

N-Channel MOSFET

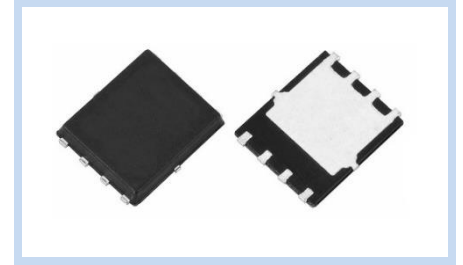
40V 57A DFN5x6-8L

MFT4N57D56

MERITEK

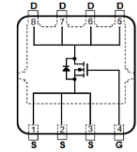
FEATURE

- $R_{DS(ON)} < 5.5m\Omega$, $V_{GS}=10V$, $I_D=10A$
- $R_{DS(ON)} < 6.8m\Omega$, $V_{GS}=4.5V$, $I_D=5A$



MECHANICAL DATA

- Case: Molded Plastic, DFN5x6-8L
- Terminal: Solderable per MIL-STD-750, Method 2026

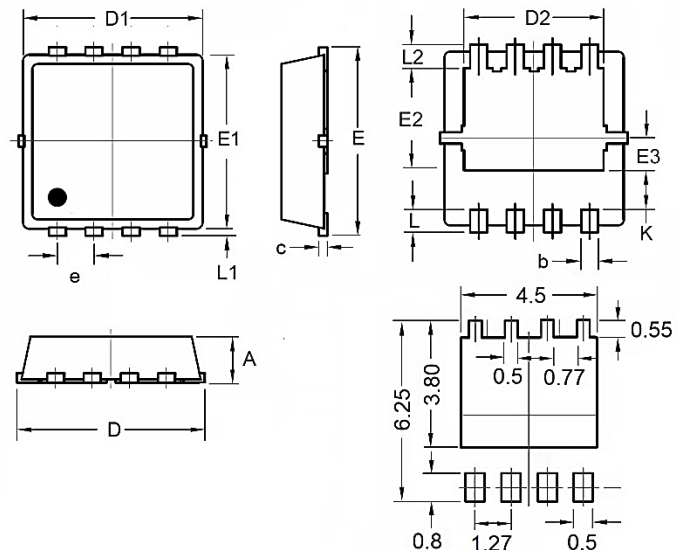


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_C=25^\circ C$	I_D	57	A
	$T_C=100^\circ C$		35	
Drain Current – Pulsed		I_{DM}	300	A
Single Pulse Avalanche Energy		E_{AS}	103	mJ
Single Pulse Avalanche Current		I_{AS}	20.3	A
Power Dissipation	$T_C=25^\circ C$	P_D	35.7	W
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	40	$^\circ C/W$
Thermal Resistance, Junction to Case		$R_{\theta JC}$	4.2	$^\circ C/W$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 ~ 150	$^\circ C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.80	1.17
b	0.34	0.49
c	0.20	0.34
D	4.80	5.20
D1	4.80	5.10
D2	3.80	4.20
E	5.90	6.15
E1	5.65	5.90
E2	3.18	3.78
E3	0.15	0.36
e	1.27	
L	0.38	0.75
L1	0.05	0.25
L2	0.38	0.62



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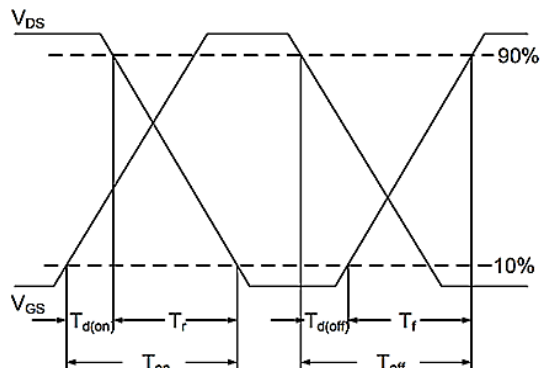
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$I_D=1\text{mA}$	BV_{DSS}	40	--	--	V
Drain-Source Leakage Current	$V_{DS}=32\text{V}, V_{GS}=0\text{V}$	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	$V_{GS}=\pm 16\text{V}, V_{DS}=0\text{V}$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=10\text{A}$	$R_{DS(ON)}$	--	4.4	5.5	$\text{m}\Omega$
	$V_{GS}=4.5\text{V}, I_D=5\text{A}$		--	--	6.8	$\text{m}\Omega$
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	$V_{GS(th)}$	1.0	--	2.5	V
Forward Transconductance	$V_{DS}=5\text{V}, I_D=5\text{A}$	g_{FS}	--	18.8	--	S
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Gate Resistance	$V_{DS}=0\text{V}, V_{GS}=0\text{V}, F=1\text{MHz}$	R_g	--	0.5	--	Ω
Total Gate Charge	$V_{DS}=20\text{V}, V_{GS}=4.5\text{V}, I_D=10\text{A}$	Q_g	--	33	--	nC
			--	69.9	--	
Gate-Source Charge	$V_{DS}=20\text{V}, V_{GS}=10\text{V}, I_D=10\text{A}$	Q_{gs}	--	10	--	nC
Gate-Drain Charge		Q_{gd}	--	13	--	
Turn-On Delay Time		$T_{d(on)}$	--	22	--	
Rise Time	$V_{DS}=20\text{V}, V_{GS}=10\text{V}, R_G=3.3\Omega, I_D=10\text{A}$	T_r	--	26	--	ns
Turn-Off Delay Time		$T_{d(off)}$	--	21	--	
Fall Time		T_f	--	3	--	
Input Capacitance	$V_{DS}=20\text{V}, V_{GS}=0\text{V}, F=1\text{MHz}$	C_{iss}	--	3255	--	pF
Output Capacitance		C_{oss}	--	260	--	
Reverse Transfer Capacitance		C_{rss}	--	195	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Continuous Forward Current	--	I_S	--	--	57	A
Diode Pulse Current	--	I_{SM}	--	--	300	A
Diode Forward Voltage	$V_{GS}=0\text{V}, I_S=1\text{A}$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_S=10\text{A}, di/dt=100\text{A}/\mu\text{s}$	t_{rr}	--	16	--	ns
Reverse Recovery Charge		Q_{rr}	--	9	--	nC

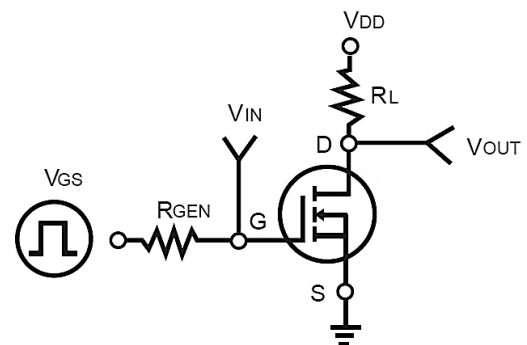
Note:

- The data tested by pulsed, pulse width $\leq 100\mu\text{s}$, Duty Cycles $\leq 2\%$
- Repetitive Rating, Pulse Width Limited by Junction Temperature $T_{J(MAX)}=150^\circ\text{C}$.
- The test conditions: Limited by $T_{J(MAX)}$, $L=0.5\text{mH}$, $I_{AS}=20.3\text{A}$, $V_{GS}=10\text{V}$, $R_G=25\Omega$, starting $T_J=25^\circ\text{C}$
- Device mounted on FR-4 substrate PC board, 2 oz copper, with 1 inch² copper plate in still air.

Switching Time Waveform

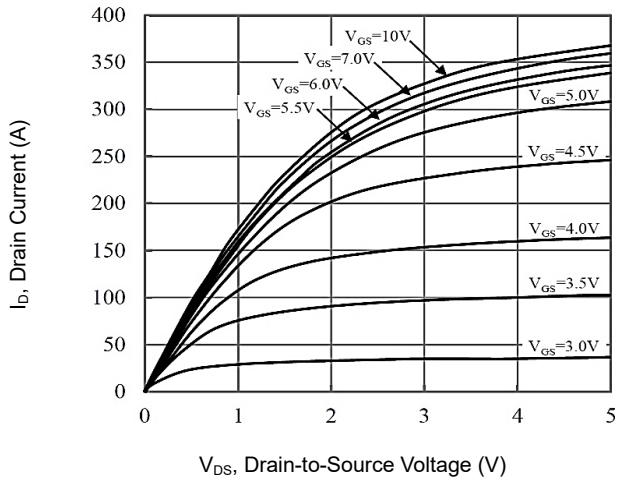


Switching Test Circuit

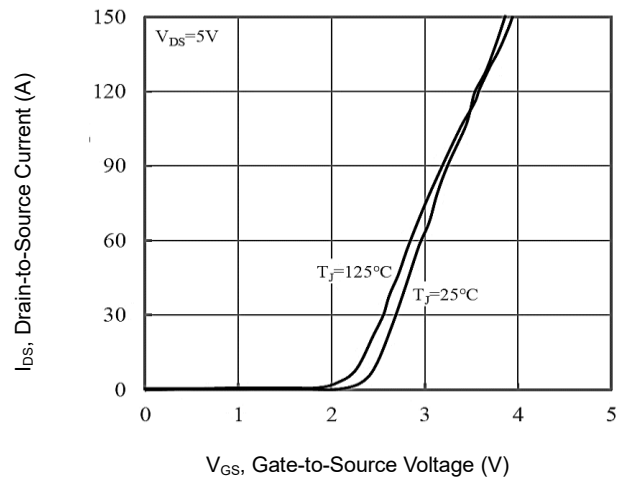


CHARACTERISTICS CURVES

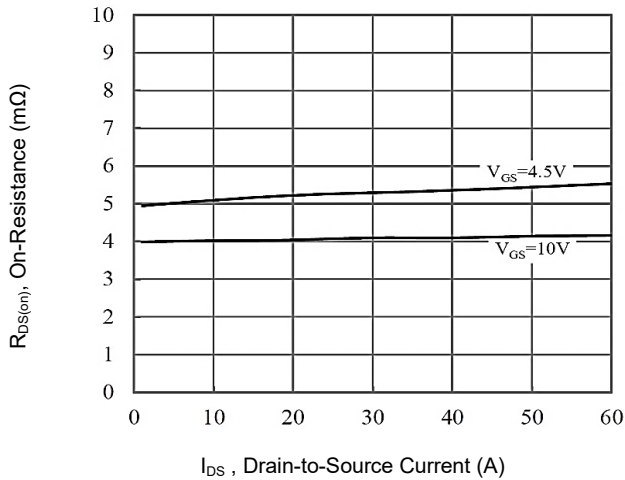
Output Characteristics



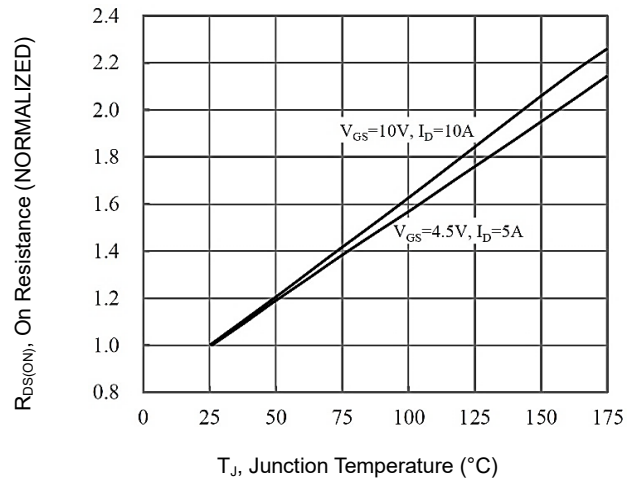
Transfer Characteristics



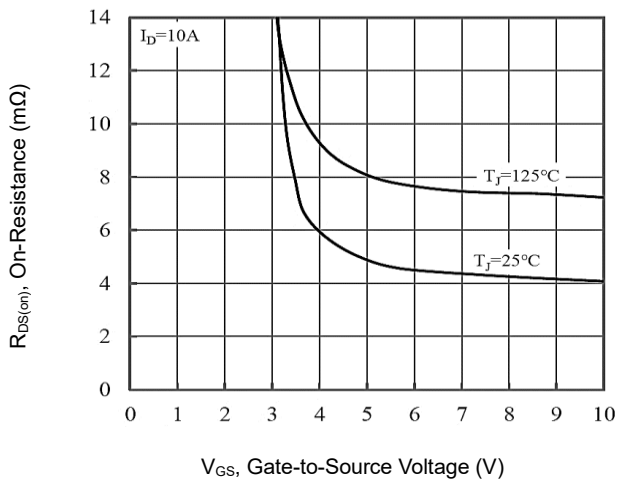
On-Resistance vs Drain Current



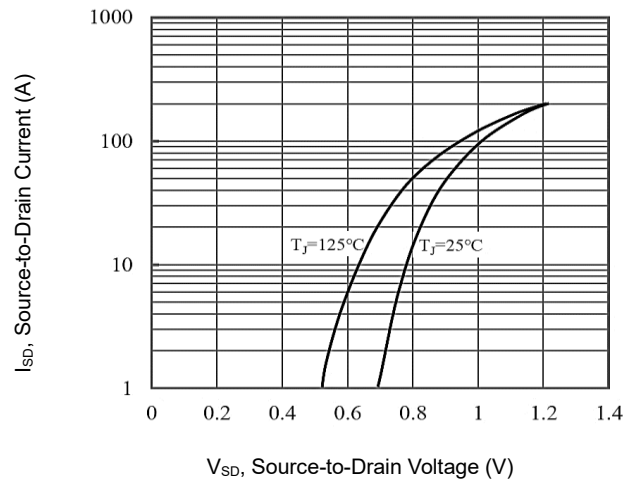
On-Resistance vs Junction Temperature



On-Resistance vs Gate-Source Voltage

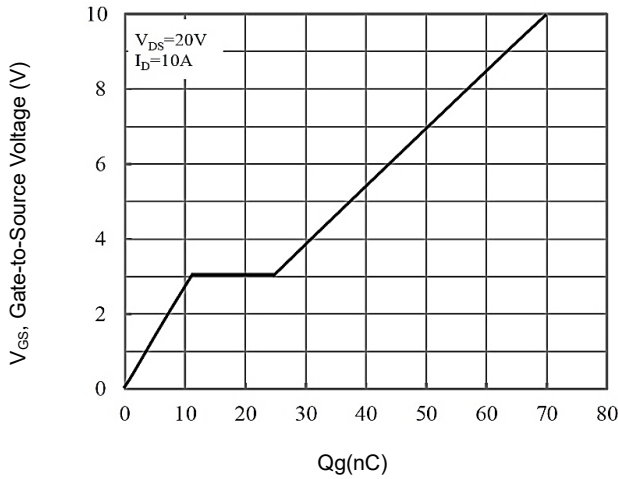


Source-Drain Diode Forward Voltage

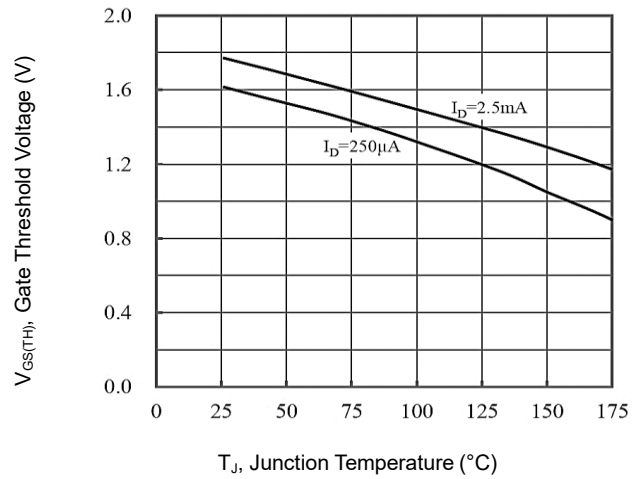


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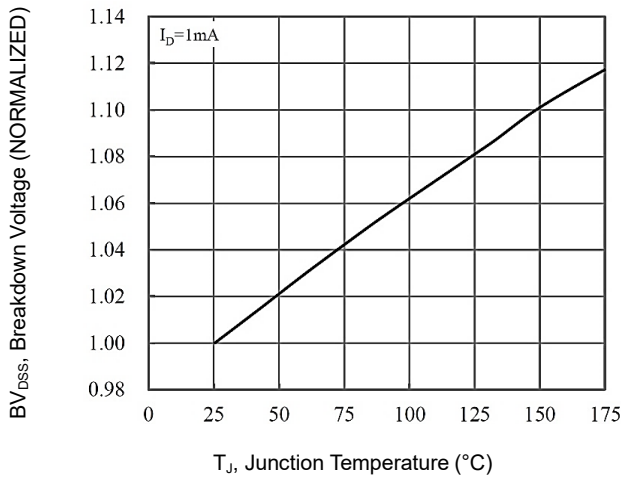
Gate-Charge Characteristics



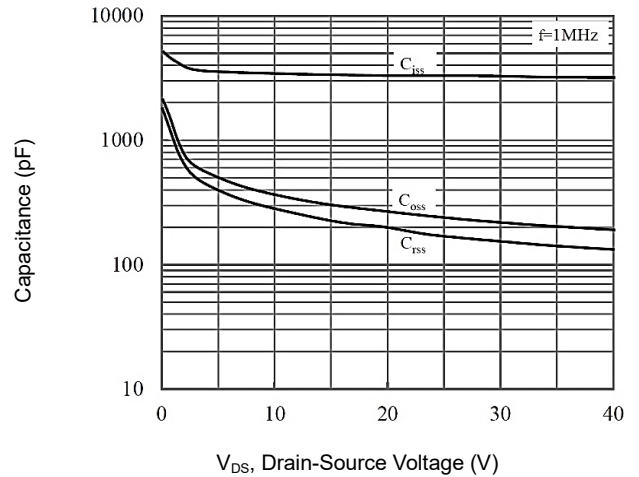
Threshold Voltage vs Junction Temperature



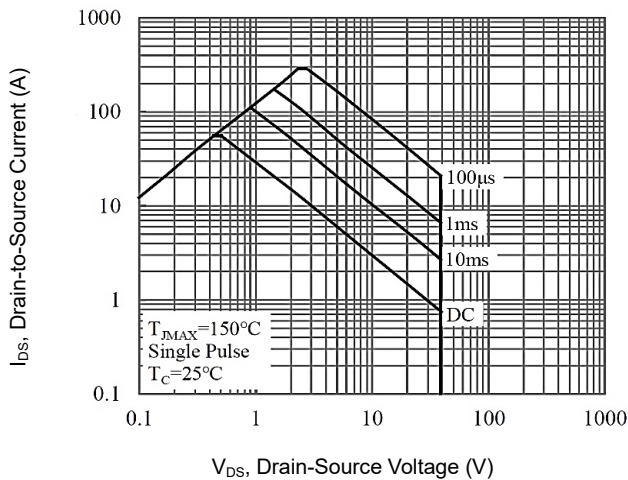
Breakdown Voltage Variation vs Temperature



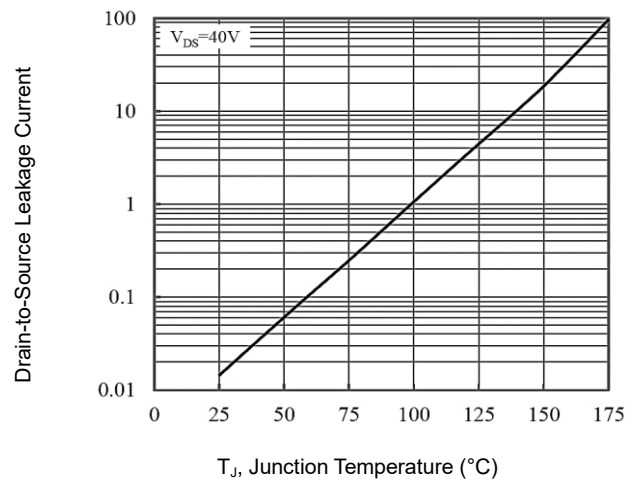
Capacitance vs Drain-Source Voltage



Maximum Safe Operating Area

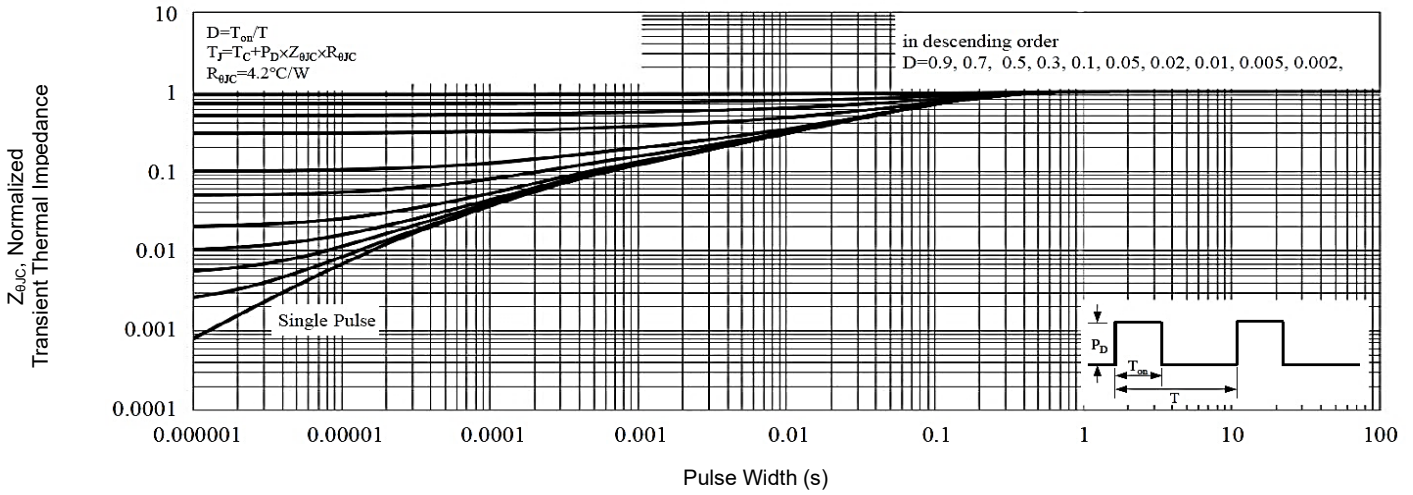


Drain-Source Leakage Current



CHARACTERISTICS CURVES

Maximum Normalized Transient Thermal Impedance Curves



Maximum Normalized Transient Thermal Impedance Curves

