

N-Channel MOSFET

40V 90A 70W DFN5X6

MFT4N90D56

MERITEK

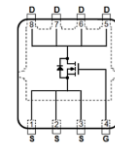
FEATURE

- $R_{DS(ON)} < 2.8m\Omega$, $V_{GS}=10V$, $I_D=55A$
- $R_{DS(ON)} < 3.9m\Omega$, $V_{GS}=4.5V$, $I_D=55A$
- Excellent Gate Charge $\times R_{DS(ON)}$ Product
- Very Low On-Resistance $R_{DS(on)}$
- Application: DC/DC Converter, Ideal for High-Frequency Switching and Synchronous Rectification



MECHANICAL DATA

- Case: Molded Plastic, DFN5060 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

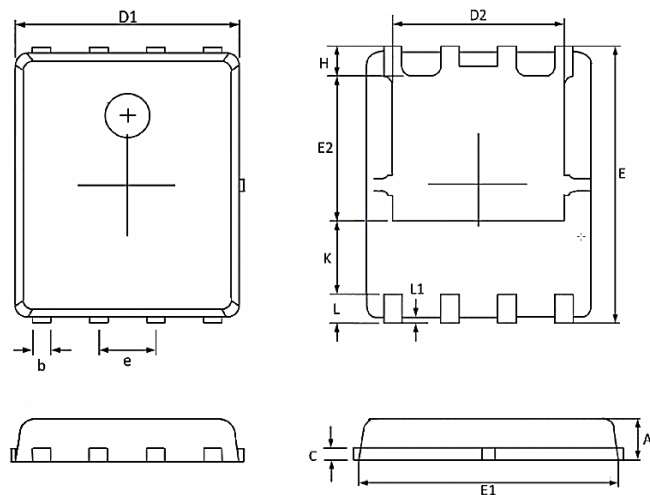


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	90	A
Drain Current – Pulsed	I_{DM}	340	A
Power Dissipation	P_D	70	W
Single Pulsed Avalanche Energy	E_{AS}	500	mJ
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.8	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.900	1.000
b	0.350	0.450
C	0.254 REF	
D1	4.944	5.096
D2	2.540 TYP	
E	5.974	6.126
E1	4.824	4.976
E2	3.375	3.575
e	1.270 TYP	
H	0.574	0.726
K	1.190	1.390
L	0.559	0.711
L1	0.074	0.226



N-Channel MOSFET

40V 90A 70W DFN5X6

MFT4N90D56

MERITEK

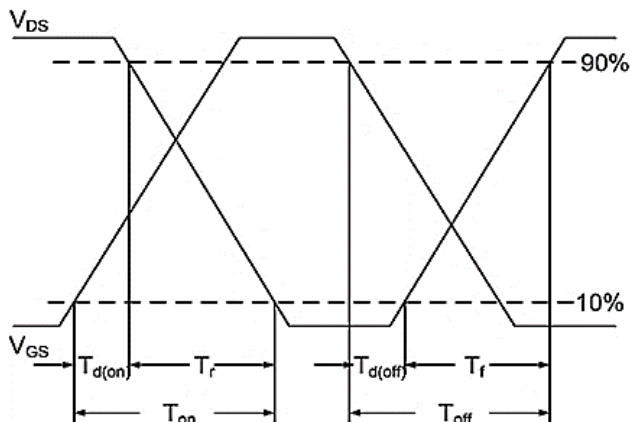
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	40	--	--	V
Drain-Source Leakage Current	$V_{DS}=40V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=55A$	$R_{DS(ON)}$	--	2.4	2.8	m Ω
	$V_{GS}=4.5V, I_D=55A$		--	3.3	3.9	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	1.5	2.2	V
Forward Transconductance	$V_{DS}=5V, I_D=55A$	g_{FS}	--	60	--	S
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_D=55A$	Q_g	--	60	--	nC
Gate-Source Charge		Q_{gs}	--	9.9	--	
Gate-Drain Charge		Q_{gd}	--	9.5	--	
Turn-On Delay Time	$V_{DD}=20V, V_{GS}=10V, R_G=1.6\Omega, I_D=55A$	$T_{d(on)}$	--	10.5	--	ns
Rise Time		T_r	--	4	--	
Turn-Off Delay Time		$T_{d(off)}$	--	35	--	
Fall Time		T_f	--	5	--	
Input Capacitance	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	C_{iss}	--	3510	--	pF
Output Capacitance		C_{oss}	--	860	--	
Reverse Transfer Capacitance		C_{rss}	--	60	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	--	--	90	A
Diode Forward Voltage	$V_{GS}=0V, I_S=55A$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_F=I_S, T_J=25^\circ C, di/dt=100A/\mu s$	T_{rr}	--	24	--	ns
Reverse Recovery Charge		Q_{rr}	--	68	--	nC

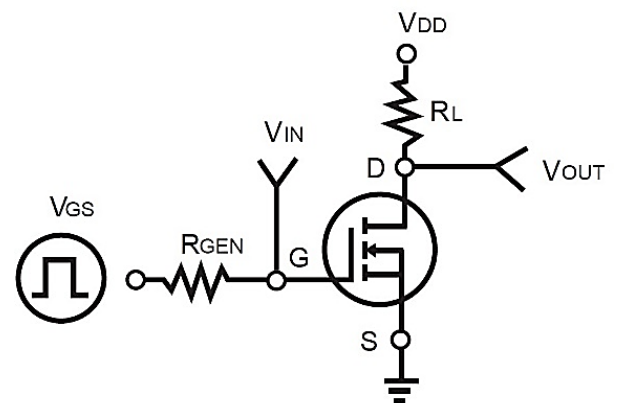
Note:

1. Pulse Test: Pulse Width < 300 μs , Duty Cycle $\leq 2\%$.

Switching Time Waveform

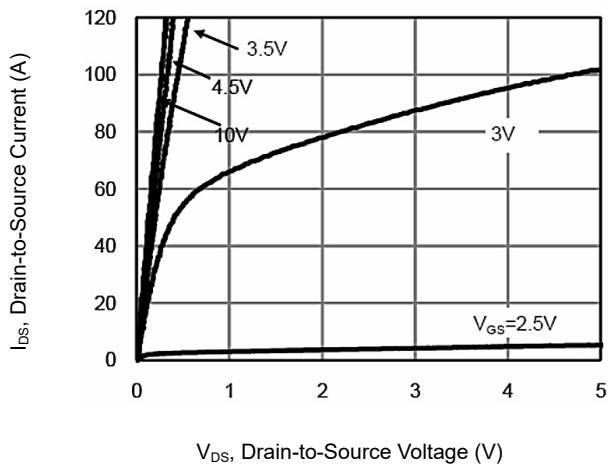


Switching Test Circuit

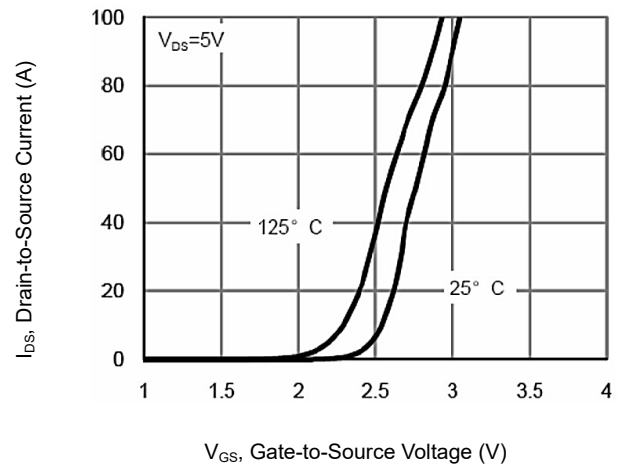


CHARACTERISTIC CURVES

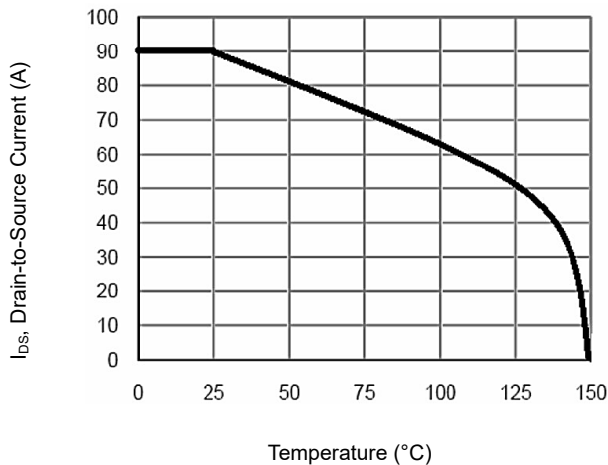
Output Characteristics



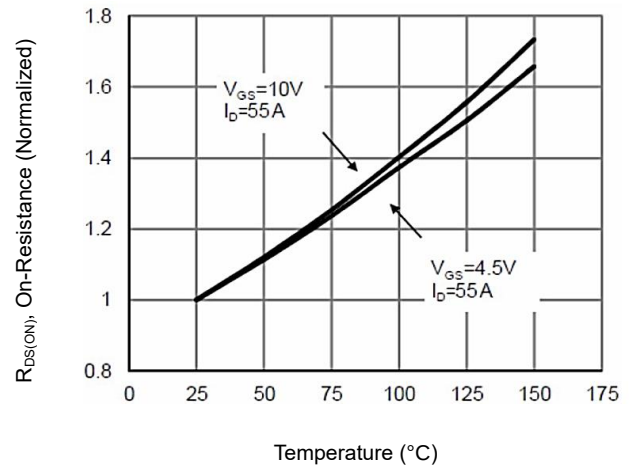
Transfer Characteristics



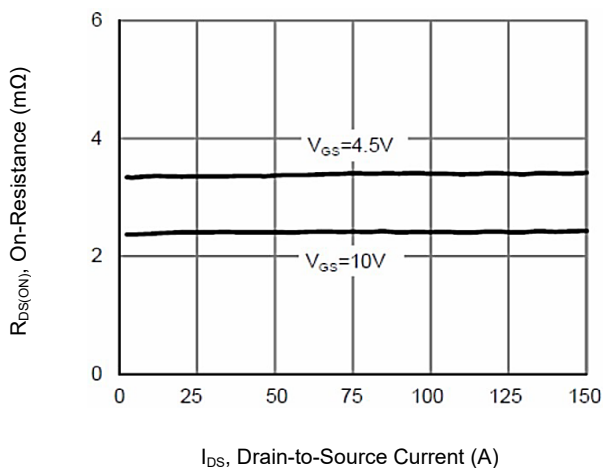
Drain Current Dissipation



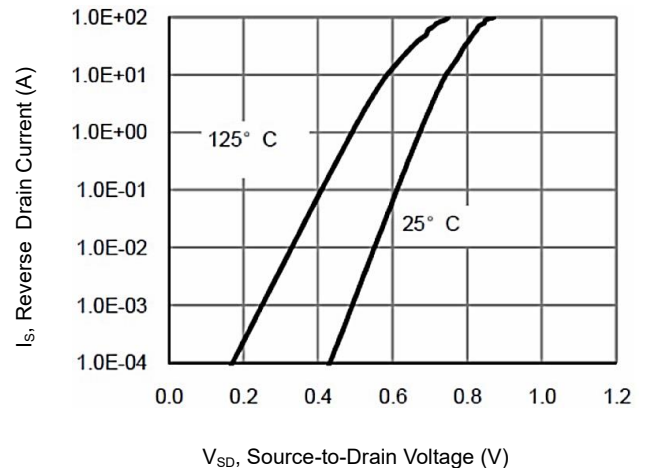
On-Resistance Vs. Junction Temperature



On-Resistance vs Drain Current



Source- Drain Diode Forward



N-Channel MOSFET

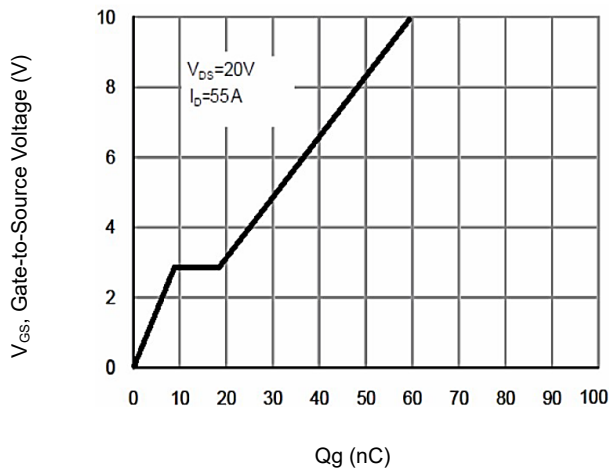
40V 90A 70W DFN5X6

MFT4N90D56

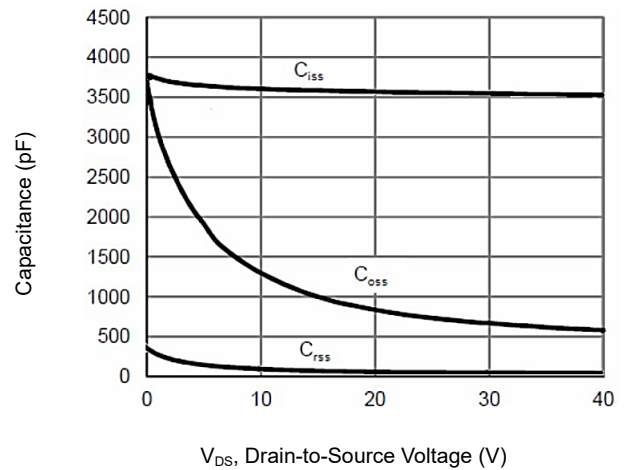
MERITEK

CHARACTERISTIC CURVES

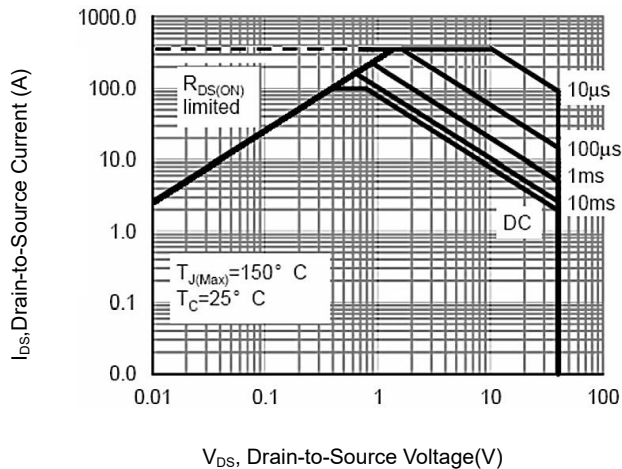
Gate-Charge Characteristics



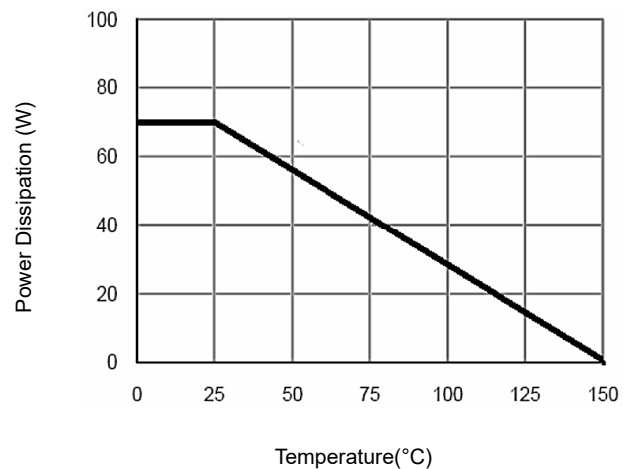
Capacitance



Maximum Safe Operating Area



Power Dissipation



Normalized Transient Thermal Impedance

