

P-Channel MOSFET

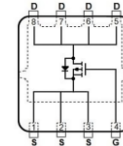
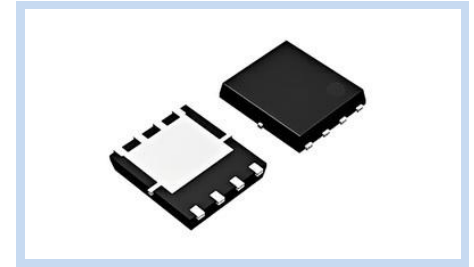
60V 110A 118W DFN5x6-8L

MFT6P110D56

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FEATURE

- $R_{DS(ON)} < 7.4m\Omega$, $V_{GS} = -10V$, $I_D = -30A$
- $R_{DS(ON)} < 10m\Omega$, $V_{GS} = -4.5V$, $I_D = -30A$
- High Density Cell Design for Low RDS(ON)
- Application: DC/DC Converter, Motor Control

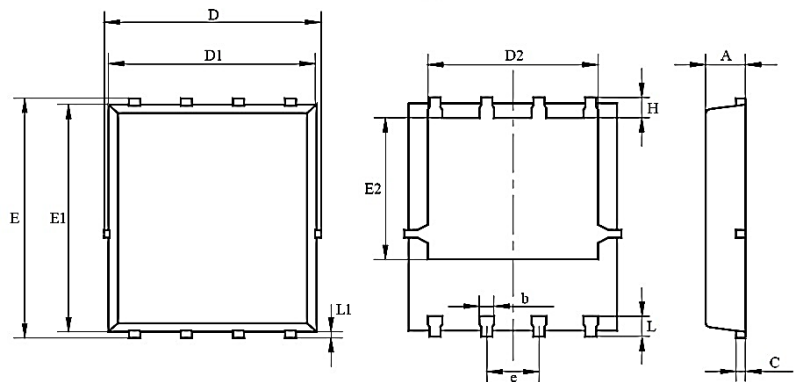


MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current – Continuous	$T_C = 25^\circ C$	I_D	-110	A
	$T_C = 100^\circ C$		-73	
Drain Current – Pulsed		I_{DM}	-440	A
Power Dissipation	$T_C = 25^\circ C$	P_D	118	W
Single Pulse Avalanche Energy		E_{AS}	1092	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	1.06	$^\circ C/W$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to +150	$^\circ C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.900	1.000
b	0.350	0.450
c	0.245 REF	
D	4.944	5.096
D1	4.824	4.976
D2	3.910	4.110
e	1.270 TYP	
E	5.974	6.126
E1	5.674	5.826
E2	3.375	3.575
L	0.559	0.711
L1	0.15 TYP	
H	0.574	0.726



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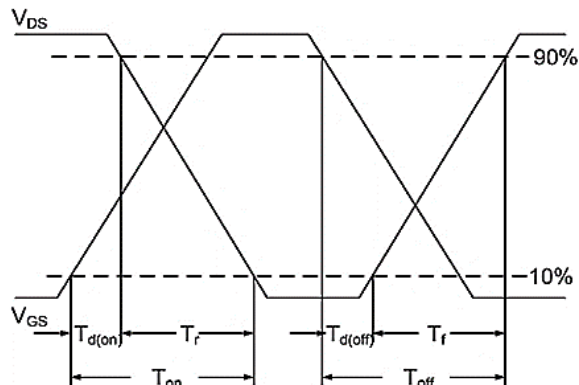
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	BV_{DSS}	-60	--	--	V
Zero Gate Voltage Drain Current	$V_{DS}=-48V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	--	--	-1	μA
Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	I_{GSS}	--	--	± 100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-30A$	$R_{DS(ON)}$	--	5.5	7.4	m Ω
	$V_{GS}=-4.5V, I_D=-30A$		--	7.5	10	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	$V_{GS(th)}$	-1	-2	-3	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=-30V, V_{GS}=-10V, I_D=-40A$	Q_g	--	82	--	nC
Gate-Source Charge		Q_{GS}	--	26	--	
Gate-Drain Charge		Q_{GD}	--	18	--	
Turn-On Delay Time	$V_{DS}=-30V, V_{GS}=-10V, R_G=2.6\Omega, I_D=-40A$	$T_{d(on)}$	--	15	--	nS
Rise Time		T_r	--	52	--	
Turn-Off Delay Time		$T_{d(off)}$	--	135	--	
Fall Time		T_f	--	168	--	
Input Capacitance	$V_{DS}=-30V, V_{GS}=0V, f=1MHz$	C_{iss}	--	6185	--	pF
Output Capacitance		C_{oss}	--	1132	--	
Reverse Transfer Capacitance		C_{rss}	--	81	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	-110	A
Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	V_{SD}	--	--	-1.2	V
Reverse Recovery Time	$I_S=-40A, di/dt=200A/\mu s, T_J=25^\circ C$	t_{rr}	--	65	--	nS
Reverse Recovery Charge		Q_{rr}	--	238	--	nC

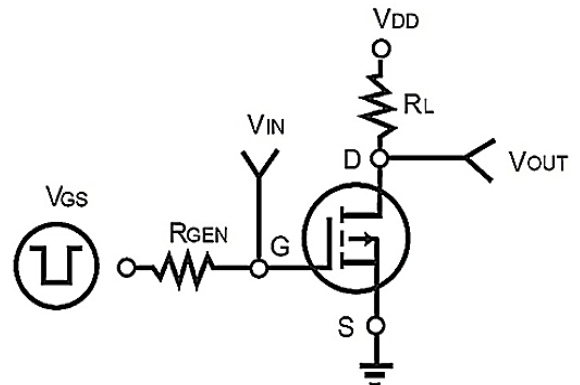
Note:

1. $T_A=25^\circ C$ unless otherwise noted
2. EAS is tested at starting $T_J=25^\circ C, V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25m\Omega$
3. Guaranteed by design, not subject to production testing.

Switching Time Waveform



Switching Test Circuit



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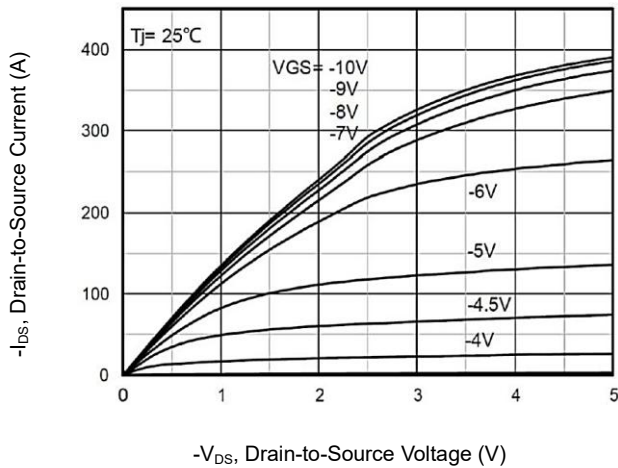
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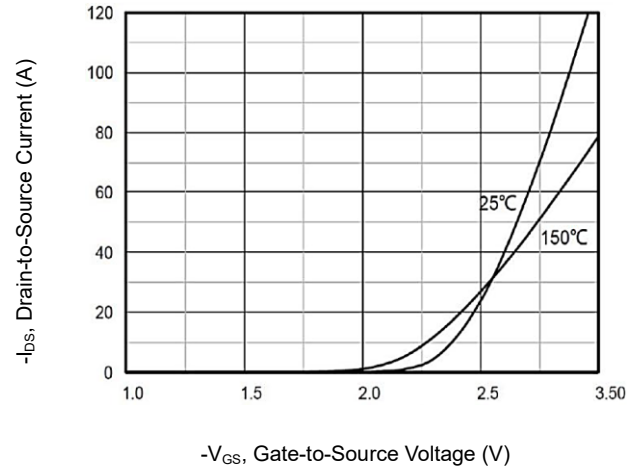
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CHARACTERISTIC CURVES

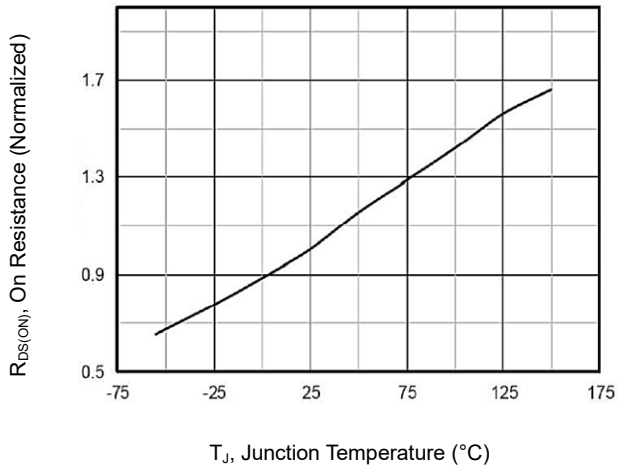
Output Characteristics



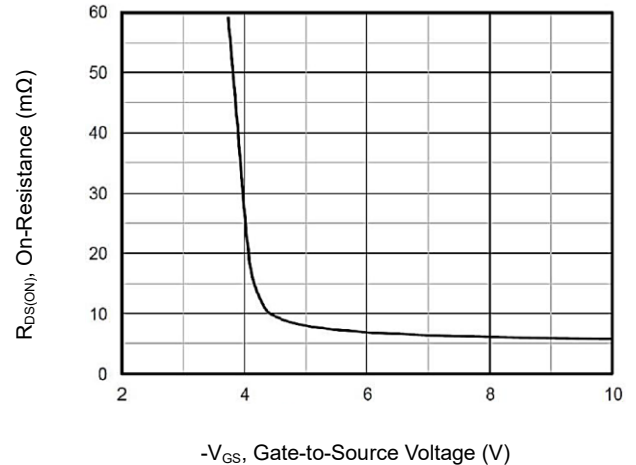
Transfer Characteristics



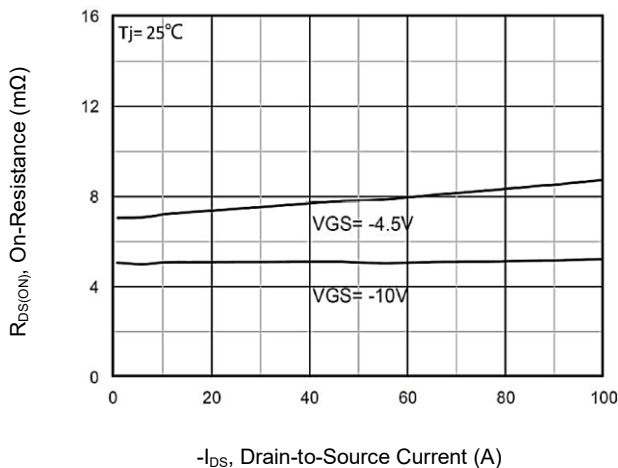
On-Resistance vs. Temperature



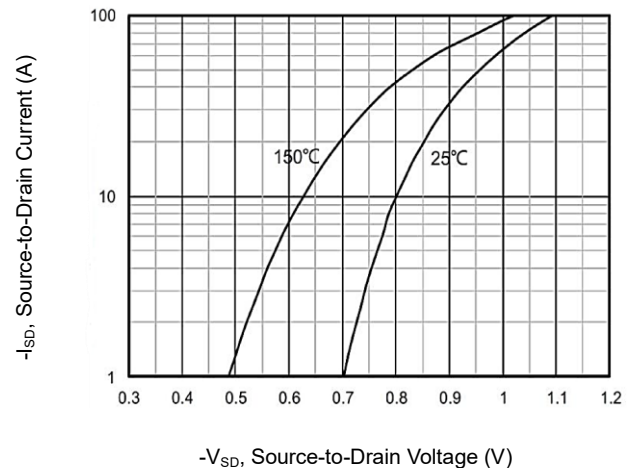
On-Resistance vs. Gate-to-Source Voltage



On-Resistance vs. Drain Current



Body Diode Characteristics



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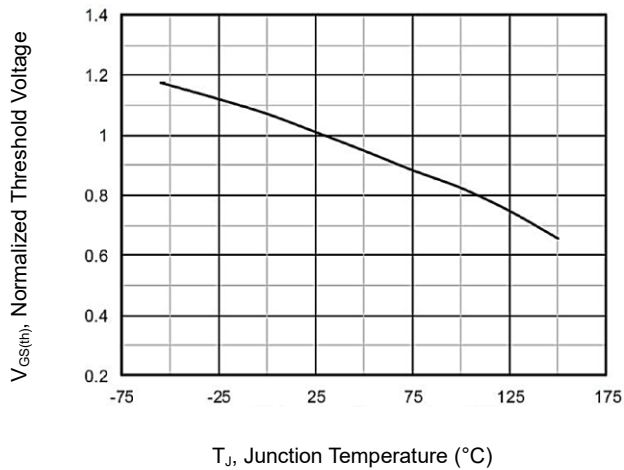
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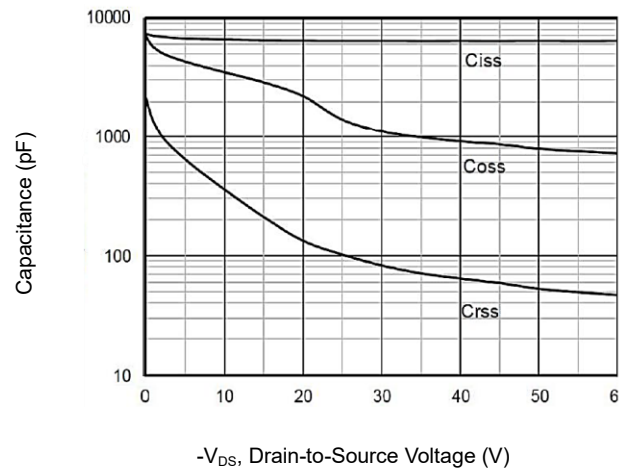
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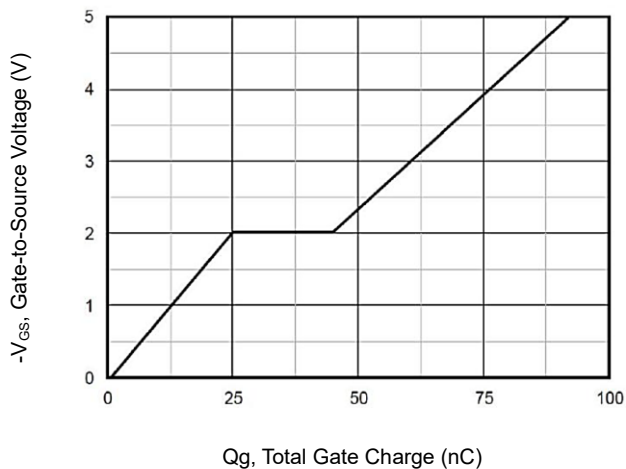
Threshold Voltage vs. Temperature



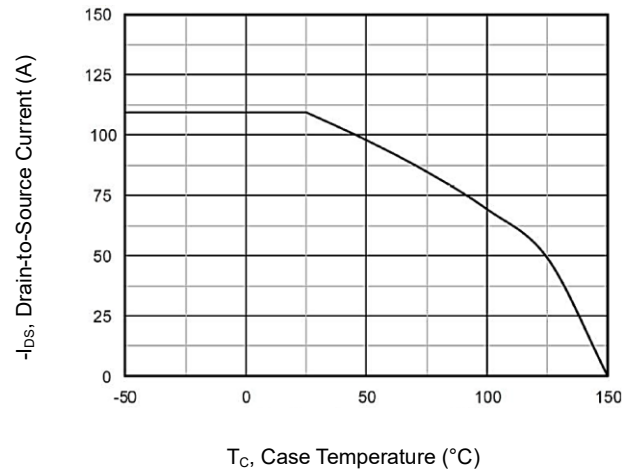
Capacitance



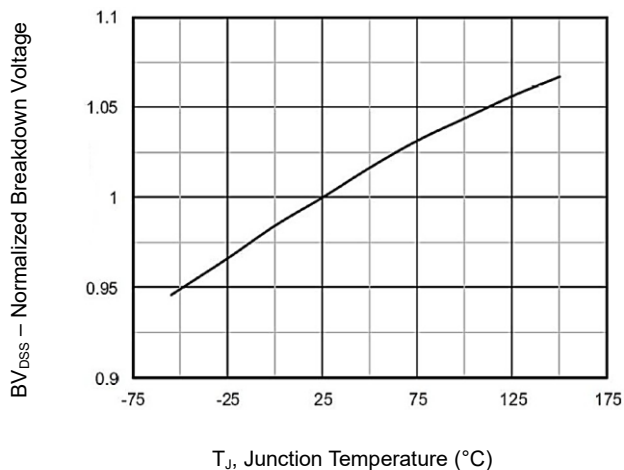
Gate Charge Characteristics



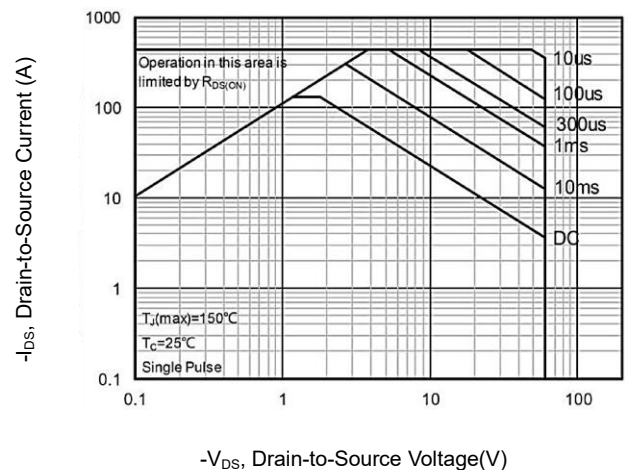
Maximum Drain Current vs. Temperature



Breakdown Voltage vs. Temperature

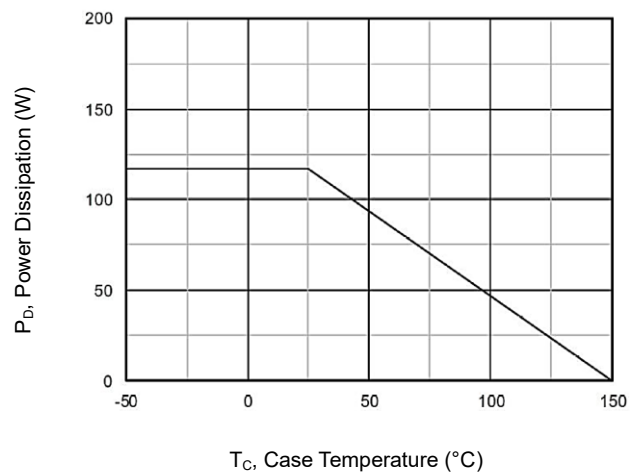


Maximum Safe Operating Area



CHARACTERISTIC CURVES

Power Derating Curve



Maximum Transient Thermal Impedance

