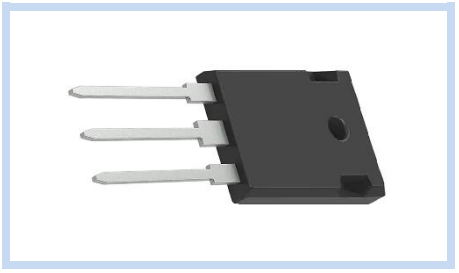
N-Channel MOSFET
650V 70A 488W TO-247

MFT65N70T247

MERITEK

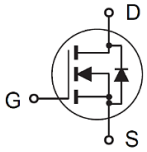
FEATURE

- $R_{DS(ON)}$≤36mΩ at V_{GS}=10V
- Low On-Resistance and Low Conduction Losses
- Ultra-Low Gate Charge for Lower Driving Requirements
- Applications: Server Power Supplies, EV Charger, UPS



MECHANICAL DATA

- Case: TO-247 Package
- Terminals: Solderable per MIL-STD-202, Method 208



RoHS

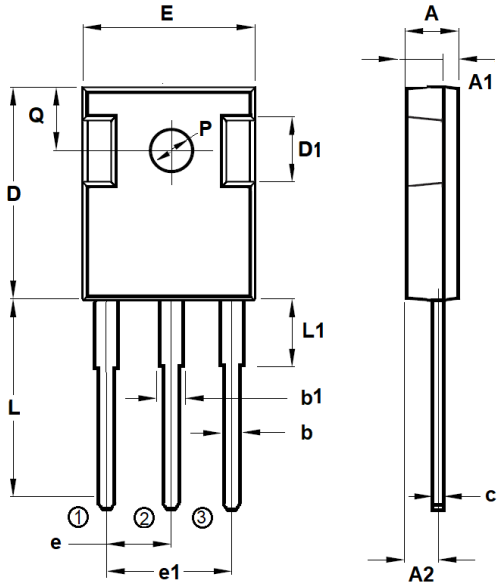
MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Drain Current – Continuous	T_C=25°C	I_D	70	A
	T_C=100°C		49	A
Drain Current – Pulsed		I_{DM}	210	A
Power Dissipation		P_D	488	W
Single Pulsed Avalanche Energy		E_{AS}	2117	mJ
Single Pulsed Avalanche Current		I_{AS}	7	A
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	0.31	°C/W
Operating Junction Temperature		T_J	150	°C
Storage Temperature Range		T_{STG}	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.80	5.25
A1	1.90	2.20
A2	2.20	2.60
b	1.00	1.40
b1	2.80	3.40
c	0.50	0.70
D	20.80	21.20
D1	4.32	5.10
E	15.70	16.20
e	5.44	
e1	10.88	
L	19.80	20.35
L1	4.00	4.50
P	3.65	5.50
Q	5.30	6.30

Note: Pin Layout: 1: Gate(G), 2: Drain(D), 3: Source(S)

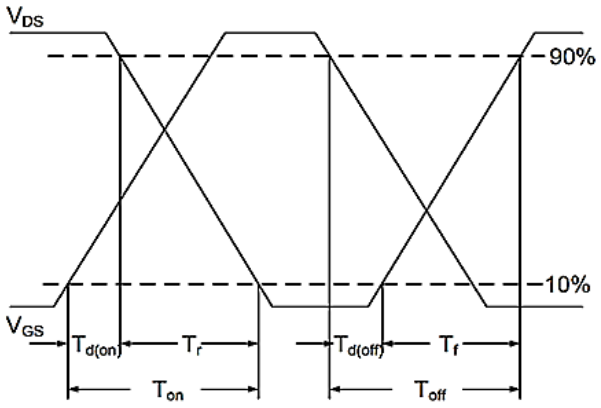


ELECTRICAL CHARACTERISTICS

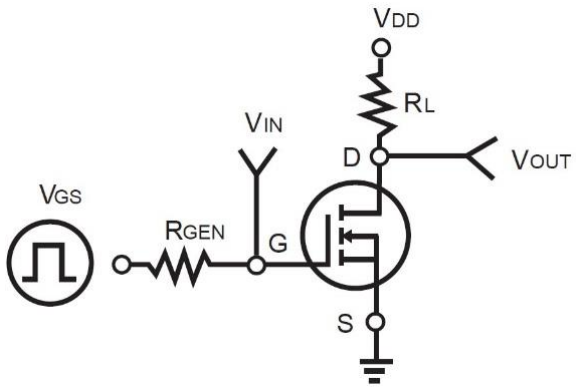
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	650	--	--	V
Drain-Source Leakage Current	V_{DS}=650V, V_{GS}=0V	I_{DSS}	--	--	5	μA
Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	--	--	±200	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=35A	$R_{DS(ON)}$	--	30	36	mΩ
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=3mA	$V_{GS(th)}$	3	--	5	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=400V, V_{GS}=10V, I_D=40A	Q_g	--	102	--	nC
Gate-Source Charge		Q_{gs}	--	24	--	
Gate-Drain Charge		Q_{gd}	--	34	--	
Turn-On Delay Time	V_{DD}=380V, V_{GS}=10V, R_G=4Ω I_D=40A	$T_{d(on)}$	--	54	--	ns
Rise Time		T_r	--	37	--	
Turn-Off Delay Time		$T_{d(off)}$	--	127	--	
Fall Time		T_f	--	5	--	
Input Capacitance	V_{DS}=50V, V_{GS}=0V, F=1MHz	C_{iss}	--	5410	--	pF
Output Capacitance		C_{oss}	--	312	--	
Reverse Transfer Capacitance		C_{rss}	--	4.1	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Drain-Source Diode Forward Current	--	I_S	--	--	70	A
Diode Forward Voltage	V_{GS}=0V, I_S=70A	V_{SD}	--	--	1.2	V
Reverse Recovery Time	I_F=40A,di/dt=100A/μs, T_J=25°C	T_{rr}	--	185	--	ns
Reverse Recovery Charge		Q_{rr}	--	1.6	--	μC

Note:
1. T_A=25°C, unless otherwise noted
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

Switching Time Waveform

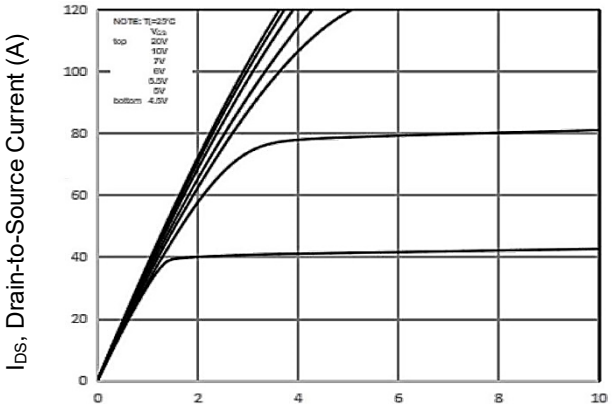


Switching Test Circuit

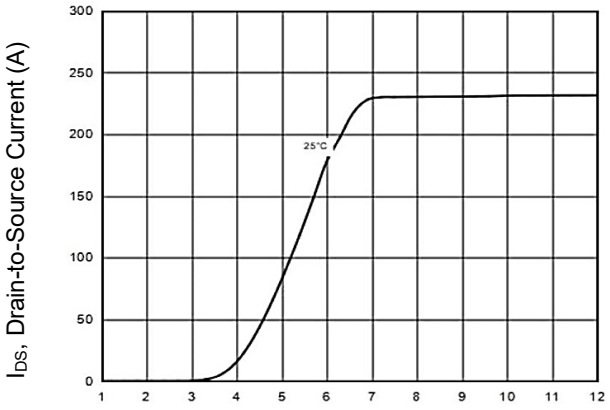


CHARACTERISTIC CURVES

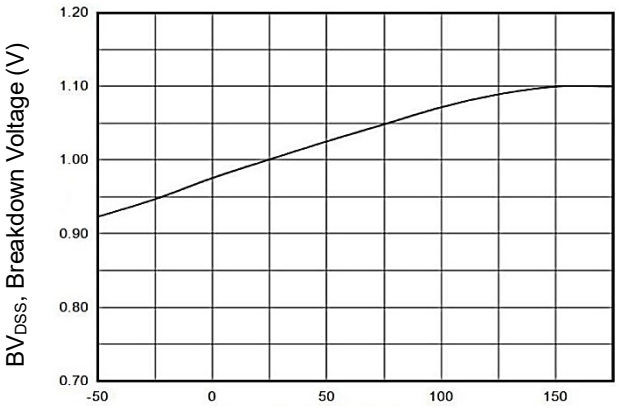
Output Characteristics



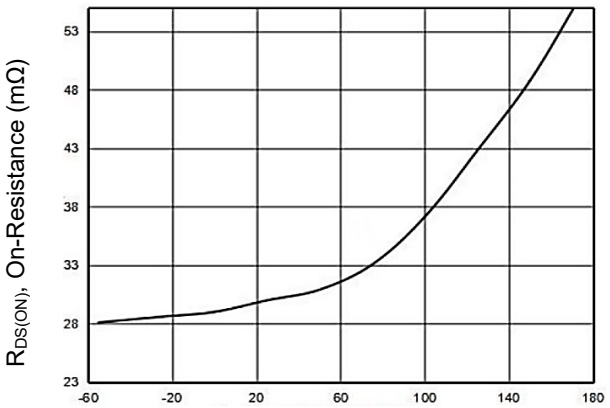
Transfer Characteristics



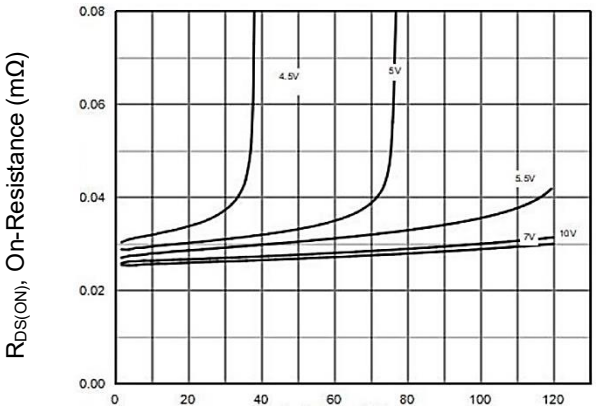
Breakdown Voltage vs. Temperature



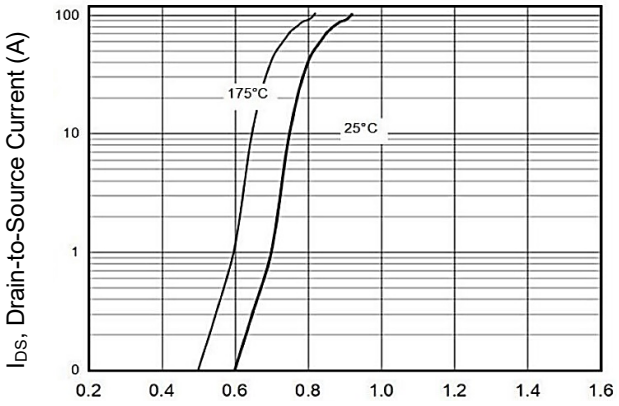
On-Resistance vs. Junction temperature



On-Resistance vs. Drain Current

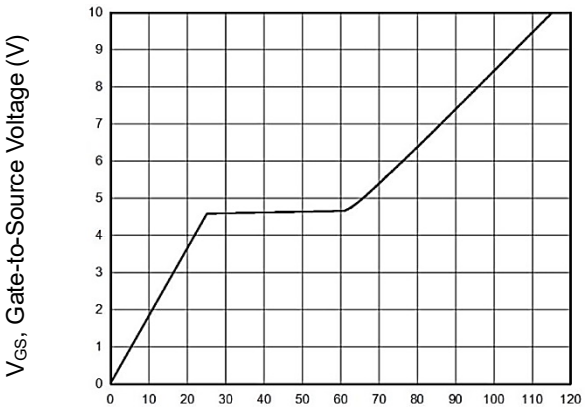


Body Diode Characteristics

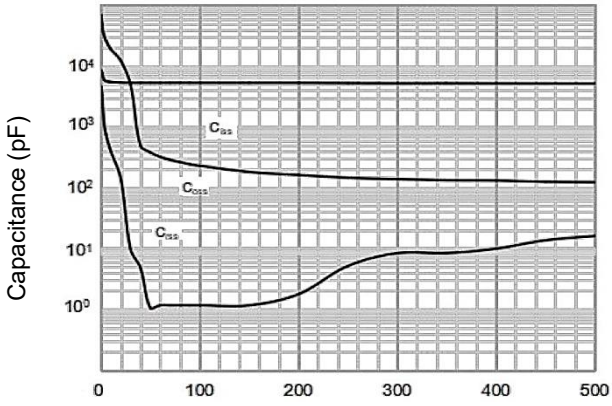


CHARACTERISTIC CURVES

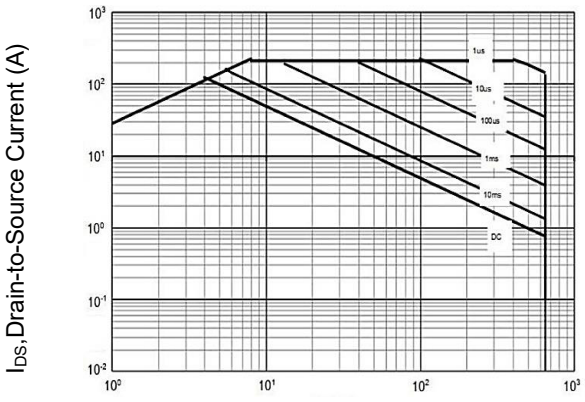
Gate-Charge Characteristics



Typical Capacitance



Maximum Safe Operating Area



Drain Current vs. Junction temperature