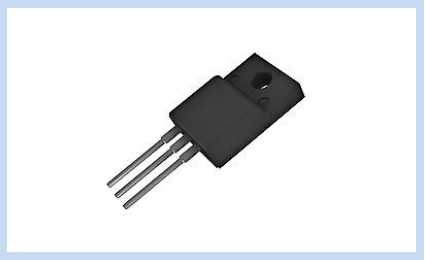
N-Channel MOSFET
650V 11A 40W TO-220F

MFT65N11T220F

MERITEK

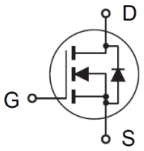
FEATURES



- $R_{DS(ON)}$≤380mΩ at V_{GS}=10V
- Super Junction technology designed to minimize on-resistance in high-voltage operations
- Advanced Thermal Management Package with Low Thermal Resistance
- Fast switching performance, low switching losses and high-frequency efficiency

APPLICATIONS

- AI Data Centers & Server: AC-DC power stages, auxiliary power , and server PSU architectures
- EV Charging Infrastructure: power conversion stages in L2 chargers, and auxiliary power
- Renewable Energy & Energy Storage: solar inverters, BESS, smart power management
- Industrial Automation: LED drivers, motor drives, robotics, factory automation



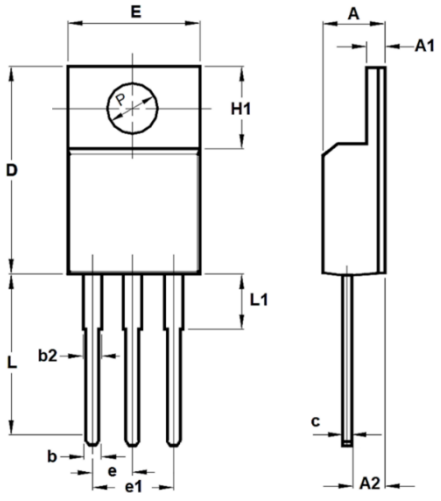
RoHS

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	±30	V
Drain Current – Continuous	V_{GS}=10V	I_D	11	A
	V_{GS}=10V , T_C=100°C		6.9	
Drain Current – Pulsed		I_{DM}	24	A
Power Dissipation	T_C=25°C	P_D	40	W
Single Pulsed Avalanche Energy		E_{AS}	121.8	mJ
Thermal Resistance from Junction to Ambient		$R_{\theta JC}$	40	°C/W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	3.1	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.50	4.90
A1	2.34	2.74
A2	2.60	2.95
b	0.70	0.90
b2	1.12	1.42
c	0.40	0.60
D	15.50	16.10
E	9.70	10.30
e	2.34 Typ	
e1	4.68 Typ	
H1	6.51	6.71
L	12.60	13.60
L1	2.70	3.20
P	3.00	3.30



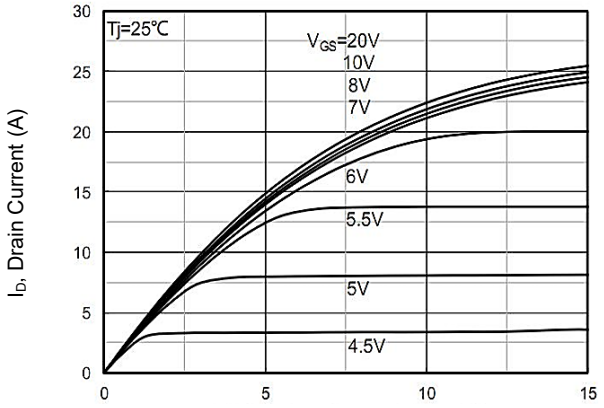
ELECTRICAL CHARACTERISTICS

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}	--	--	1	μA
Gate-Body Leakage Current,	V_{GS}=±30V, V_{DS}=0V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=5A	$R_{DS(ON)}$	--	300	380	mΩ
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	$V_{GS(th)}$	2.2	3	3.8	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=325V, V_{GS}=10V, I_D=8.5A	Q_g	--	13.7	--	nC
Gate-Source Charge		Q_{gs}	--	3	--	
Gate-Drain Charge		Q_{gd}	--	5.7	--	
Turn-On Delay Time	V_{DS}=325V, V_{GS}=10V, I_D=8.5A, R_g=3Ω,	$T_{d(on)}$	--	30	--	nS
Rise Time		T_r	--	23	--	
Turn-Off Delay Time		$T_{d(off)}$	--	18	--	
Fall Time		T_f	--	13	--	
Input Capacitance	V_{DS}=325V, V_{GS}=0V, F=1MHz	C_{iss}	--	625	--	pF
Output Capacitance		C_{oss}	--	4.7	--	
Reverse Transfer Capacitance		C_{rss}	--	1.3	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Drain-Source Diode Forward Current	--	I_S	--	--	11	A
Diode Forward Voltage	V_{GS}=0V, I_S=8.7A	V_{SD}	--	--	1.2	V
Reverse Recovery Time	V_{GS}=0V, V_R=325V, I_F=8.5A, di/dt = 100A/μs	T_{rr}	--	208	--	nS
Reverse Recovery Charge		Q_{rr}	--	2086	--	nC
Peak Reverse Recovery Current		I_{rrm}	--	19	--	A

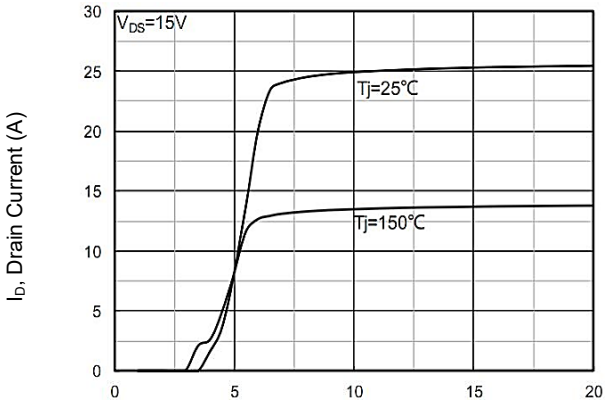
Note:
1. T_A =25°C unless otherwise noted
2. Thermal resistance from junction to soldering point
3. E_{AS} Condition:T_J=25℃, V_G=10V, R_G=25Ω, L=30mH, I_{AS}=2.85A

CHARACTERISTIC CURVES

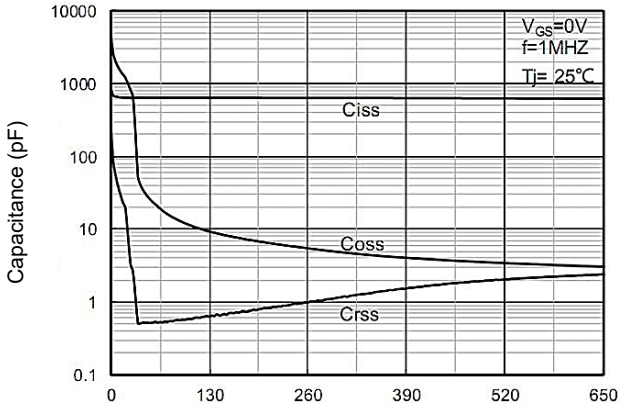
Output Characteristic



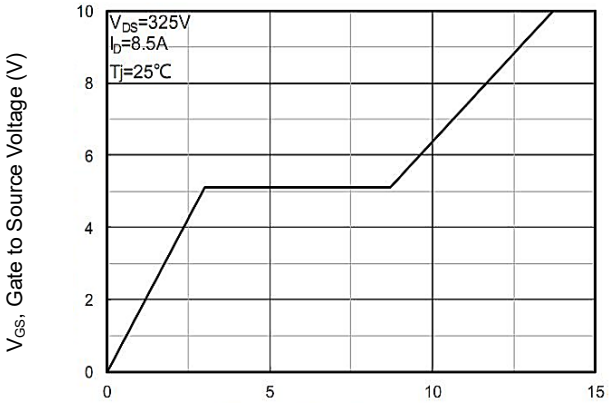
Transfer Characteristics



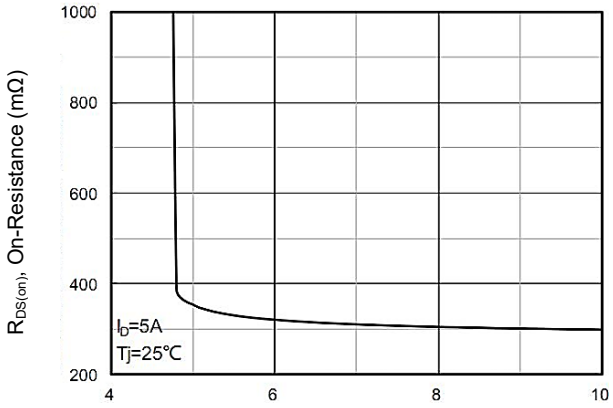
Capacitance



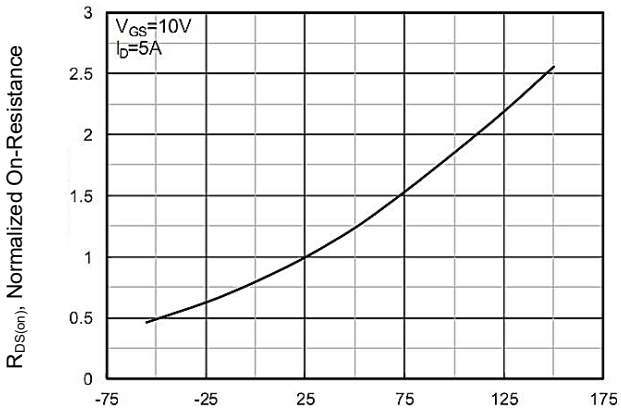
Gate Charge Waveform



On-Resistance vs. Gate to Source Voltage

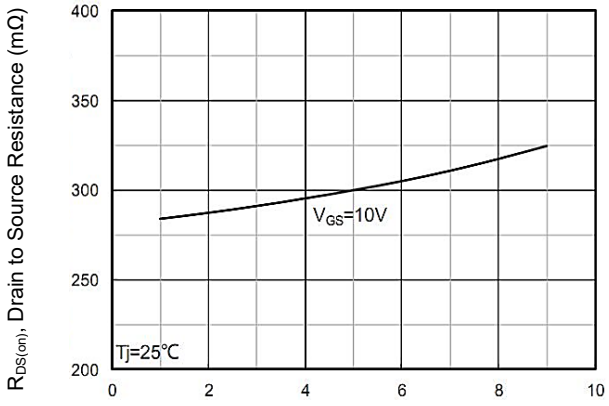


On-Resistance vs. Junction Temperature

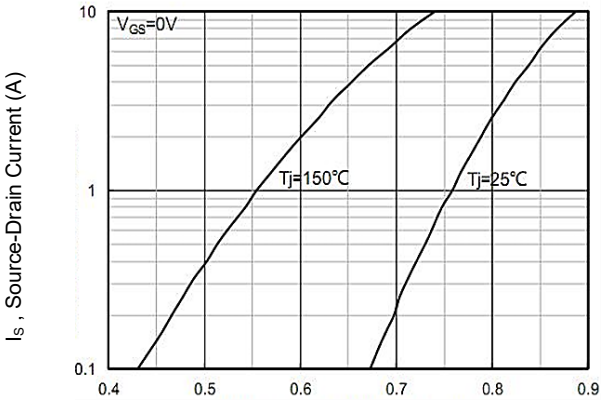


CHARACTERISTIC CURVES

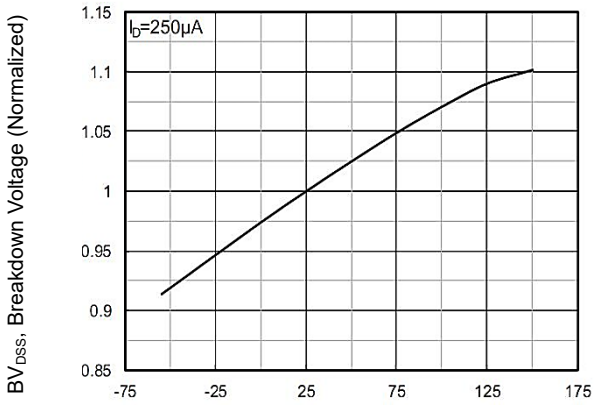
On-Resistance vs. Drain Current



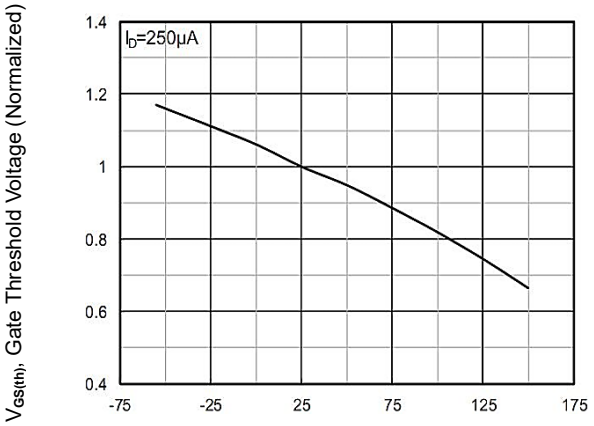
Body Diode Forward Voltage



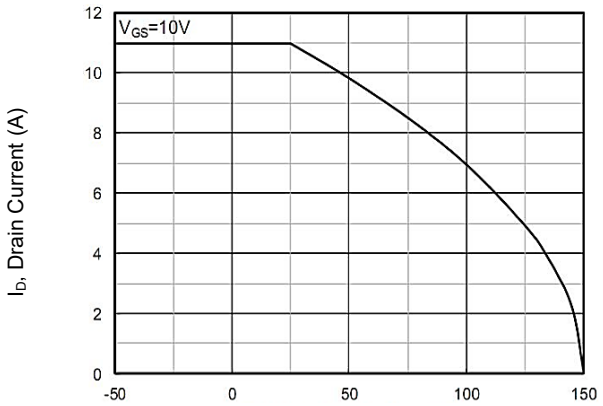
Breakdown Voltage vs Junction Temperature



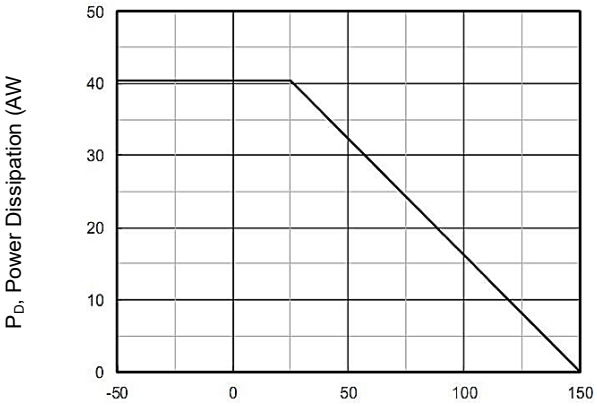
Gate Threshold Voltage vs Junction Temperature



Current Dissipation

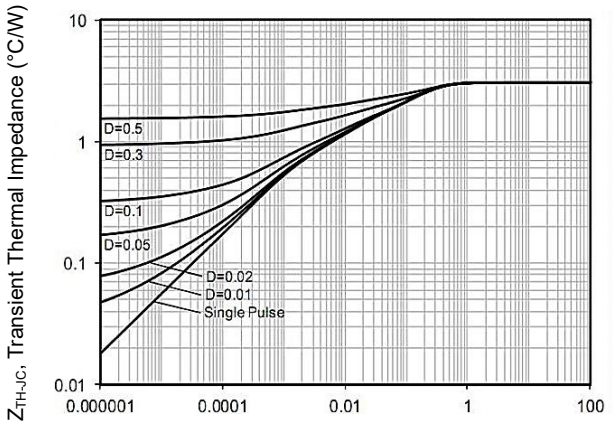


Power Dissipation



CHARACTERISTIC CURVES

Maximum Transient Thermal Impedance



Maximum Safe Operating Area

