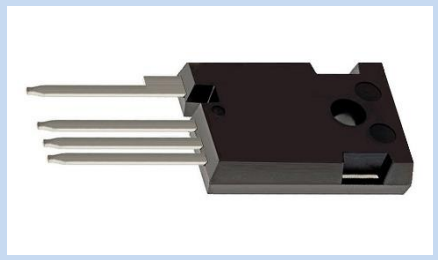
Silicon Carbide MOSFET
N-Channel 900V 46A TO-247-4

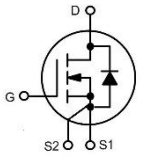
MFTC90N46T2474

MERITEK

FEATURE



- $R_{DS(ON)}$<84mΩ at V_{GS}=18V, I_D=20A
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery Charge
- Applications: DC-DC Converter, Server Power Supplier, EV Charging, Solar PV Inverters, UPS



RoHS

MECHANICAL DATA

- Case: TO-247-4 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

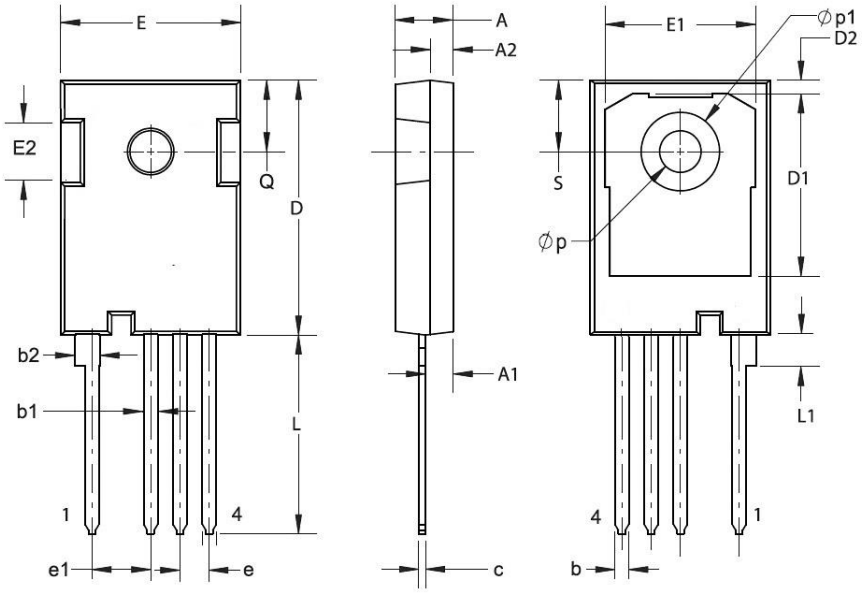
MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage	V_{GS}=0V, I_D=100μA	V_{DS}	900	V
Gate-Source Voltage	Absolute Maximum Value	V_{GS}	-8/+22	V
	Recommended operational values		-4/+18	
Drain Current – Continuous	V_{GS} =18V, T_C=25°C	I_D	46	A
	V_{GS} =18V, T_C=100°C		32	A
Power Dissipation		P_D	221	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	0.68	°C / W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 175	°C

DIMENSIONS

TO-247-4	Min (mm)	Max (mm)
A	4.80	5.20
A1	2.25	2.45
A2	1.85	2.15
b	1.05	1.35
b1	1.00	1.60
b2	2.35	2.95
c	0.50	0.70
D	22.34	22.74
D1	16.0	17.0
D2	0.97	1.37
e	2.34	2.74
e1	4.88	5.28
E	15.60	16.00
E1	13.50	14.50
E2	4.80	5.20
L	18.08	18.68
L1	2.38	2.78
p	3.50	3.70
p1	6.60	7.00
Q	6.00	6.30
S	6.00	6.30

Note: 1:Drain(D), 2:Source(S2), 3:Source(S1), 4:Gate(G)



ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=100μA	BV_{DSS}	900	--	--	V
Zero Gate Voltage Drain Current	V_{DS}=900V, V_{GS}=0V	I_{DSS}	--	--	50	μA
Gate-Source Leakage Current	V_{GS}=-8/+22V, V_{DS}=0V	I_{GSS}	--	--	250	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=18V, I_D=20A	$R_{DS(ON)}$	--	60	84	mΩ
	V_{GS}=18V, I_D=20A, T_J=175°C		--	76	--	
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=5mA	$V_{GS(th)}$	1.8	2.6	4.0	V
	V_{GS}=V_{DS}, I_D=5mA, T_J=175°C		--	1.8	--	
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=720V, I_D=20A, V_{GS}= -4/+18V	Q_g	--	90	--	nC
Gate-Source Charge		Q_{gs}	--	30	--	
Gate-Drain Charge		Q_{gd}	--	28	--	
Turn-On Delay Time	V_{DS}=720V, I_D=20A, V_{GS}= -4/+18V, R_{GEN}=2.5Ω, R_L=36Ω	$T_{d(on)}$	--	18	--	nS
Rise Time		T_r	--	15	--	
Turn-Off Delay Time		$T_{d(off)}$	--	30	--	
Fall Time		T_f	--	15	--	
Input Capacitance	V_{DS}=450V, V_{GS}=0V, V_{AC}=25mV f=1MHz	C_{iss}	--	1800	--	pF
Output Capacitance		C_{oss}	--	115	--	
Reverse Transfer Capacitance		C_{rss}	--	15	--	
Turn-On Energy	V_{DS}=720V, I_D=20A, V_{GS}= -4/+18V, R_{GEN}=2.5Ω, L=200μH	E_{on}	--	190	--	μJ
Turn-Off Energy		E_{off}	--	70	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	V_{GS}= -4V, I_{SD}=10A	V_{SD}	--	4.5	--	V
	V_{GS}= -4V, I_{SD}=10A, T_J=175°C		--	4.0	--	
Diode Forward Current - Continuous	V_{GS}= -4V	I_S	--	--	46	A
Peak Reverse Recovery Current	V_R=720V, I_{SD}=20A	I_{rm}	--	9	--	A
Reverse Recovery Time		T_{rr}	--	20	--	nS
Reverse Recovery Charge		Q_{rr}	--	90	--	nC