

N-Channel MOSFET

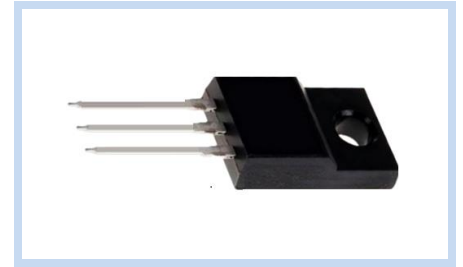
600V 22A 50W TO-220F

MFT60N22T220F

MERITEK

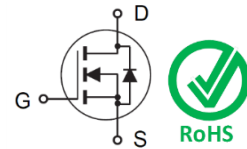
FEATURE

- $R_{DS(ON)} \leq 130m\Omega$ at $V_{GS}=10V$, $I_D=6.8A$
- High Power and Current Handing Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Applications: PC Power, EV Charging, Telecom, Server Power



MECHANICAL DATA

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

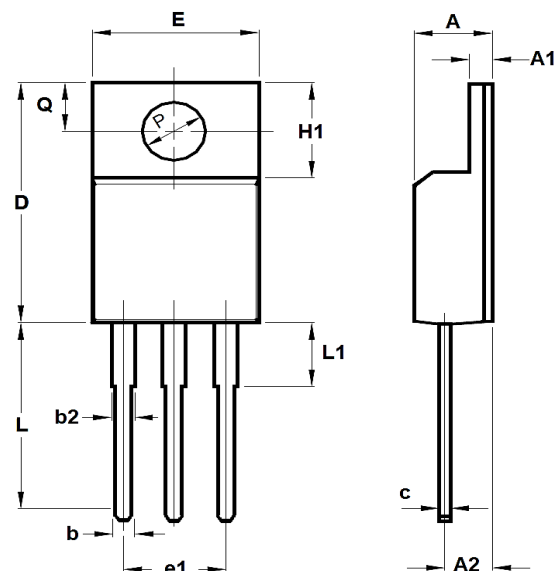


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current – Continuous	I_D	$T_C=25^\circ C$	22
		$T_C=100^\circ C$	13
Drain Current – Pulsed	I_{DM}	88	A
Power Dissipation	P_D	$T_C=25^\circ C$	50
		Derate above $25^\circ C$	0.4
Single Pulsed Avalanche Energy	E_{AS}	81	mJ
Single Pulsed Avalanche Current	I_{AS}	4.5	A
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	65	$^\circ C/W$
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.5	$^\circ C/W$
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 to 150	$^\circ C$

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	2.23	3.65
Q	3.10	3.50
P	2.98	3.38



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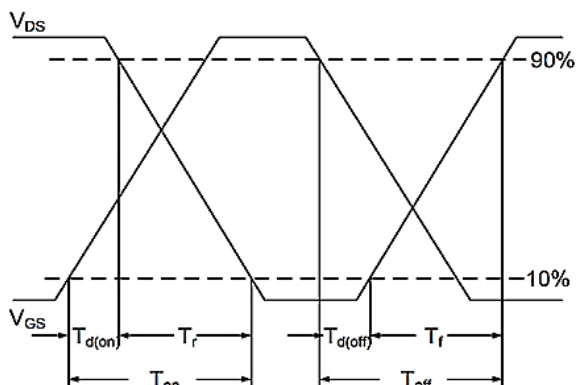
ELECTRICAL CHARACTERISTICS

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}	--	--	5	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	$V_{GS}=10V, I_D=6.8A$	$R_{DS(ON)}$	--	108	130	m Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	3	--	5	V
Gate Input Resistance	F=1MHz, Open Drain	R_g	--	5.8	--	Ω
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=300V, V_{GS}=10V, I_D=6A$	Q_g	--	39	--	nC
Gate-Source Charge		Q_{gs}	--	9.6	--	
Gate-Drain Charge		Q_{gd}	--	15	--	
Turn-On Delay Time	$V_{DD}=300V, V_{GS}=10V, R_G=6\Omega, I_D=6A$	$T_{d(on)}$	--	36	--	ns
Rise Time		T_r	--	9.3	--	
Turn-Off Delay Time		$T_{d(off)}$	--	72.2	--	
Fall Time		T_f	--	15	--	
Input Capacitance	$V_{DS}=150V, V_{GS}=0V, F=1MHz$	C_{iss}	--	1630	--	pF
Output Capacitance		C_{oss}	--	75	--	
Reverse Transfer Capacitance		C_{rss}	--	15	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	--	--	22	A
Diode Forward Voltage	$V_{GS}=0V, I_S=6A$	V_{SD}	--	--	1.5	V
Reverse Recovery Time	$I_F=6A, di/dt=100A/\mu s$	T_{rr}	--	132	--	ns
Reverse Recovery Charge		Q_{rr}	--	0.52	--	μC
Peak Reverse Recovery Current		I_{rr}	--	6.26	--	A

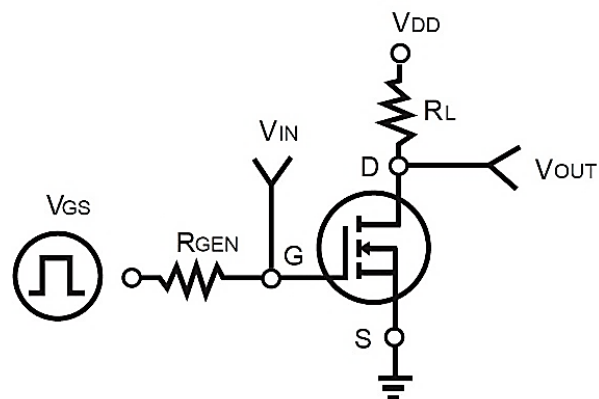
Note:

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 $I_{S(max)} = 12A$
7. $L=8mH, I_{AS} = 4.5A, V_{DD}=60V, R_G=25\Omega$, Starting $T_J=25^\circ C$

Switching Time Waveform

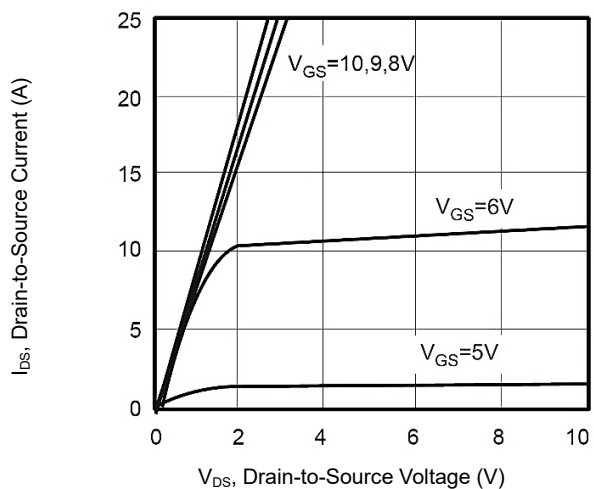


Switching Test Circuit

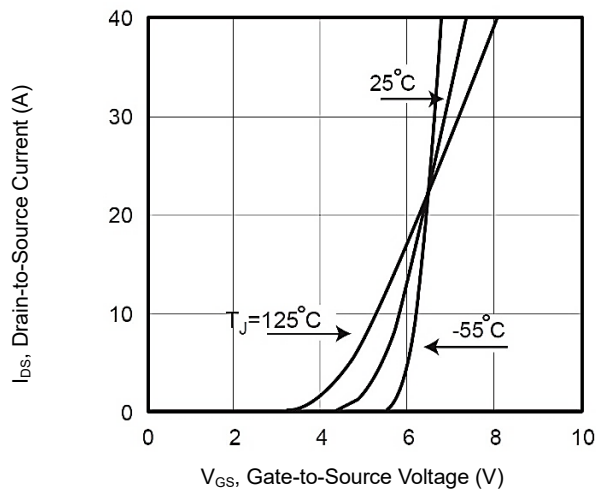


CHARACTERISTIC CURVES

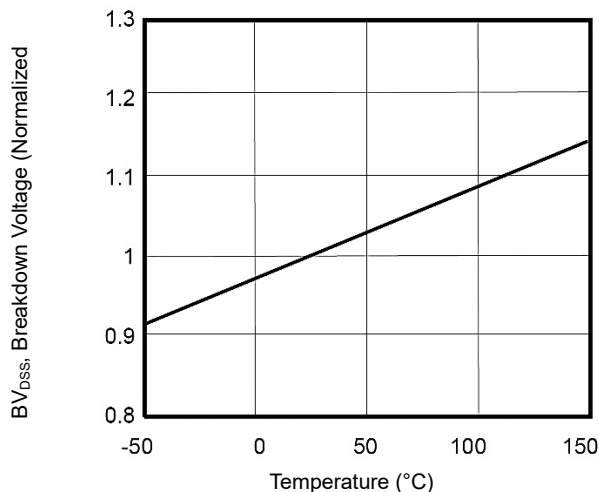
Output Characteristics



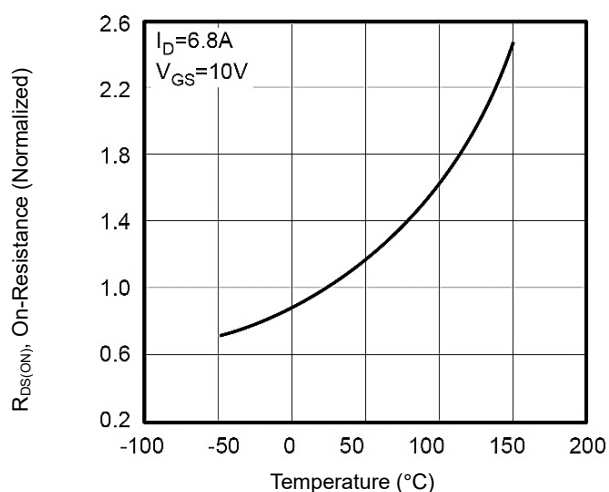
Transfer Characteristics



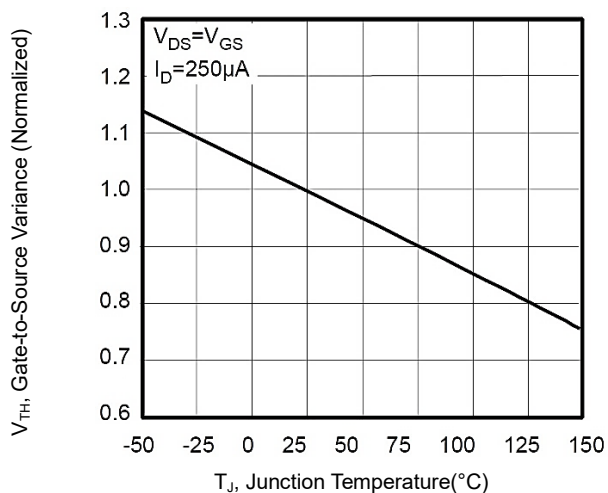
Breakdown Voltage vs. Temperature



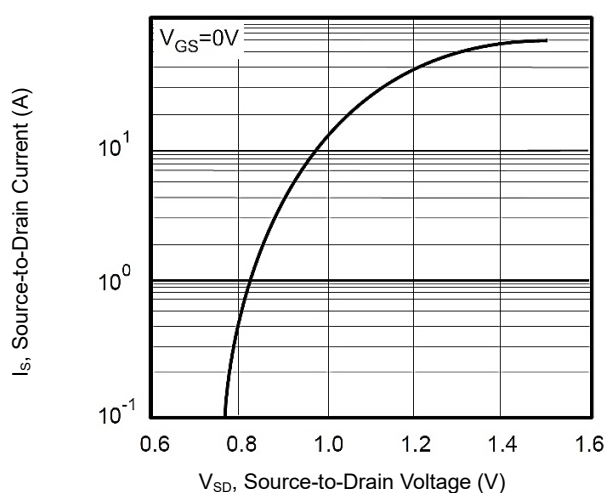
On-Resistance vs. Junction temperature



Threshold Voltage Variation with Temperature

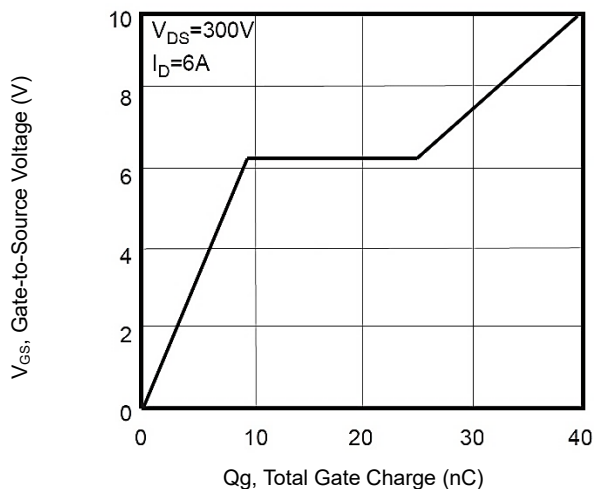


Body Diode Characteristics

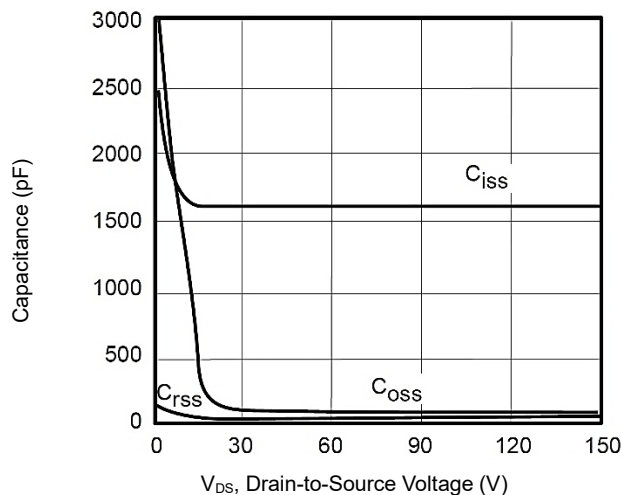


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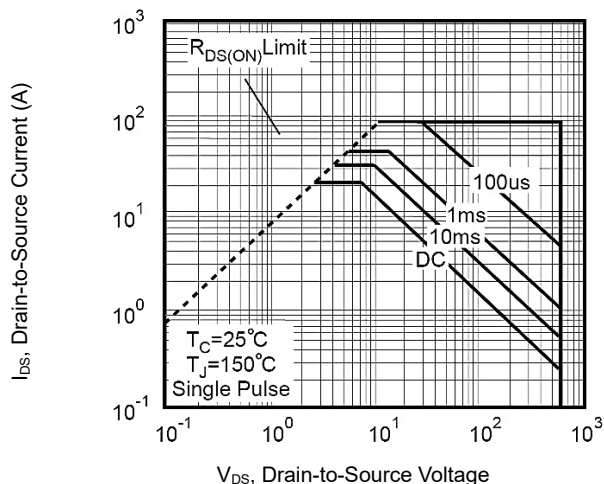
Gate-Charge Characteristics



Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area



Normalized Transient Thermal Impedance vs Pulse Width

