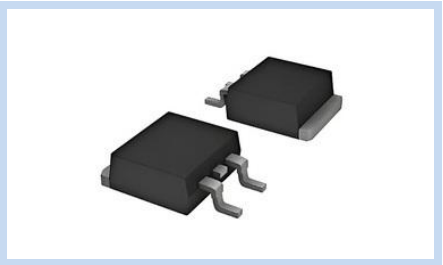
N-Channel MOSFET
60V 90A TO-252

MFT6N90T252

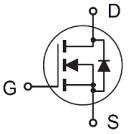
MERITEK

FEATURES



- $R_{DS(ON)}$<5.9mΩ at V_{GS}=10V
- $R_{DS(ON)}$<7.6mΩ at V_{GS}=4.5V
- Fast Switching
- Low Gate Charge and Low On-Resistance
- Advance Split Gate Trench Technology

APPLICATIONS



RoHS

- Load Switching and High-Side / Low-Side Drivers
- Motor Control Circuit in DC, BLDC, H-Bridge Configurations
- Power Conversion: Bulk and Boost Converters, BMS, Load Regulators
- Power Inverters: Solar and High-Current Low Voltage Inverters, UPS

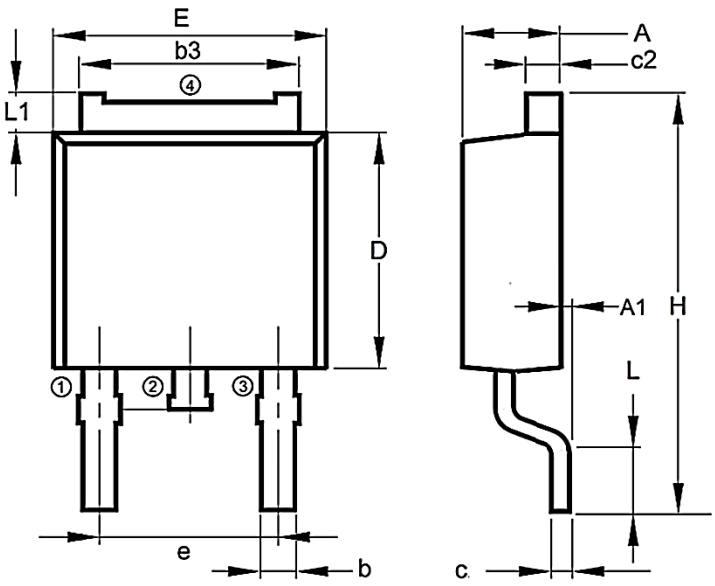
MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C=25°C	I_D	90	A
	T_C=100°C		60	
Drain Current – Pulsed		I_{DM}	360	A
Power Dissipation	T_C=25°C	P_D	78	W
Single Pulse Avalanche Energy		E_{AS}	256	mJ
Thermal Resistance, Junction to Case		$R_{\theta JC}$	2.5	°C/W
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150	°C

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	2.10	2.50
A1	0.00	0.10
b	0.66	0.86
b3	5.18	5.48
c	0.40	0.60
c2	0.44	0.58
D	5.90	6.30
E	6.40	6.80
e	4.47	4.67
H	9.50	10.70
L	1.35	1.65
L1	1.09	1.21

Note: 1: Gate, 2, 4: Drain, 3: Source



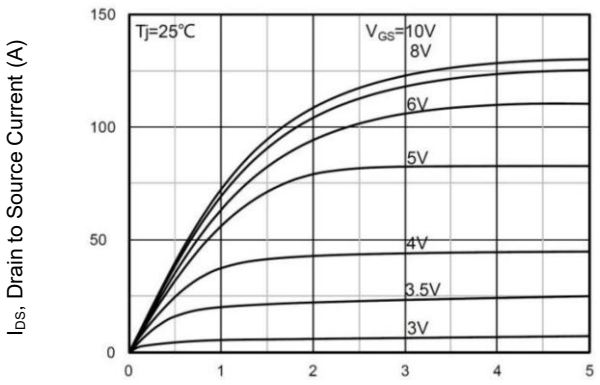
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250μA	BV_{DSS}	60	--	--	V
Drain-Source Leakage Current	V_{DS}=480V, V_{GS}=0V	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	V_{GS}=±20V, 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=20A	$R_{DS(ON)}$	--	4.9	5.9	mΩ
	V_{GS}=4.5V, I_D=10A		--	5.8	7.6	
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	$V_{GS(th)}$	1.3	1.7	2.3	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=30V, V_{GS}=10V, I_D=20A	Q_g	--	31	--	nC
Gate-Source Charge		Q_{gs}	--	6.5	--	
Gate-Drain Charge		Q_{gd}	--	10	--	
Turn-On Delay Time	V_{DD}=30V, V_{GS}=10V, R_G=4.7Ω, I_D=20A	$T_{d(on)}$	--	9	--	ns
Rise Time		T_r	--	35	--	
Turn-Off Delay Time		$T_{d(off)}$	--	32	--	
Fall Time		T_f	--	58	--	
Input Capacitance	V_{DS}=30V, V_{GS}=0V, F=1MHz	C_{iss}	--	2174	--	pF
Output Capacitance		C_{oss}	--	632	--	
Reverse Transfer Capacitance		C_{rss}	--	19	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Drain-Source Diode Forward Current	--	I_S	--	--	90	A
Diode Forward Voltage	V_{GS}=0V, I_S=-2A	V_{SD}	--	--	1.2	V
Reverse Recovery Time	I_S=20A, di/dt=100A/μs, T_J=25°C	t_{rr}	--	27	--	ns
Reverse Recovery Charge		Q_{rr}	--	39	--	nC

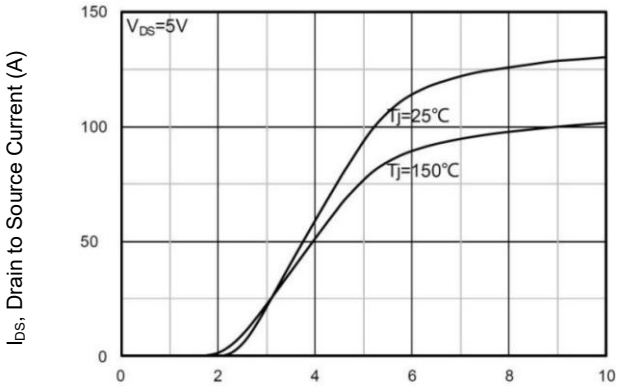
Note:
1. Power dissipation is limited by maximum junction temperature $T_{J(MAX)}$=150°C.
2. Pulse Test: Pulse Width≤ 300μs, Duty Cycle≤ 2%.
3. The E_{AS} data shows Max. rating. The test condition is L=0.5mH, R_G=25Ω, V_{GS}=10V, V_{DD}=30V.
4. Device mounted on 1 inch square FR-4 board with 2oz copper.

CHARACTERISTIC CURVES

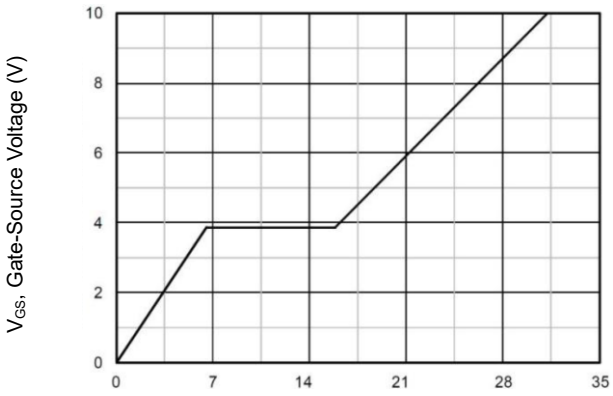
On Region Characteristics



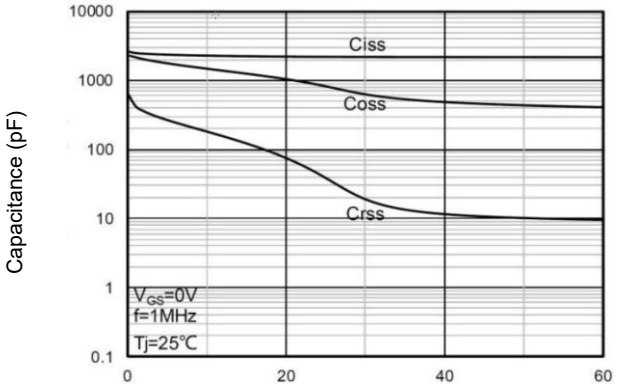
Transfer Characteristics



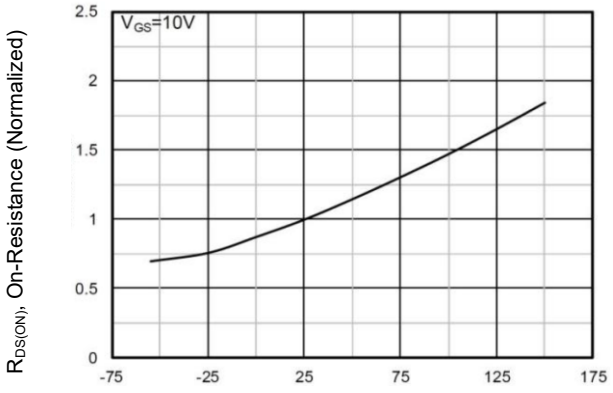
Gate Charge Characteristics



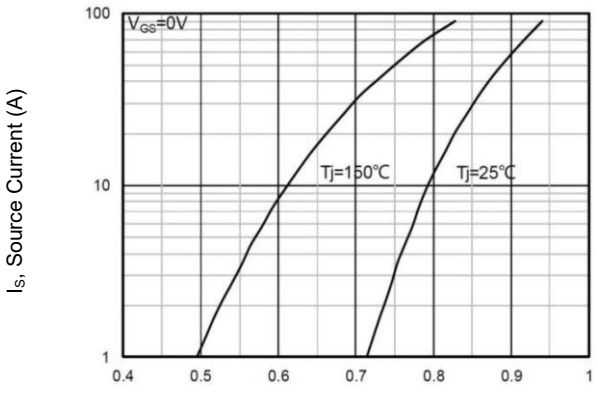
Capacitance vs. Drain-Source Voltage



On-Resistance vs. Junction temperature

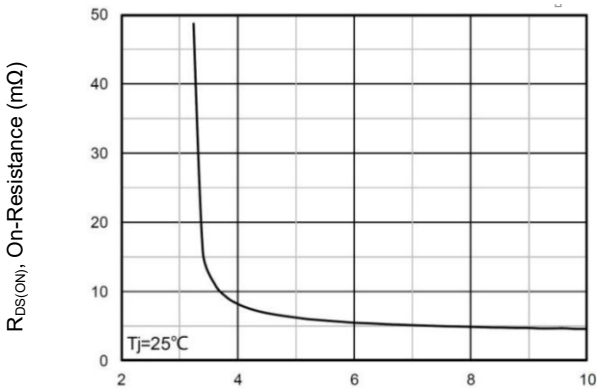


Body Diode Characteristics

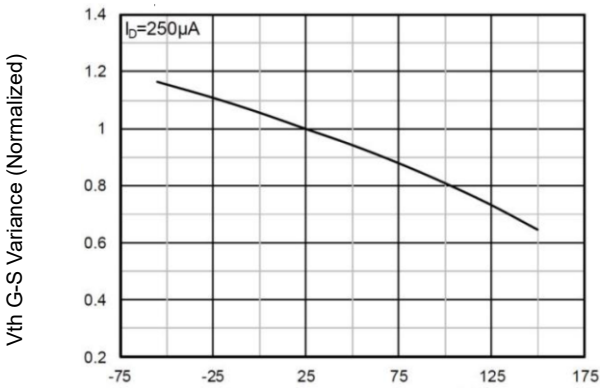


CHARACTERISTIC CURVES

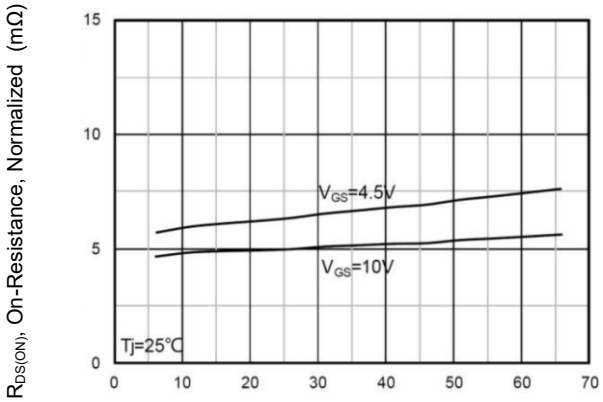
On-Resistance vs. Gate-Source Voltage



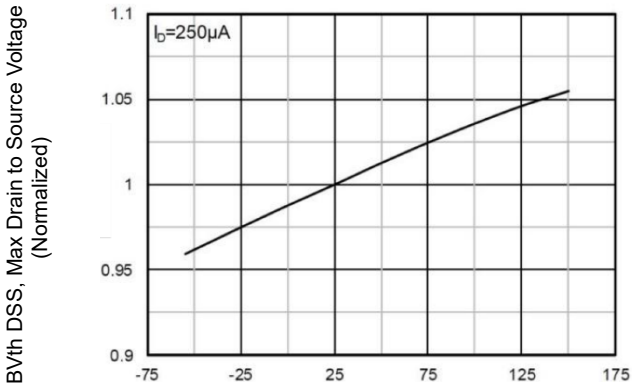
Threshold Voltage Variance vs. Temperature



On-Resistance vs. Drin Current

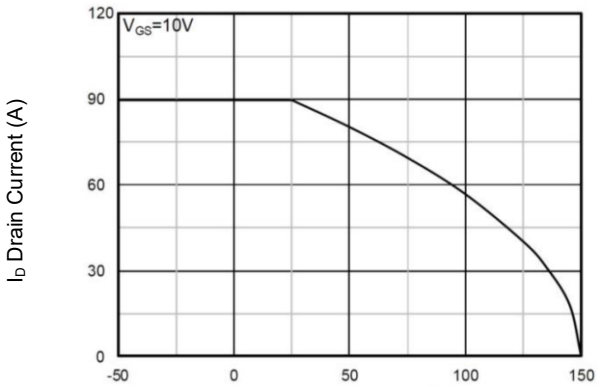


Threshold Voltage Variance vs. Temperature

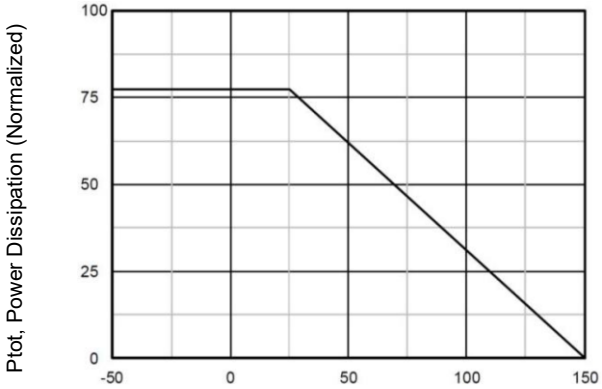


CHARACTERISTIC CURVES

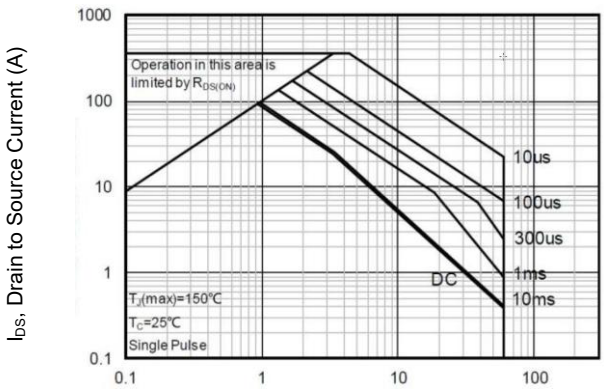
Current Dissipation



Power Dissipation



Maximum Safe Operating Area



Maximum Transient Thermal Impedance