

30V N-Channel MOSFETs

General Description

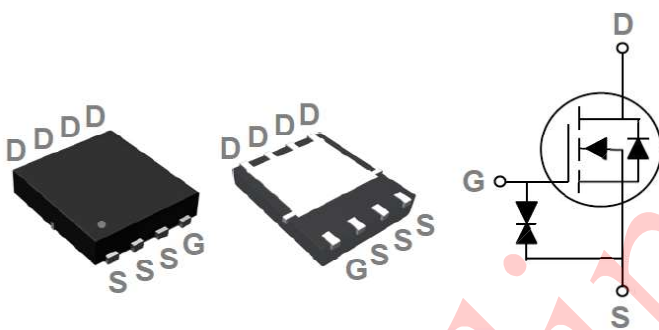
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology is designed to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche period. These devices are well suited for high efficiency fast switching applications.

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	6m Ω	50A

Features

- Fast switching
- Improved dv/dt capability
- Green Device Available

Power PAK 5060 Pin Configuration



Applications

- MB / VGA / Vcore
- POL Applications
- SMPS 2nd SR

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

Symbol	Parameter	Value	Unit	
V_{DS}	Drain-Source Voltage	30	V	
V_{GS}	Gate-Source Voltage	± 20		
I_D	Drain Current-Continuous ^A	$T_C = 25^\circ\text{C}$	50	A
		$T_C = 100^\circ\text{C}$	32	
I_{DM}	Drain Current-Pulsed ^{A, B}	$T_C = 25^\circ\text{C}$	200	
I_{AS}	Non-repetitive Avalanche Current ^E		30	
E_{AS}	Single Pulse Drain-to-Source Avalanche Energy ^E		45	mJ
P_D	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	27	W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Conditions	Value	Unit
$R_{\theta JA}$	Junction-to-Ambient ^C	Steady State	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Junction-to-Case	Steady State	4.58	$^\circ\text{C/W}$

Electrical Characteristics (T_J=25°C, unless otherwise noted)

Static State Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _{DS} = 250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 27V, V _{GS} = 0V	-	-	1	μA
		V _{DS} = 24V, V _{GS} = 0V, T _J = 85°C	-	-	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±20	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250μA	1.2	1.6	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} = 10V, I _{DS} = 20A	-	5	6	mΩ
		V _{GS} = 4.5V, I _{DS} = 15A	-	8	11	mΩ
g _{fs}	Forward Transconductance	V _{DS} = 10V, I _{DS} = 3A	-	6.6	-	S

Dynamic Characteristics Note D

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
C _{iss}	Input Capacitance	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz	-	680	-	pF
C _{oss}	Output Capacitance		-	507	-	pF
C _{rss}	Reverse Transfer Capacitance		-	27	-	pF
R _g	Gate Resistance	V _{DS} = 0V, f = 1MHz	-	1.5	-	Ω
Q _g	Total Gate charge	V _{GS} = 10V	-	13	-	nC
	Total Gate charge	V _{GS} = 4.5V	-	6.3	-	nC
Q _{gs}	Gate to Source Charge	V _{DD} = 15V, I _{DS} = 25A	-	1.1	-	nC
Q _{gd}	Gate to Drain Charge		-	2.2	-	nC
T _{d(on)}	Turn-On Delay Time		-	2.5	-	ns
t _r	Rise Time	V _{DD} = 15V, V _{GS} = 10V, I _{DS} = 25A, R _{G,ext} = 1Ω	-	3	-	ns
T _{d(off)}	Turn-Off Delay Time		-	5	-	ns
t _f	Fall Time		-	8	-	ns

Drain-Source Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Diode continuous forward current	-	-	-	50	A
I _{SM}	Diode pulse current	-	-	-	100	A
V _{SD}	Diode Forward Voltage ^B	V _{GS} = 0V, I _S = 1A	-	-	1	V

Note A, The maximum current rating is package limited.

Note B, The test condition is pulse width ≤ 300us, duty cycle ≤ 2%.

Note C, The R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. copper, determined by the PCB design, in a still air environment with T_A=25°C.

Note D, The switching characteristics are independent of operating junction temperatures. Not subject to product testing.

Note E, Maximum UIS current limited by test equipment. The test condition is L=0.1mH, Starting T_J=25°C.