

N Channel Super Trench Power MOSFET

GENERAL DESCRIPTION

The product utilizes the latest super trench processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

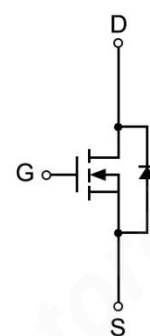
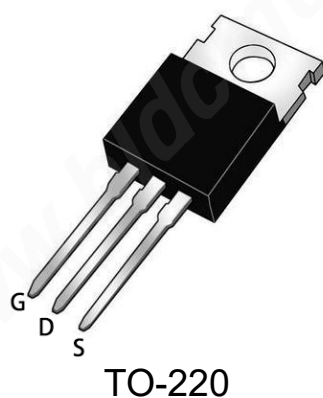
FEATURES

- 100V/155A, $R_{DS(ON)} = 3.5m\Omega @ V_{GS} = 10V$ (Typical)
- Fast switching and reverse body recovery
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

APPLICATIONS

- DC/DC converters
- Hard switched and high frequency circuits
- Synchronous rectification

PIN DESCRIPTION



N-Channel MOSFET

N Channel Enhancement Mode Power MOSFET

Absolute Maximum Ratings($T_c=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	$T_c=25^{\circ}\text{C}$	A
		$T_c=100^{\circ}\text{C}$	
I_{DM}	Pulsed Drain Current	650	A
P_D	Maximum Power Dissipation	250	W
EAS(Note)	Single Pulse Avalanche Energy	1500	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to $+150$	$^{\circ}\text{C}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.6	$^{\circ}\text{C/W}$

Electrical Characteristics($T_a=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=70V, V_{GS}=0V$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	2		4	V
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=30A$		3.5	4.2	$m\Omega$

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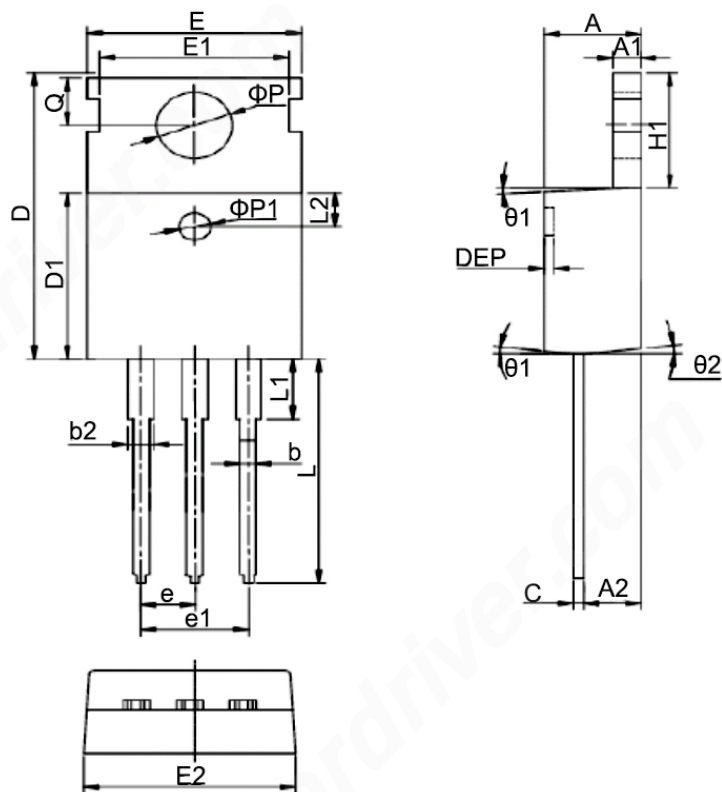
Electrical Characteristics(Ta=25°C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =30A			1.3	V
T _{rr}	Reverse Recovery Time	I _{SD} =40A		65		ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us		140		nC
Dynamic Characteristics						
T _{d(on)}	Turn-on Delay Time	V _{DS} =50V, R _G =3Ω, I _{DS} =40A, V _{GS} =10V		30		ns
T _r	Turn-on Rise Time			78		
T _{d(off)}	Turn-off Delay Time			55		
T _f	Turn-off Fall Time			19		
C _{ISS}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, f=1.0MHz		7500		pF
C _{OSS}	Output Capacitance			810		
C _{RSS}	Reverse Transfer Capacitance			50		
Q _g	Total Gate Charge	V _{DS} =50V, I _D =40A, V _{GS} =10V		115		nC
Q _{gs}	Gate-Source Charge			40		
Q _{gd}	Gate-Drain Charge			25		

Note:

1.E_{AS} condition: T_J=25°C, V_{DD}=50V, V_G=10V, L=0.5mH, R_G=25Ω

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SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185	Φp1	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.27	1.30	1.33	0.050	0.051	0.052	e	2.54BSC			0.1BSC		
A2	2.35	2.40	2.50	0.093	0.094	0.098	e1	5.08BSC			0.2BSC		
b	0.77	-	0.90	0.030	-	0.035	H1	6.40	6.50	6.60	0.252	0.256	0.260
b2	1.23	-	1.36	0.048	-	0.054	L	12.75	-	13.17	0.502	-	0.519
C	0.48	0.50	0.52	0.019	0.020	0.021	L1	-	-	3.95	-	-	0.156
D	15.40	15.60	15.80	0.606	0.614	0.622	L2	2.50REF			0.098REF		
D1	9.00	9.10	9.20	0.354	0.358	0.362	Φp	3.57	3.6	3.63	0.141	0.142	0.143
DEP	0.05	0.10	0.20	0.002	0.004	0.008	Q	2.73	2.80	2.87	0.107	0.110	0.113
E	9.70	9.90	10.10	0.382	0.389	0.398	Θ1	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	Θ2	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							