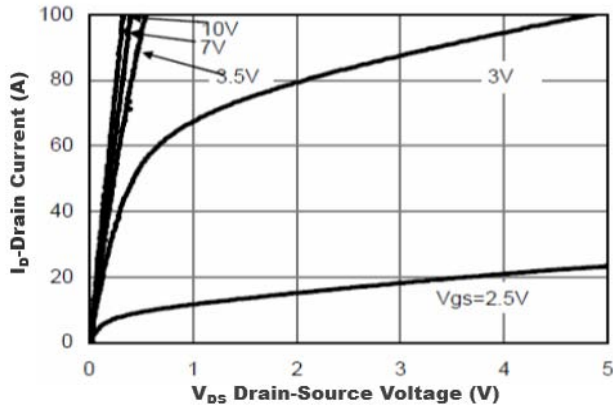


Figure1. Output Characteristics

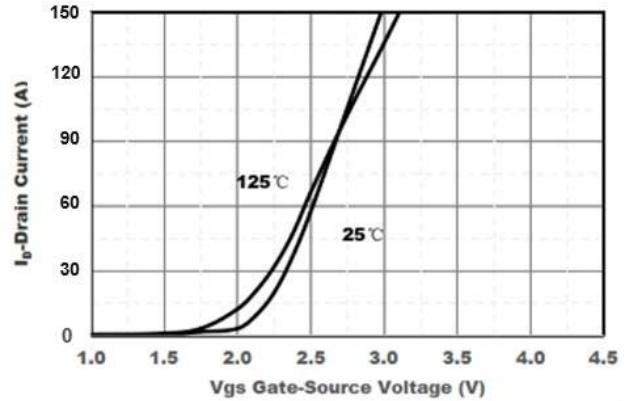


Figure2. Transfer Characteristics

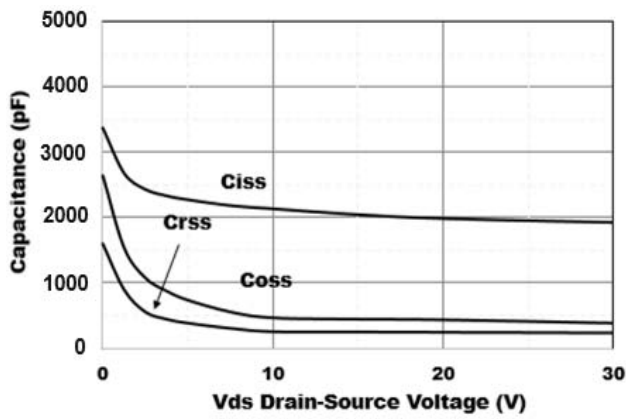


Figure3. Capacitance Characteristics

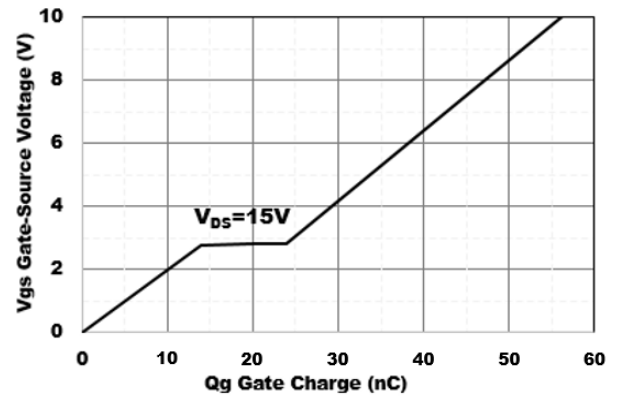


Figure4. Gate Charge

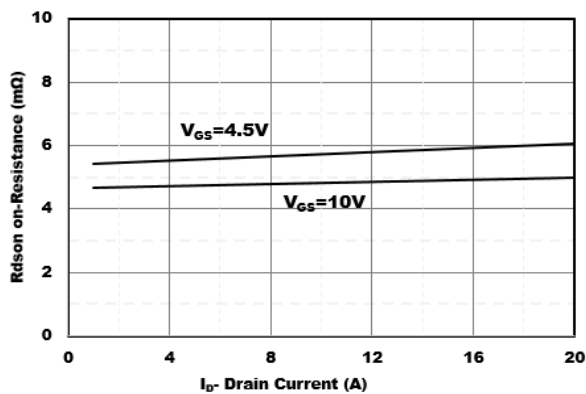


Figure5. Drain-Source on Resistance

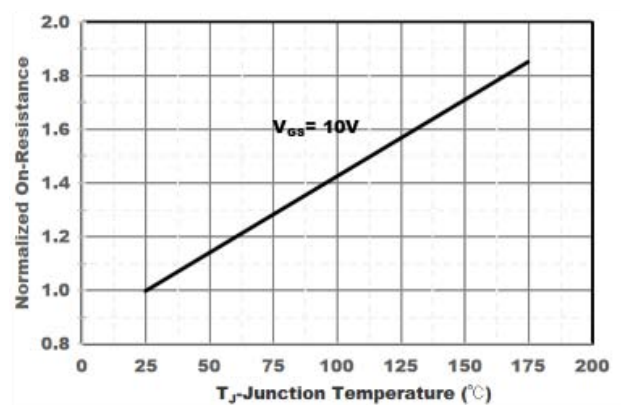


Figure6. Drain-Source on Resistance

Typical Performance Characteristics(Con.)

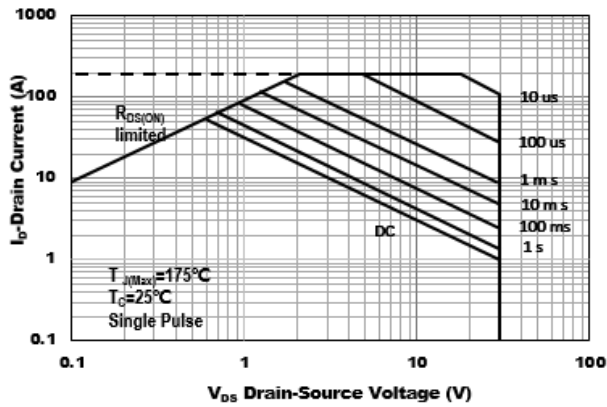


Figure7. Safe Operation Area

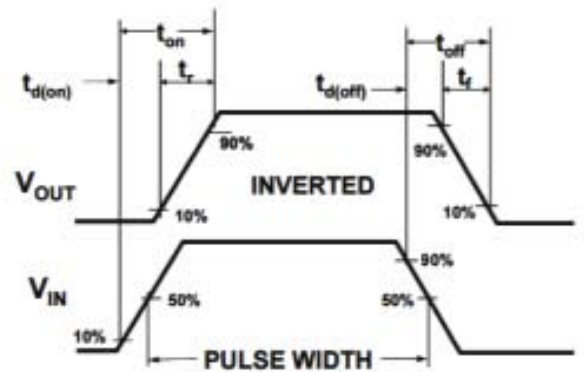
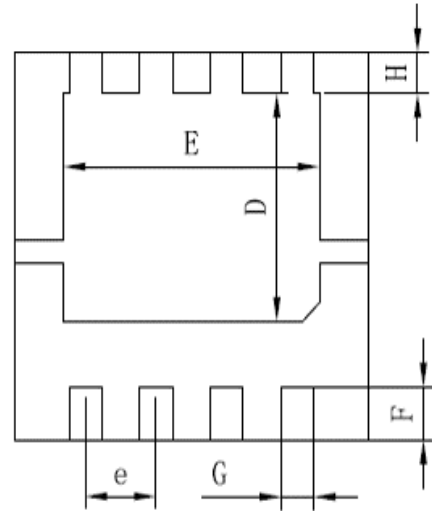
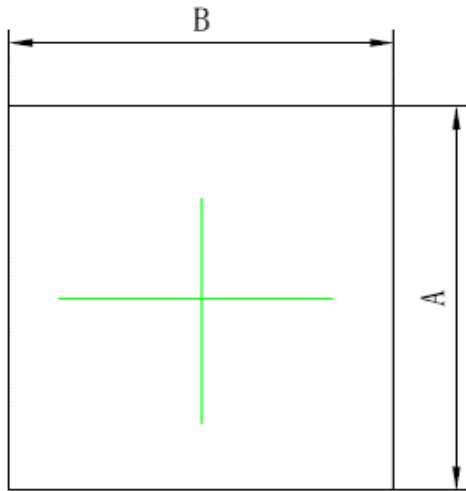


Figure8. Switching wave

DFN3.3X3.3 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			

