

N-Channel MOSFET

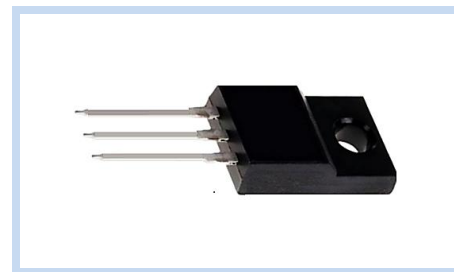
650V 15A 48W TO-220F

MFT65N15T220F

MERITEK

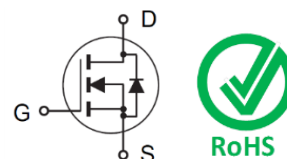
FEATURE

- $R_{DS(ON)} < 0.28\Omega$ at $V_{GS}=10V$, $I_D=7.5A$
- High Power and Current Handling Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- RoHS compliant



MECHANICAL DATA

- Case: TO-220F Package
- Terminals: Solderable per MIL-STD-750, Method 2026

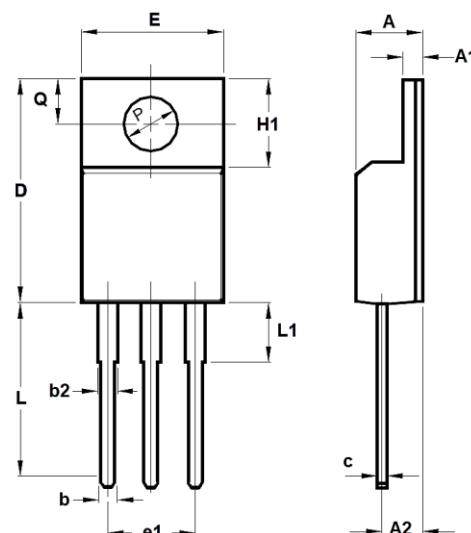


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	600	V
Gate-Source Voltage		V_{GS}	± 30	V
Drain Current – Continuous	$T_C=25^\circ\text{C}$	I_D	15	A
	$T_C=100^\circ\text{C}$		9.6	A
Drain Current – Pulsed	$T_C=25^\circ\text{C}$	I_{DM}	60	A
Power Dissipation	$T_C=25^\circ\text{C}$	P_D	48	W
	Derate above 25°C		0.38	W/ $^\circ\text{C}$
Single Pulsed Avalanche Energy		E_{AS}	400	mJ
Single Pulsed Avalanche Current		I_{AS}	4	A
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	65	$^\circ\text{C/W}$
Thermal Resistance Junction to Case		$R_{\theta JC}$	2.6	$^\circ\text{C/W}$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.50	5.00
A1	2.34	2.74
A2	2.55	2.95
b	0.70	0.95
b2	1.00	1.50
c	0.42	0.70
D	15.67	16.07
E	9.96	10.36
e1	4.68	5.48
H1	6.48	6.90
L	12.08	13.48
L1	2.35	3.65
Q	3.10	3.50
P	2.98	3.38



N-Channel MOSFET

650V 15A 48W TO-220F

MFT65N15T220F

MERITEK

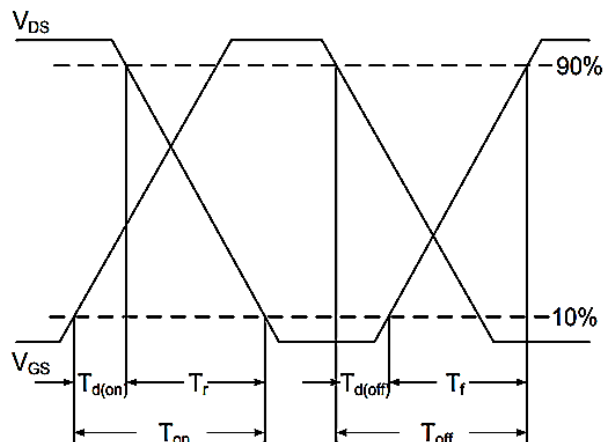
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	600	--	--	V
Drain-Source Leakage Current	$V_{DS}=600V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Body Leakage Current, Forward	$V_{GS}=30V, V_{DS}=0V$	I_{GSSF}	--	--	100	nA
Gate-Body Leakage Current, Reverse	$V_{GS}=-30V, V_{DS}=0V$	I_{GSSR}	--	--	-100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=7.5A$	$R_{DS(ON)}$	--	0.46	0.28	Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	2.5	--	4.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=400V, V_{GS}=10V, I_D=1A$	Q_g	--	25	--	nC
Gate-Source Charge		Q_{gs}	--	4	--	
Gate-Drain Charge		Q_{gd}	--	12	--	
Turn-On Delay Time	$V_{DD}=400V, V_{GS}=15V, R_G=10\Omega$ $I_D=7.5A$	$T_{d(on)}$	--	45	--	ns
Rise Time		T_r	--	23	--	
Turn-Off Delay Time		$T_{d(off)}$	--	199	--	
Fall Time		T_f	--	10	--	
Input Capacitance	$V_{DS}=150V, V_{GS}=0V, F=1MHz$	C_{iss}	--	870	--	pF
Output Capacitance		C_{oss}	--	65	--	
Reverse Transfer Capacitance		C_{rss}	--	10	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	--	--	15	A
Diode Forward Voltage	$V_{GS}=0V, I_S=7.5A, T_J=25^\circ C$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_D = 100A, di/dt = 75A/\mu s$	T_{rr}	--	253	--	ns
Reverse Recovery Charge		Q_{rr}	--	2.71	--	μC
Peak Reverse Recovery Current		I_{rr}	--	17.7	--	A

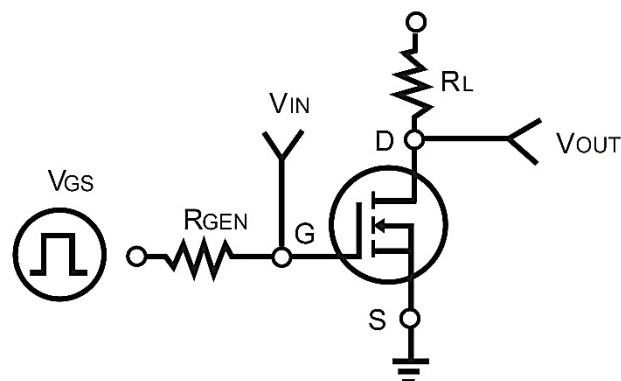
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
3. Guaranteed by design, not subject to production testing.
4. Limited only by maximum temperature allowed.
5. Pulse Width Limited by safe operating area.
6. Full package $I_{S(max)} = 8.3A$
7. Full package V_{SD} test condition $I_S = 8.3A$.
8. $L=50mH, I_{AS} = 4A, V_{DD}= 50V, R_G=25\Omega$, Starting $T_J=25^\circ C$

Switching Time Waveform

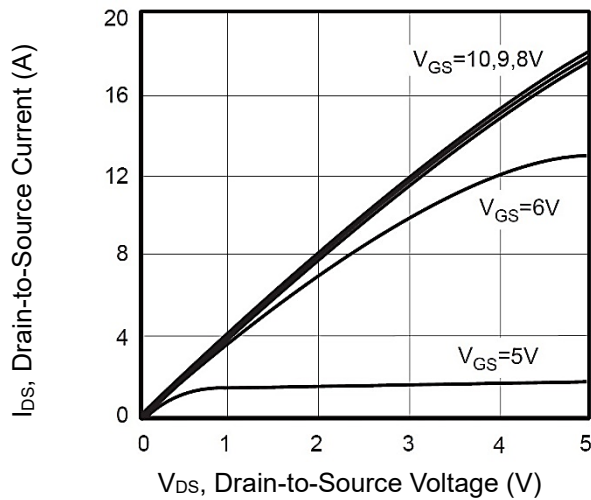


Switching Test Circuit

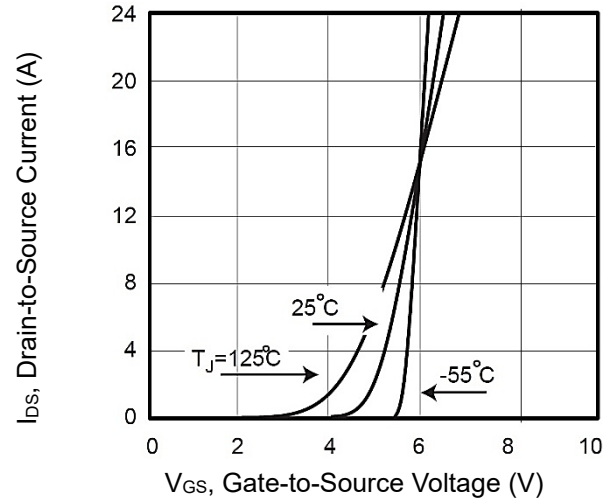


CHARACTERISTIC CURVES

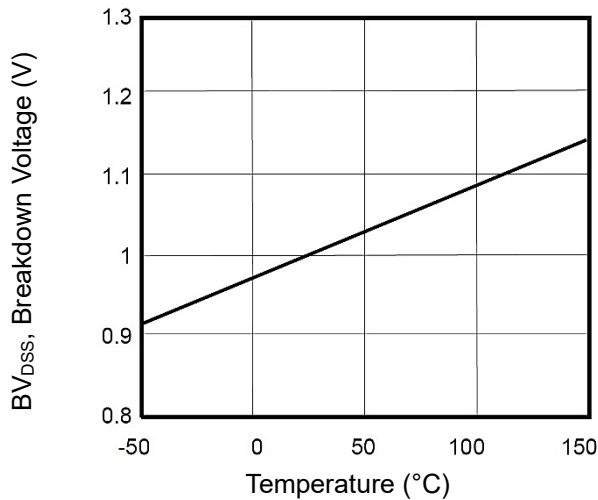
Output Characteristics



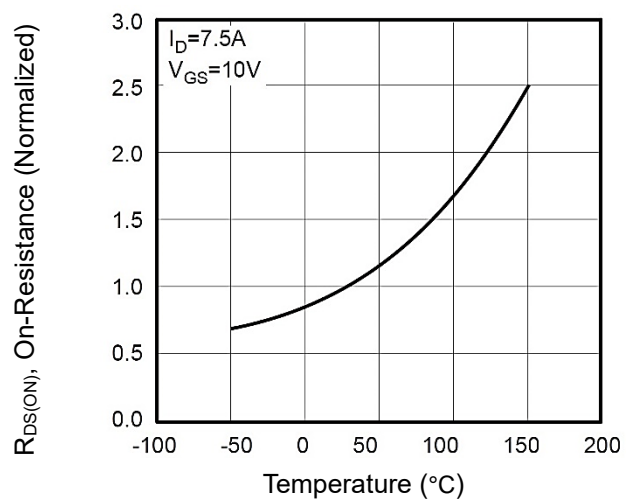
Transfer Characteristics



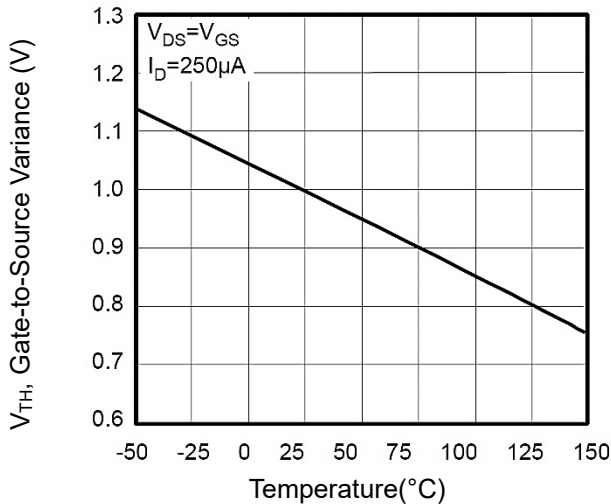
Breakdown Voltage vs. Temperature



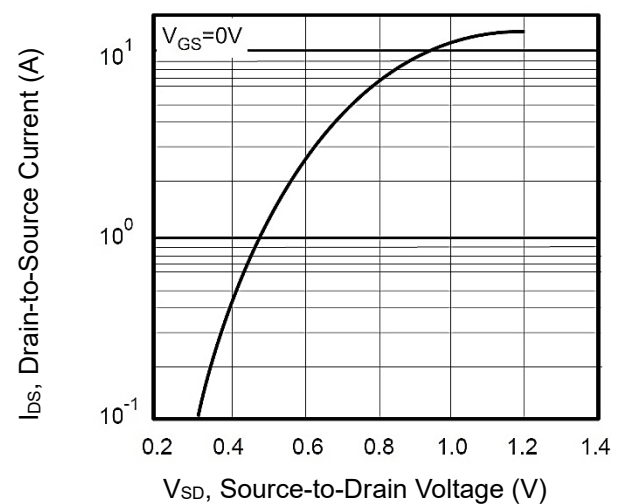
On-Resistance vs. Junction temperature



Threshold Voltage Variation with Temperature



Body Diode Characteristics



N-Channel MOSFET

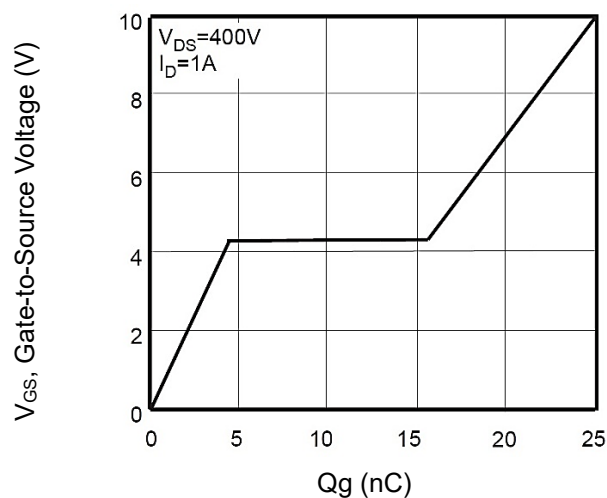
650V 15A 48W TO-220F

MFT65N15T220F

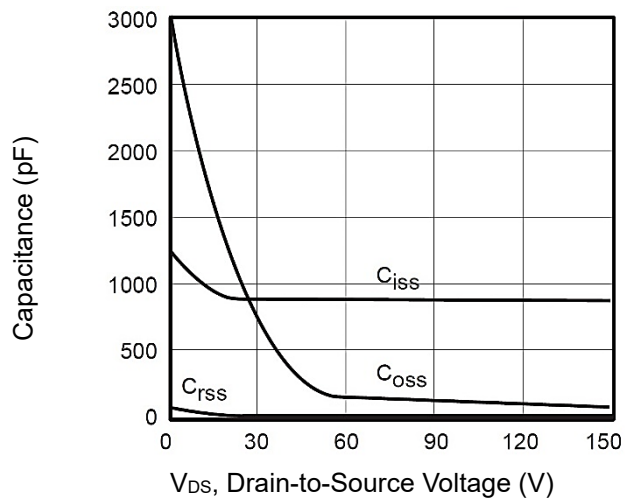
MERITEK

CHARACTERISTIC CURVES

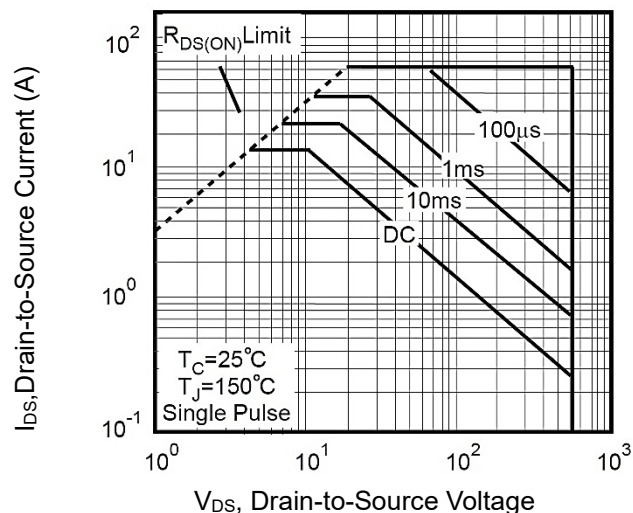
Gate-Charge Characteristics



Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area



Normalized Transient Thermal Impedance vs Pulse Width

