

30V N-Channel MOSFETs

General Description

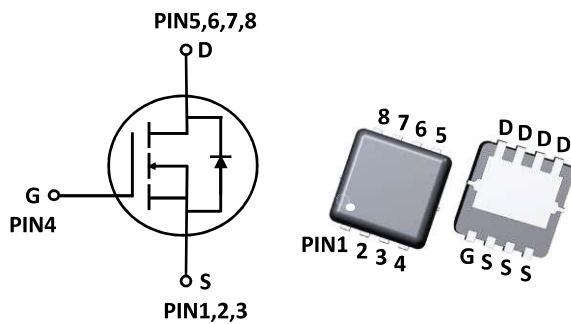
These N-Channel enhancement mode power field effect transistors are using trench - technology. This advanced technology is designed to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche period. These devices are well suited for high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

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	18m Ω	18A

Features

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

Power PAK 3333 Pin Configuration



Applications

- MB / VGA / Vcore
- Load Switch
- Hand-Held Instrument

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	$T_A = 25^\circ\text{C}$	8	A
		$T_A = 70^\circ\text{C}$	6	
		$T_C = 25^\circ\text{C}$	18	
		$T_C = 100^\circ\text{C}$	10	
I_{DM}	Drain Current-Pulsed ^{A, B}	$T_A = 25^\circ\text{C}$	50	
I_{AS}	Non-repetitive Avalanche Current ^E		15	
E_{AS}	Single Pulse Drain-to-Source Avalanche Energy ^E		11.25	mJ
P_D	Maximum Power Dissipation	$T_A = 25^\circ\text{C}$	3.1	W
		$T_C = 25^\circ\text{C}$	12.5	
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	40	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Junction-to-Case	Steady State	10	$^\circ\text{C}/\text{W}$

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} = 30V, V _{GS} = 0V	-	-	1	μA
		V _{DS} = 24V, V _{GS} = 0V, T _J = 125°C	-	-	10	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
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} = 12A	-	14	18	mΩ
		V _{GS} = 4.5V, I _{DS} = 8A	-	20	28	mΩ
g _{fs}	Forward Transconductance	V _{DS} = 10V, I _{DS} = 3A	-	5	-	S

Dynamic Characteristics Note D

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
C _{iss}	Input Capacitance	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz	-	480	-	pF
C _{oss}	Output Capacitance		-	75	-	pF
C _{rss}	Reverse Transfer Capacitance		-	65	-	pF
R _g	Gate Resistance	V _{DS} = 0V, f = 1MHz	-	2.5	-	Ω
Q _g	Total Gate charge	V _{GS} = 10V	-	11	-	nC
		V _{GS} = 4.5V	-	5.3	-	nC
Q _{gs}	Gate to Source Charge	V _{DD} = 15V, I _{DS} = 12A	-	2.1	-	nC
Q _{gd}	Gate to Drain Charge		-	2.4	-	nC
T _{d(on)}	Turn-On Delay Time		-	5.5	-	ns
t _r	Rise Time	V _{DD} = 15V, V _{GS} = 10V,	-	38	-	ns
T _{d(off)}	Turn-Off Delay Time	I _{DS} = 12A, R _{G,ext} = 3Ω	-	15	-	ns
t _f	Fall Time		-	2.8	-	ns

Drain-Source Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Diode continuous forward current		-	-	18	A
I _{SM}	Diode pulse current ^B		-	-	50	A
V _{SD}	Diode Forward Voltage ^B	V _{GS} = 0V, I _S = 1A	-	-	1	V
t _{rr}	Diode Reverse Recovery Time	I _S = 12A, di/dt = 100A/μs	-	5.2	-	ns
Q _{rr}	Diode Reverse Recovery Charge		-	0.9	-	nC

Note A, The maximum current rating is package limited.

Note B, The test condition is pulse width ≤ 300μs, 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.