

STP60NF06FP-VB Datasheet

N-Channel 60-V (D-S) MOSFET

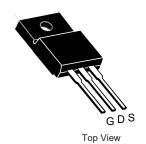
PRODUCT SUMMARY				
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^a		
60	0.010 at V _{GS} = 10 V	70		
00	0.012 at V _{GS} = 4.5 V	55		

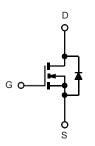
FEATURES

- 175 °C Junction Temperature
- Trench Power MOSFET
- Material categorization:









N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 25	°C, unless otherv	vise noted)		
Parameter		Symbol	Limit	Unit
Gate-Source Voltage		V _{GS}	± 20	V
Continuous Drain Current (T _J = 175 °C) ^b	T _C = 25 °C	- I _D	70	
	T _C = 100 °C		50ª	
Pulsed Drain Current		I _{DM}	200	A
Continuous Source Current (Diode Conduction)		I _S	50ª	
Avalanche Current		I _{AS}	50	
Single Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E _{AS}	125	mJ
Maximum Power Dissipation	T _C = 25 °C	P _D	136	W
Maximum Fower Dissipation	T _A = 25 °C		3 ^b , 8.3 ^{b, c}	
Operating Junction and Storage Temperature Range		T _J , T _{stq}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS							
Parameter		Symbol	Typical	Maximum	Unit		
Marinerum Irumation to Amelionta	t ≤ 10 sec	R _{thJA}	15	18	°C/W		
Maximum Junction-to-Ambient ^a	Steady State		40	50			
Maximum Junction-to-Case		R _{thJC}	0.85	1.1			

Notes:

- a. Package limited.
- b. Surface mounted on 1" x 1" FR4 board.
- c. $t \le 10 \text{ s}$.



Parameter	Symbol	Test Conditions	Min.	Typ.a	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	60			\/	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1	2	3	V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
		V _{DS} = 60 V, V _{GS} = 0 V			1		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V, T _J = 125 °C			50		
		V _{DS} = 60 V, V _{GS} = 0 V, T _J = 175 °C			250		
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	60			Α	
		V _{GS} = 10 V, I _D = 20 A		0.010			
		V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C		0.016		0	
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C		0.020		V nA μA	
		$V_{GS} = 4.5 \text{ V}, I_D = 15 \text{ A}$		0.012			
Forward Transconductance ^b	9 _{fs}	$V_{DS} = 15 \text{ V}, I_{D} = 20 \text{ A}$		60		S	
Dynamic			<u>'</u>	•			
Input Capacitance	C _{iss}			2650			
Output Capacitance	C _{oss}	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		470		pF	
Reverse Transfer Capacitance	C _{rss}			225			
Total Gate Charge ^c	Qg			47	70		
Gate-Source Charge ^c	Q _{gs}	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 50 A		10		nC	
Gate-Drain Charge ^c	Q_{gd}			12		1	
Turn-On Delay Time ^c	t _{d(on)}			10	20		
Rise Time ^c	t _r	V_{DD} = 30 V, R_{L} = 0.6 Ω $I_{D} \cong$ 50 A, V_{GEN} = 10 V, R_{g} = 2.5 Ω		15	25		
Turn-Off Delay Time ^c	t _{d(off)}			35	50	1115	
Fall Time ^c	t _f			20	30		
Source-Drain Diode Ratings and Cha	aracteristics (T _C = 25 °C)			· '		
Pulsed Current	I _{SM}				70	Α	
Diode Forward Voltage	V _{SD}	I _F = 20 A, V _{GS} = 0 V		1	1.5	V	
Reverse Recovery Time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		45	100	ns	

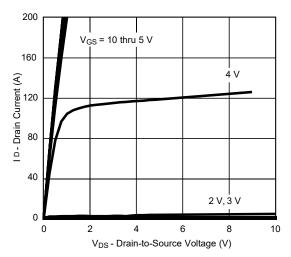
Notes:

- a. For design aid only; not subject to production testing.
- b. Pulse test; pulse width $\leq 300~\mu s$, duty cycle $\leq 2~\%$.
- c. Independent of operating temperature.

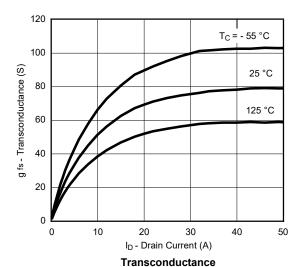
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



TYPICAL CHARACTERISTICS (25 °C unless noted)



Output Characteristics



C - Capacitance (pF) 2500 2000 1500 1000 $\mathsf{C}_{\mathsf{oss}}$ 500 $C_{\rm rss}$

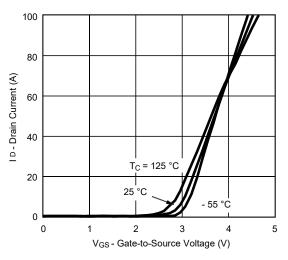
20

 $\overline{C_{iss}}$

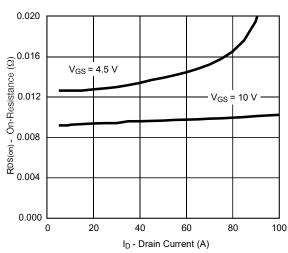
V_{DS} - Drain-to-Source Voltage (V) Capacitance

30

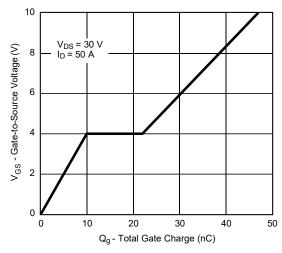
60



Transfer Characteristics



On-Resistance vs. Drain Current



Gate Charge

10

4000 3500

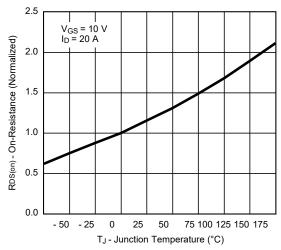
3000

0

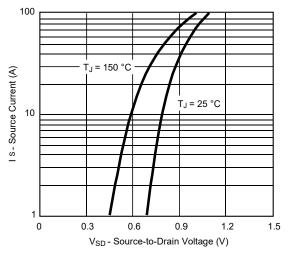
0



TYPICAL CHARACTERISTICS (25 °C unless noted)



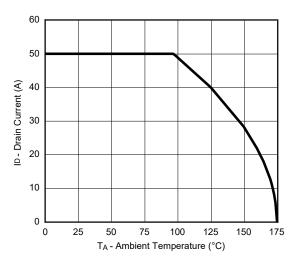
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

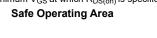


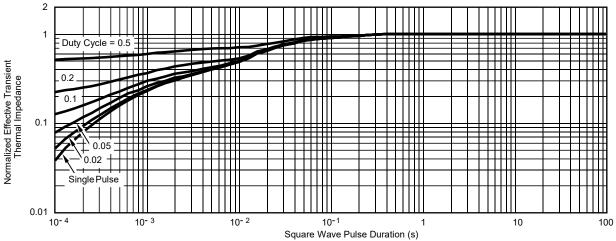
THERMAL RATINGS



1000 Limited by R_{DS(on)*} 100 100 µs ID - Drain Current (A) 10 1 ms 10 ms 100 ms DC T_C = 25 °C Single Pulse 0.1 0.01 0.1 100 V_{DS} - Drain-to-Source Voltage (V) * V_{GS} > minimum V_{GS} at which R_{DS(on)} is specified

Maximum Drain Current vs. Ambient Temperature





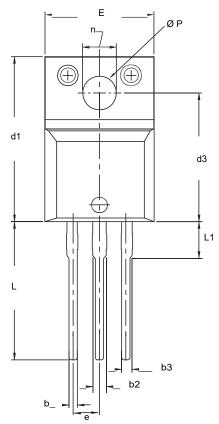
Normalized Thermal Transient Impedance, Junction-to-Case

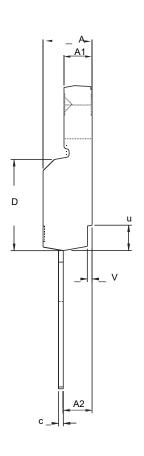
服务热线:400-655-8788

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TO-220 FULLPAK (HIGH VOLTAGE)





DIM.	MILLIN	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.	
Α	4.570	4.830	0.180	0.190	
A1	2.570	2.830	0.101	0.111	
A2	2.510	2.850	0.099	0.112	
b	0.622	0.890	0.024	0.035	
b2	1.229	1.400	0.048	0.055	
b3	1.229	1.400	0.048	0.055	
С	0.440	0.629	0.017	0.025	
D	8.650	9.800	0.341	0.386	
d1	15.88	16.120	0.622	0.635	
d3	12.300	12.920	0.484	0.509	
E	10.360	10.630	0.408	0.419	
е	2.54	BSC	0.100	BSC	
L	13.200	13.730	0.520	0.541	
L1	3.100	3.500	0.122	0.138	
n	6.050	6.150	0.238	0.242	
ØΡ	3.050	3.450	0.120	0.136	
u	2.400	2.500	0.094	0.098	
V	0.400	0.500	0.016	0.020	

DWG: 5972

Notes

- To be used only for process drawing.
 These dimensions apply to all TO-220, FULLPAK leadframe versions 3 leads.
 All critical dimensions should C meet C_{pk} > 1.33.
 All dimensions include burrs and plating thickness.

- 5. No chipping or package damage.



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