VFTA020R280NA

Datasheet

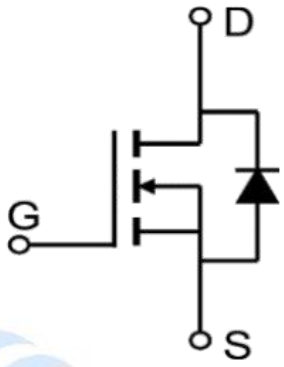
28mΩ, 200V, N-Channel MOSFET VFTA020R280NA

Description

- 200V N-channel SGT MOSFET
- It has been designed to very low on-state resistance (R_{DSON}) and yet maintain superior switching performance

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
200V	28mΩ@10V	60A

Symbol

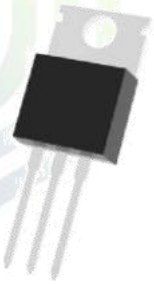


Symbol of VFTA020R280NA

Features

- N-channel, optimized for high-speed smooth switching
- Excellent gate charge ×R_{DSON} (FOM)
- Very low on-resistance
- RoHS compliant [Note 1]
- Halogen-free [Note 1]

Package Type



Package Type of VFTA020R280NA

Application

- SMPS
- Motor drivers
- BMS
- Solor MPPT

Ordering Information

Product Name	Package
VFTA020R280NA	TO220

Absolute Maximum Ratings (T_j= 25 ºC, unless otherwise specified)

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	200	V
Drain Current - Continuous (T_C= 25°C) Note1	I_D	60	A
Drain Current - Continuous (T_C= 100°C)		36	A
Drain Current - Pulsed Note 2	I_{DM}	240	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulsed Avalanche Energy Note 3	E_{AS}	600	mJ
Power Dissipation (T_C = 25°C)	P_D	176	W
Continuous diode forward current (T_C = 25°C)	I_S	240	A
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to +150	°C

Thermal Resistance

Parameter	Symbol	Value	Units
Thermal Resistance, Junction-to-Case, Steady-State	$R_{\theta JC}$	0.7	°C/W
Thermal Resistance, Junction-to-Ambient, Steady State Note 4	$R_{\theta JA}$	42	°C/W

Notes:

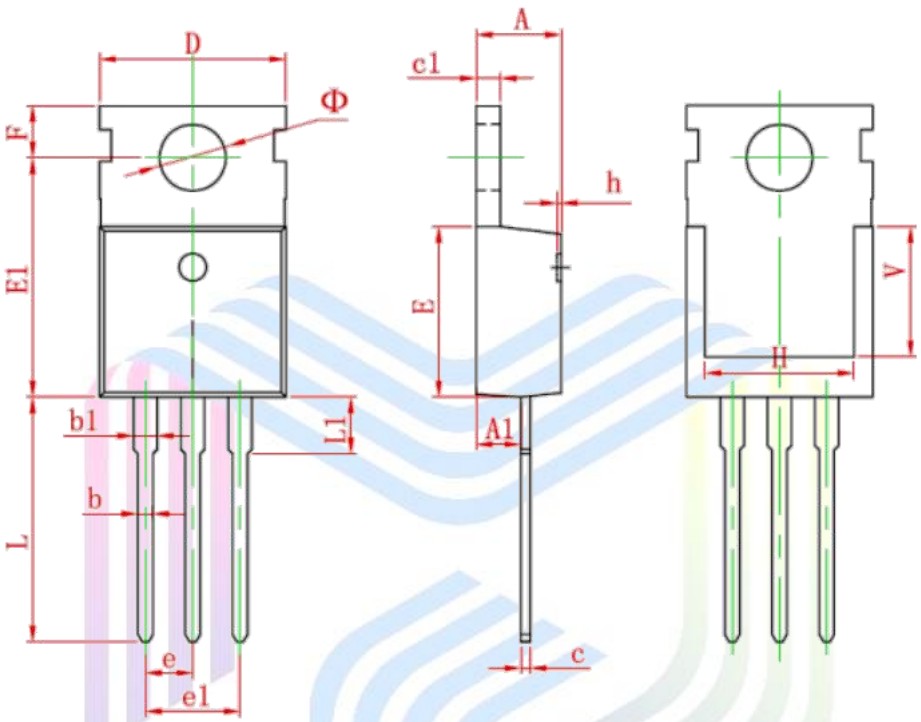
1. The max Drain current rating is package limited
2. Pulse width limited by maximum junction temperature
3. L = 10mH, V_{DD} = 30 V, I_{AS} = 11 A, Starting T_j= 25 °C
4. Mount on minimum PCB layout

Electrical Characteristics(T_j= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
StaticCharacteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 1 mA	200	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 200 V, V_{GS}=0 V	-	-	1	uA
Gate Leakage Current	I_{GSS}	V_{GS} = ± 30 V, V_{DS} = 0 V	-	-	±100	nA
Gate Threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 uA	2.5	3	3.5	V
Drain-Source on-state resistance	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 30 A	-	22	28	mΩ
		V_{GS} = 10 V, I_D = 30 A T_j=150 °C	-	45	-	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V f = 1 MHz	-	1293	-	pF
Output Capacitance	C_{oss}		-	1890	-	pF
Reverse Transfer Capacitance	C_{rss}		-	50	-	pF
Switching Characteristics						
Turn On Delay Time	$T_{D(on)}$	V_{DS}= 100 V , I_D=30 A V_{GS} = 0-10 V	-	28	-	ns
Rise Time	Tr		-	23	-	ns
Turn Off Delay Time	$T_{D(off)}$		-	35	-	ns
Fall Time	T_f		-	24	-	ns
Total Gate Charge	Q_g	V_{DD} = 100 V , I_D = 30 A V_{GS} = 0 to10 V	-	45	-	nC
Gate-Source Charge	Q_{gs}		-	15	-	nC
Gate-Drain Charge	Q_{gd}		-	13	-	nC
Gate plateau voltage	Vplateau		-	5	-	V
Drain-Source Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V_{SD}	I_F=30 A , di_F/dt=100A/us	-	-	1.2	V
Reverse recovery time	T_{rr}		-	120	-	ns
Reverse recovery charge	Q_{rr}		-	0.4	-	nC

Mechanical Dimensions

TO220 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150

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