

N Channel MOSFET

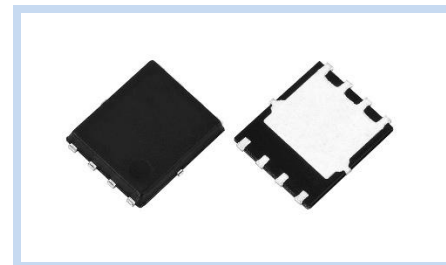
100V 40A DFN5×6-8L AEC-Q101

MFT10N40D56A

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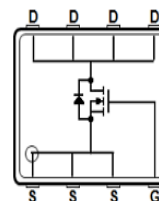
FEATURE

- $R_{DS(ON)} < 21m\Omega$ at $V_{GS}=10V$
- $R_{DS(ON)} < 25m\Omega$ at $V_{GS}=6V$
- Super High Dense Cell Design For Low $R_{DS(ON)}$.
- AEC-Q101 Compliant
- Application: DC/DC Converter, Uninterruptible Power Supply, Power Switching Application



MECHANICAL DATA

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

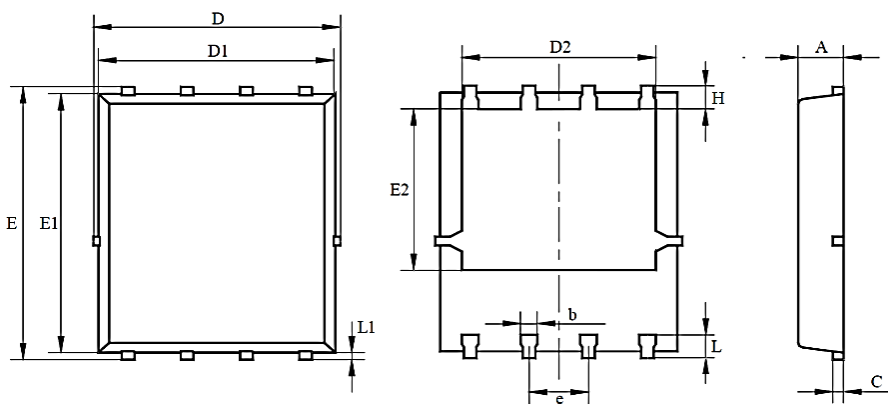


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_C=25^{\circ}C$	I_D	40	A
	$T_C=100^{\circ}C$		25	
Drain Current – Pulsed		I_{DM}	100	A
Power Dissipation	$T_C=25^{\circ}C$	P_D	70	W
Single Pulse Avalanche Energy		E_{AS}	84	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	1.8	$^{\circ}C/W$
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	50	$^{\circ}C/W$
Operating Junction Temperature		T_J	150	$^{\circ}C$
Storage Temperature Range		T_{STG}	-55 to +150	$^{\circ}C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	1.000	1.200
b	0.350	0.450
c	0.254 BSC	
D	5.150	5.550
D1	5.000	5.400
D2	3.920	4.320
E	5.950	6.350
E1	5.660	6.060
E2	3.520	3.920
e	1.27 BSC	
L	0.560	0.760
H	0.50 BSC	



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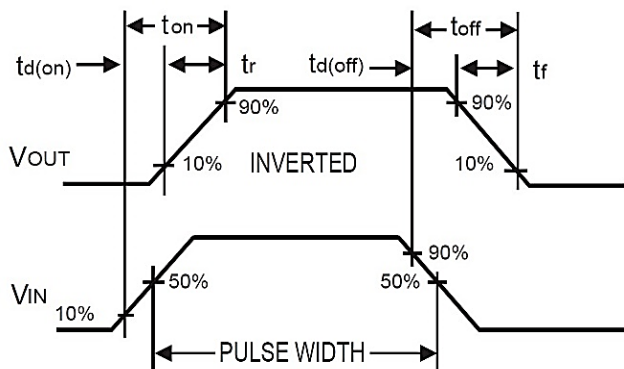
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	100	--	--	V
Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Source 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	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	--	16	21	m Ω
	$V_{GS}=6V, I_D=20A$		--	19	25	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	2.0	--	4.0	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=20A$	Q_g	--	32	--	nC
Gate-Source Charge		Q_{gs}	--	11	--	
Gate-Drain Charge		Q_{gd}	--	5	--	
Turn-On Delay Time	$V_{DS}=50V, V_{GS}=10V, R_G=2.2\Omega, I_D=20A$	$T_{d(on)}$	--	51	--	ns
Rise Time		T_r	--	14	--	
Turn-Off Delay Time		$T_{d(off)}$	--	69	--	
Fall Time		T_f	--	21	--	
Input Capacitance	$V_{DS}=50V, V_{GS}=0V, F=1MHz$	C_{iss}	--	1200	--	pF
Output Capacitance		C_{oss}	--	350	--	
Reverse Transfer Capacitance		C_{rss}	--	11	--	
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	$I_F=20A, di/dt=100A/\mu s, T_J=25^\circ C$	T_{rr}	--	52	--	ns
Reverse Recovery Charge	$T_J=25^\circ C$	Q_{rr}	--	84	--	μC

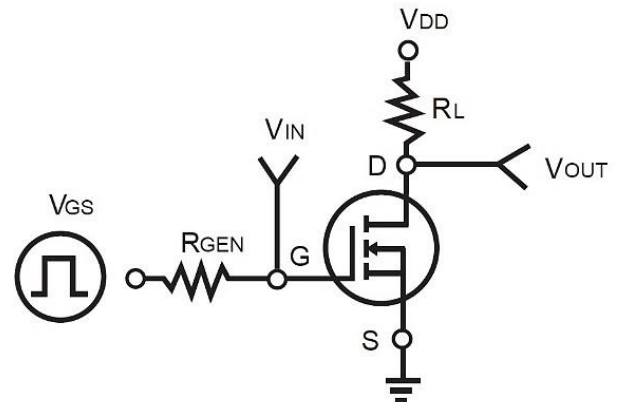
Note:

1. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

Switching Time Waveform



Switching Test Circuit



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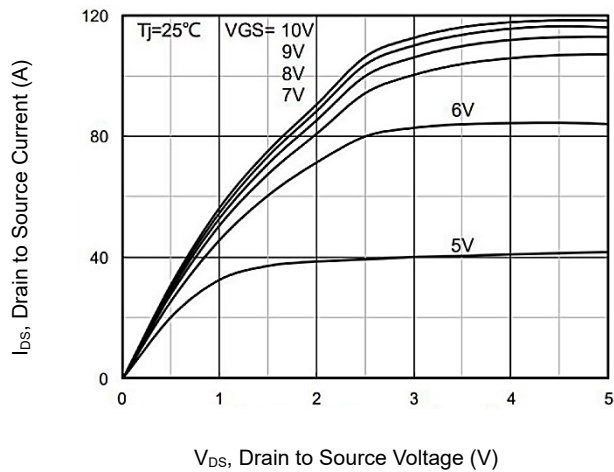
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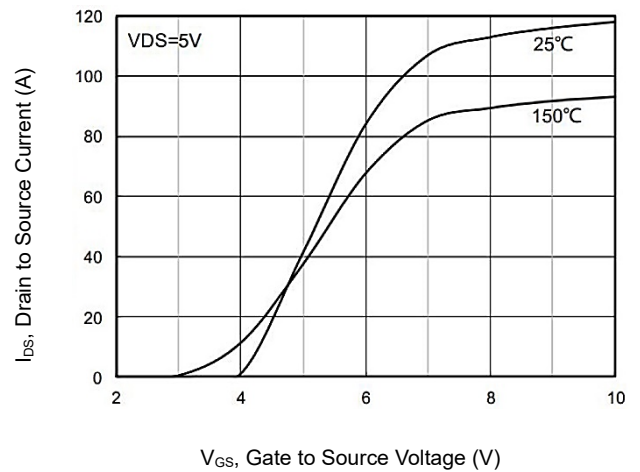
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CHARACTERISTIC CURVES

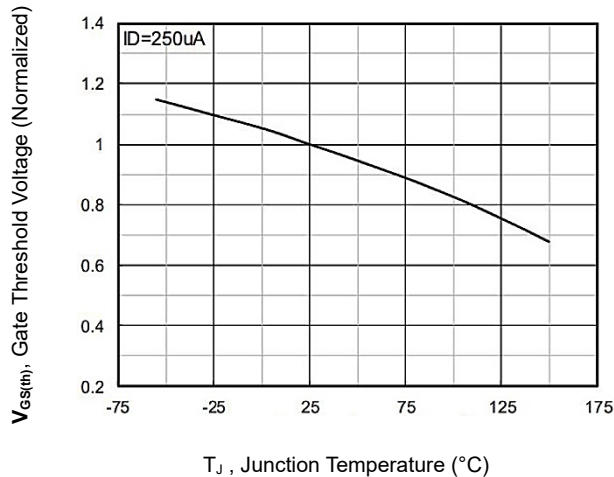
On-Region Characteristics



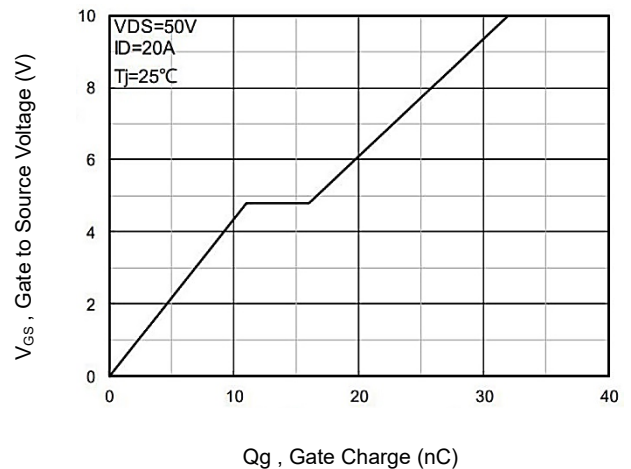
Transfer Characteristics



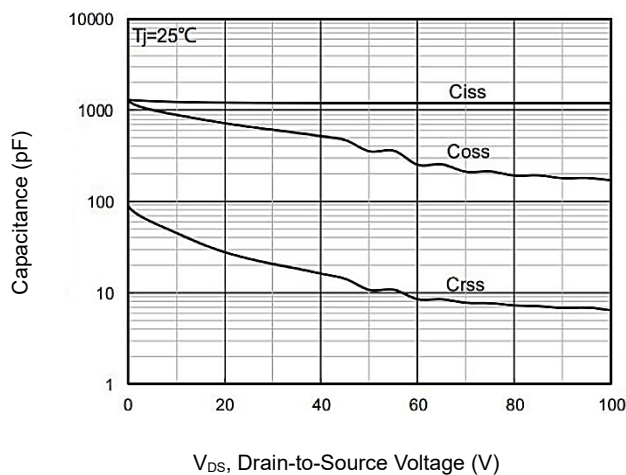
Gate Threshold Voltage vs Temperature



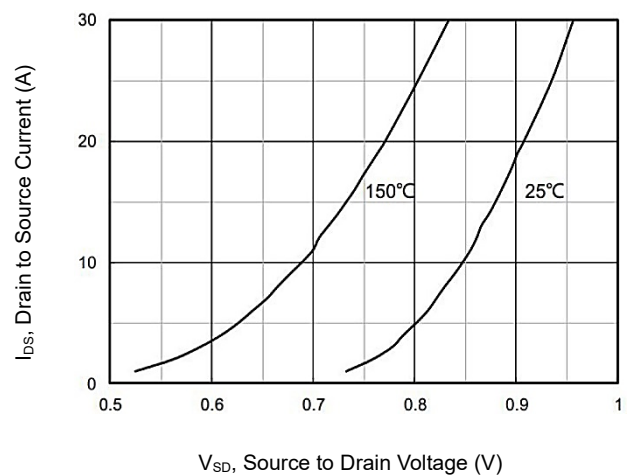
Gate Charge Waveform



Capacitance vs. Drain-Source Voltage



Body Diode Forward Voltage



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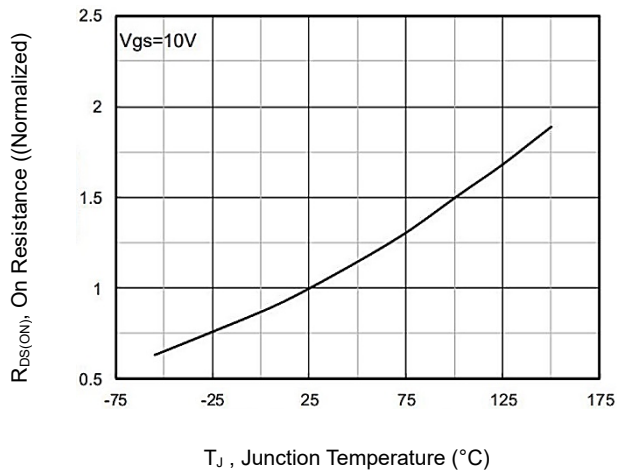
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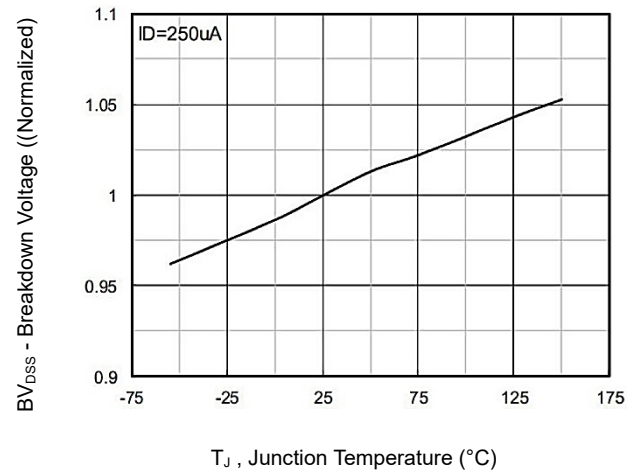
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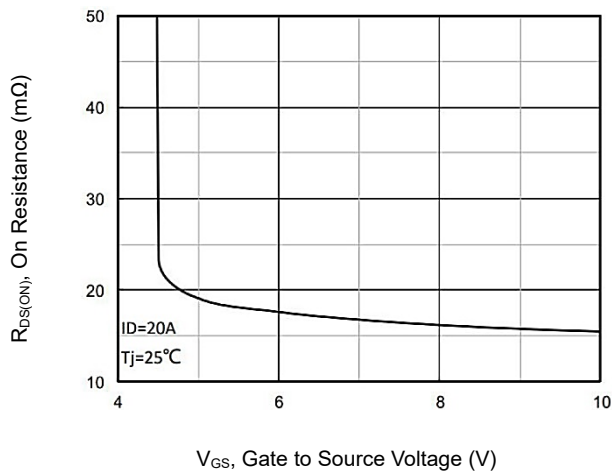
On-Resistance Variation with Temperature



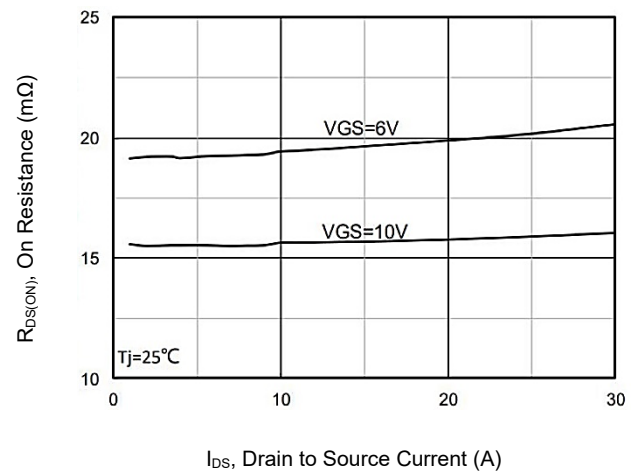
Breakdown Voltage vs Temperature



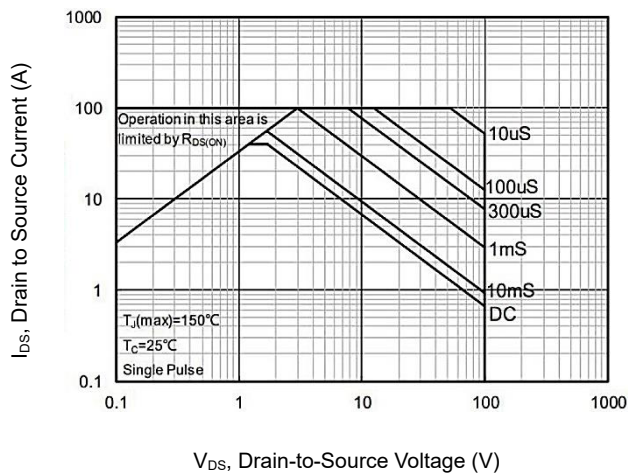
On-Resistance Variation with Gate-Source Voltage



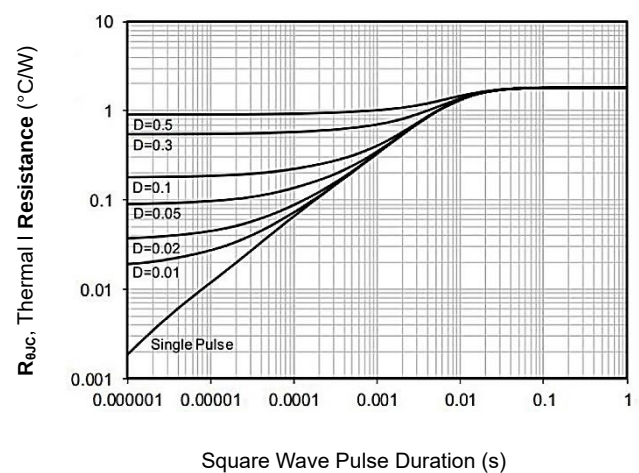
On-Resistance Variation with Drain Current



Maximum Safe Operating Area



Transient Thermal Impedance



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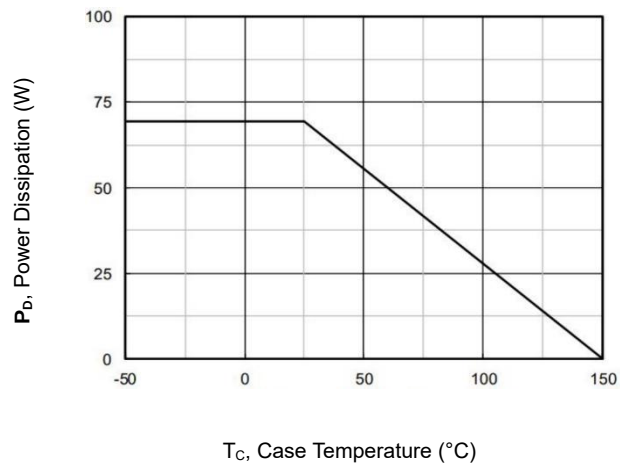
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CHARACTERISTIC CURVES

Power Dissipation



Current Dissipation

