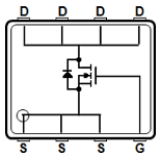
N Channel MOSFET
120V 90A 160W DFN5×6-8L

MFT12N90D56

MERITEK

FEATURE

- $R_{DS(ON)}$<9mΩ at V_{GS}=10V
- $R_{DS(ON)}$<12mΩ at V_{GS}=4.5V
- Excellent Low $R_{DS(ON)}$
- Low Gate Charge
- Application: Mobile Phone Fast Charging, Brushless Motor, Home Appliance Control Board



RoHS

MECHANICAL DATA

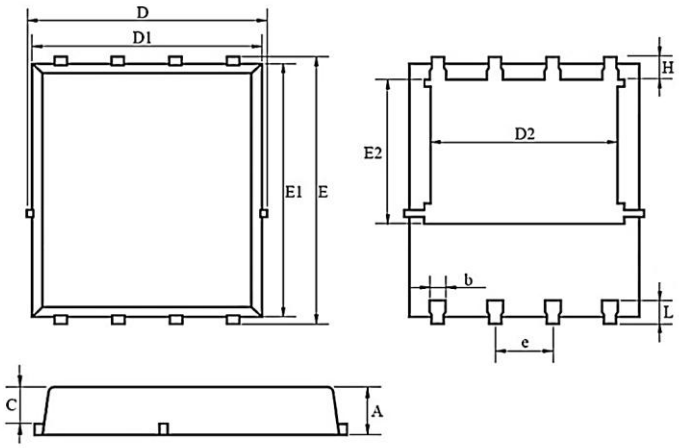
- Case: DFN5×6-8L Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	120	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C=25°C	I_D	90	A
	T_C=70°C		35	
Drain Current – Pulsed		I_{DM}	270	A
Power Dissipation	T_C=25°C	P_D	160	W
Single Pulse Avalanche Energy		E_{AS}	125	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	0.78	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	1.030	1.170
b	0.340	0.480
c	0.824	0.970
D	4.800	5.400
D1	4.800	5.000
D2	4.110	4.310
E	5.950	6.150
E1	5.650	5.850
E2	3.300	3.500
e	1.27 BSC	
L	0.380	0.500
H	0.380	0.500

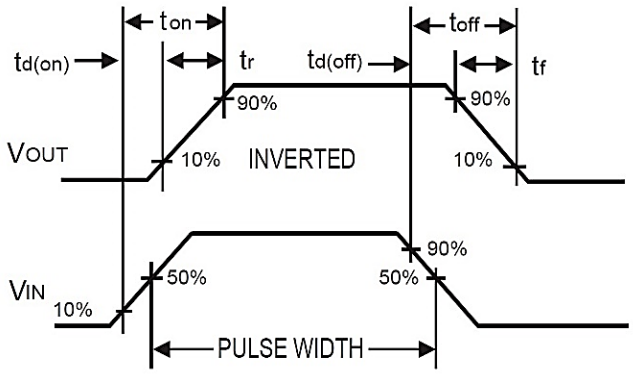


ELECTRICAL CHARACTERISTICS

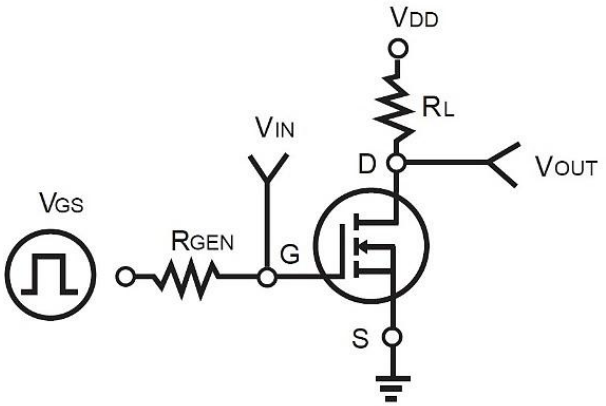
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	120	--	--	V
Drain-Source Leakage Current	V_{DS}=120V, V_{GS}=0V	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	$R_{DS(ON)}$	--	7.5	9	mΩ
	V_{GS}=6V, I_D=10A		--	9	12	
Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	$V_{GS(th)}$	1.5	2.0	2.5	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=60V, V_{GS}=10V, I_D=20A	Q_g	--	30	--	nC
Gate-Source Charge		Q_{gs}	--	5.8	--	
Gate-Drain Charge		Q_{gd}	--	6	--	
Turn-On Delay Time	V_{DS}=60V, V_{GS}=10V, R_G=3Ω, I_D=20A	$T_{d(on)}$	--	9.5	--	nS
Rise Time		T_r	--	4.2	--	
Turn-Off Delay Time		$T_{d(off)}$	--	27.2	--	
Fall Time		T_f	--	6.6	--	
Input Capacitance	V_{DS}=50V, V_{GS}=0V, F=1MHz	C_{iss}	--	1854	--	pF
Output Capacitance		C_{oss}	--	270	--	
Reverse Transfer Capacitance		C_{rss}	--	10	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Current	--	I_S	--	--	40	A
Diode Forward Voltage	V_{GS}=0V , I_S=20A	V_{SD}	--	--	1.2	V
Reverse Recovery Time	I_F=20A, di/dt=100A/μs, T_J=25°C	T_{rr}	--	52	--	ns
Reverse Recovery Charge		Q_{rr}	--	84	--	μC

Note:
1. T_J=25°C,unless otherwise noted
2. The data tested by surface mounted on 1 inch^2 FR-4 board with 2oz copper.
3. The data tested by pulsed , pulse width .The E_{AS} data shows Max. Rating
4. The power dissipation is limited by 150°C junction temperature
5. E_{AS} condition: T_J=25℃, V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=30A.

Switching Time Waveform

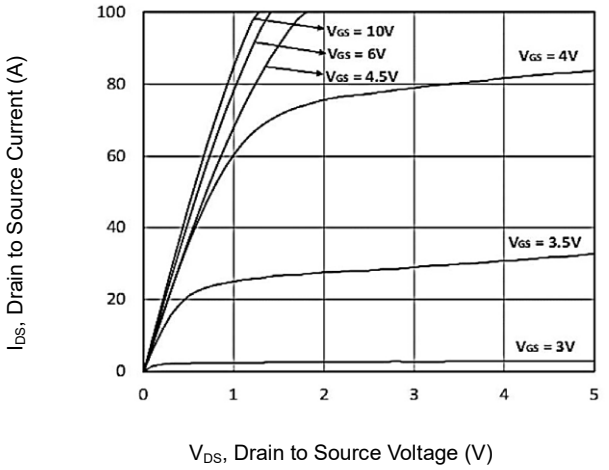


Switching Test Circuit

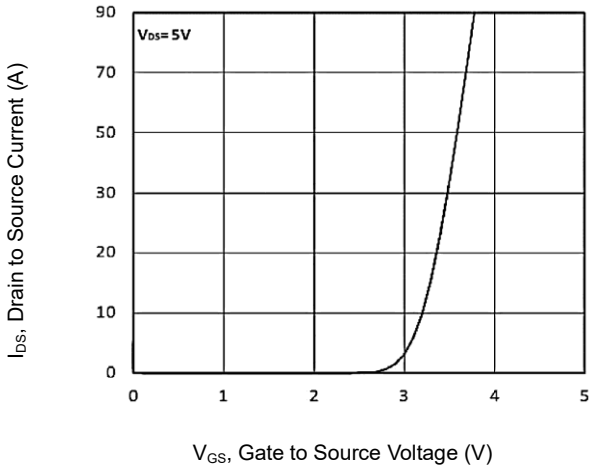


CHARACTERISTIC CURVES

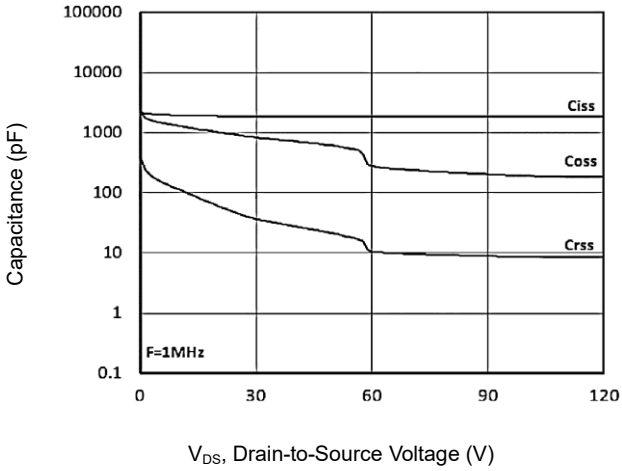
On-Region Characteristics



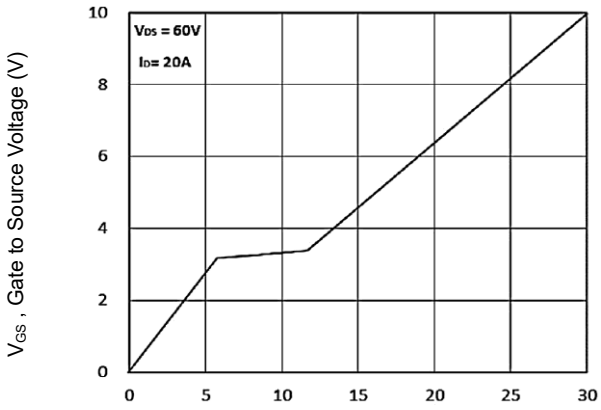
Transfer Characteristics



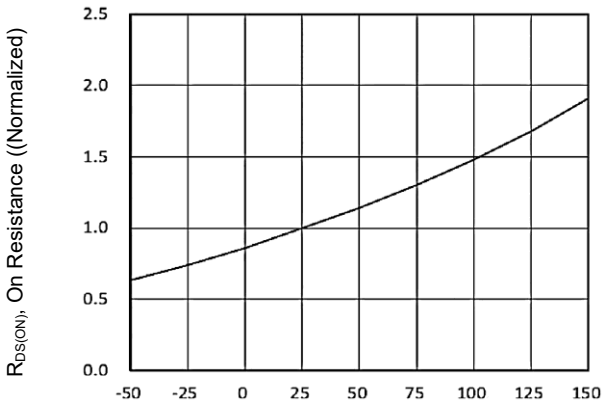
Capacitance vs. Drain-Source Voltage



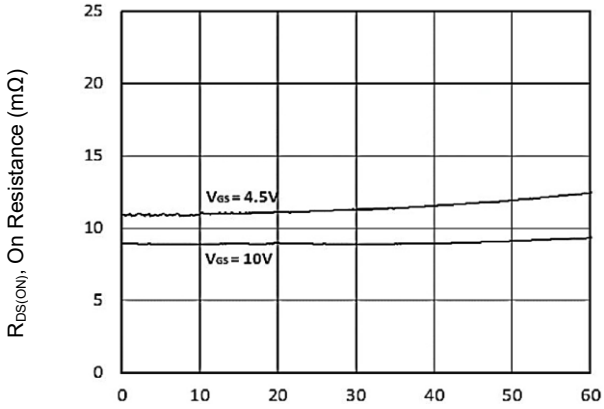
Gate Charge Waveform



On-Resistance Variation with Temperature

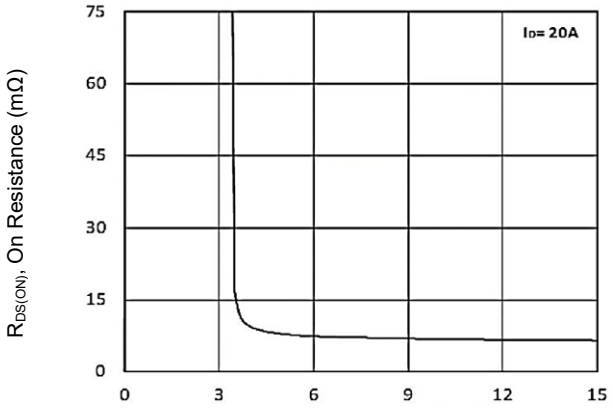


On-Resistance Variation with Drain Current

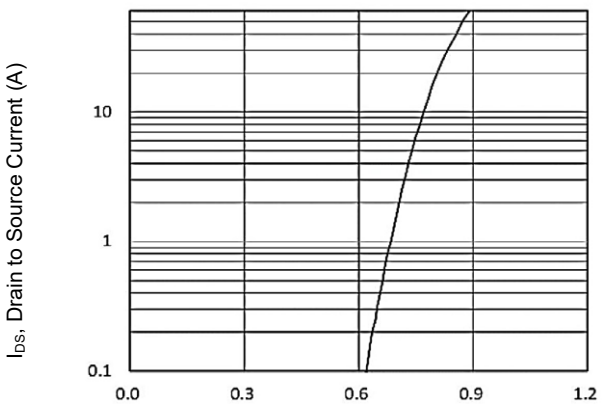


CHARACTERISTIC CURVES

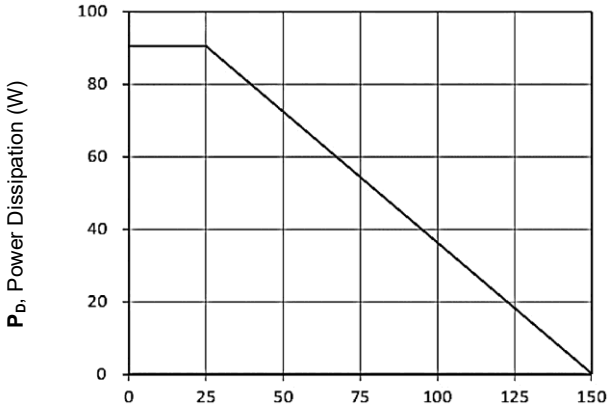
On-Resistance Variation with Gate-Source Voltage



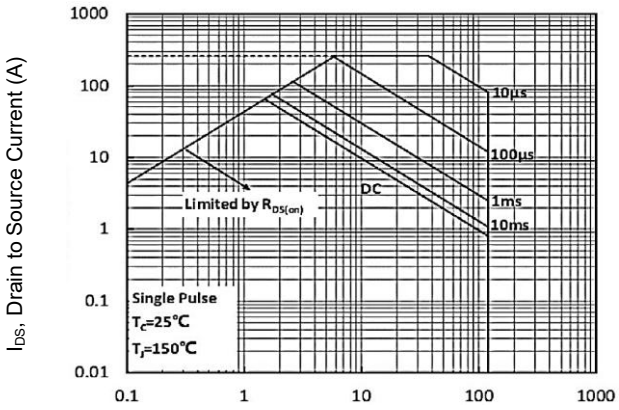
Body Diode Forward Voltage



Power Dissipation



Maximum Safe Operating Area



Normalized Transient Thermal Impedance vs Pulse Width