

N-Channel MOSFET

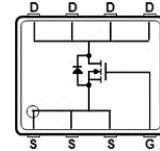
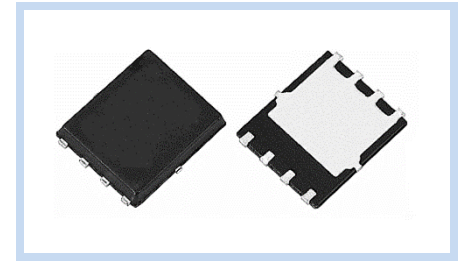
60V 200A 168W DFN5×6-8L

MFT6N200D56

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FEATURE

- $R_{DS(ON)} < 1.3m\Omega$ at $V_{GS}=10V$, $I_D=20A$
- $R_{DS(ON)} < 2m\Omega$ at $V_{GS}=4.5V$, $I_D=10A$
- Super High Dense Cell Design for Low $R_{DS(ON)}$
- Low Gate Charge
- Applications: Battery Protection, UPS

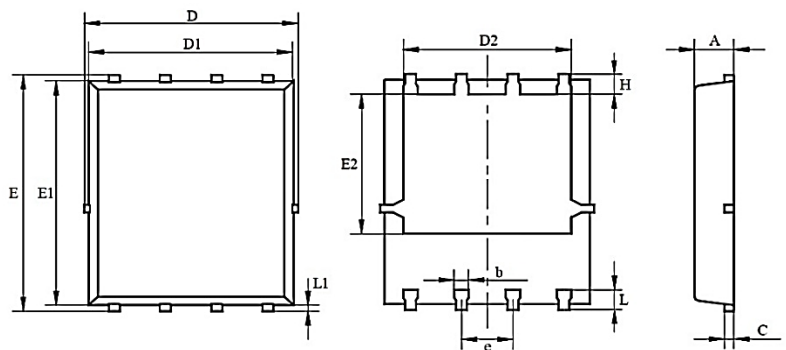


MAXIMUM RATINGS

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	200	A
	$T_C=100^\circ C$		148	
Drain Current – Pulsed		I_{DM}	950	A
Power Dissipation	$T_C=25^\circ C$	P_D	168	W
Single Pulse Avalanche Energy		E_{AS}	885	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	0.89	$^\circ C/W$
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to +175	$^\circ C$

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.900	1.100
b	0.350	0.450
c	0.254 REF	
D	4.944	5.076
D1	4.824	4.976
D2	3.910	4.110
E	5.924	6.076
E1	5.674	5.826
E2	3.375	3.575
e	1.270 BSC	
L	0.534	0.686
H	0.549	0.701



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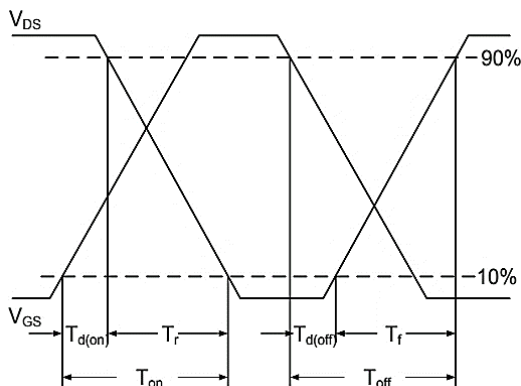
ELECTRICAL CHARACTERISTICS

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	$V_{DS}=60V, V_{GS}=0V$	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	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	--	0.98	1.3	m Ω
	$V_{GS}=4.5V, I_D=10A$		--	1.5	2	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.2	1.8	2.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=30V, V_{GS}=10V, I_D=50A$	Q_g	--	115	--	nC
Gate-Source Charge		Q_{gs}	--	28	--	
Gate-Drain Charge		Q_{gd}	--	16	--	
Turn-On Delay Time	$V_{DS}=30V, V_{GS}=10V, R_{GS}=2.2\Omega, I_D=17A$	$T_{d(on)}$	--	0.6	--	nS
Rise Time		T_r	--	21.8	--	
Turn-Off Delay Time		$T_{d(off)}$	--	67.6	--	
Fall Time		T_f	--	6.6	--	
Input Capacitance	$V_{DS}=30V, V_{GS}=0V, F=1MHz$	C_{iss}	--	7192	--	pF
Output Capacitance		C_{oss}	--	1647	--	
Reverse Transfer Capacitance		C_{rss}	--	44	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	200	A
Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_F=1A, di/dt=100A/\mu s$	T_{rr}	--	98	--	nS
Reverse Recovery Charge		Q_{rr}	--	310	--	nC

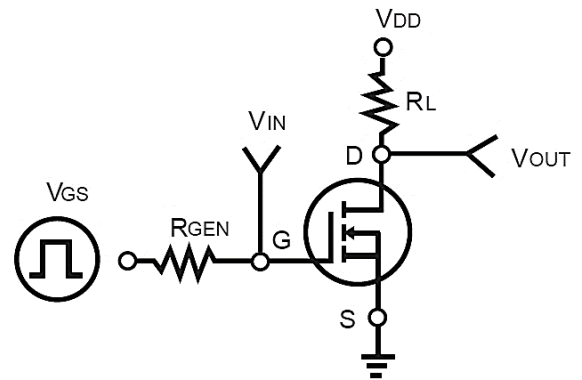
Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. EAS condition: $T_J=25^\circ C, V_{DD}=48V, V_G=10V, R_G=25\Omega, L=0.1mH, I_{AS}=80A$.
3. The power dissipation P_D is limited by $175^\circ C$ junction temperature.
4. Guaranteed by design, not subject to production.

Switching Time Waveform



Switching Test Circuit



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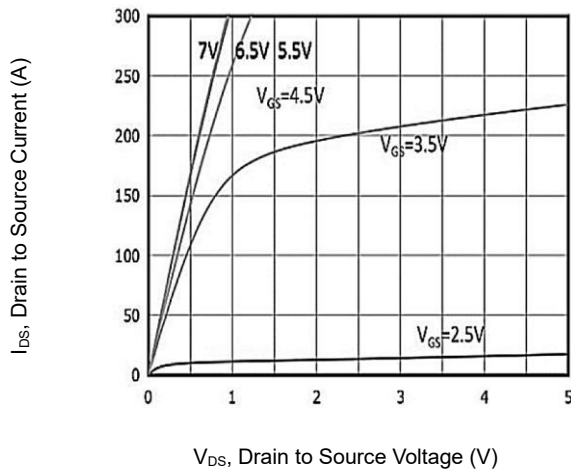
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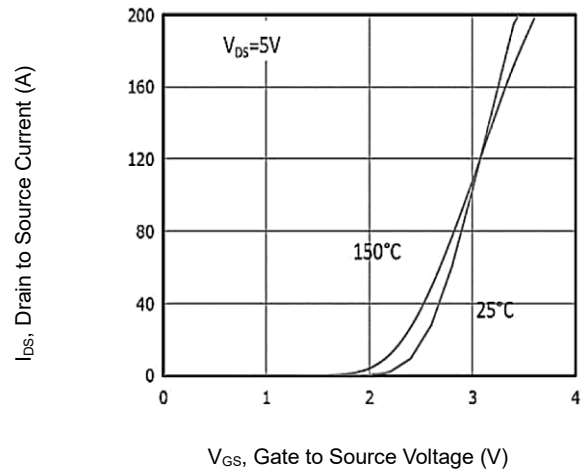
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CHARACTERISTIC CURVES

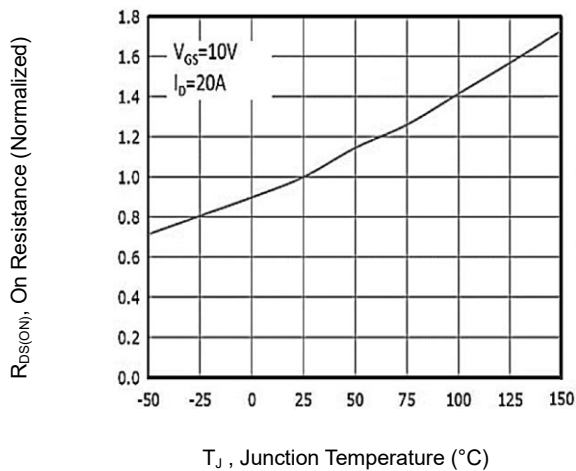
Output Characteristics



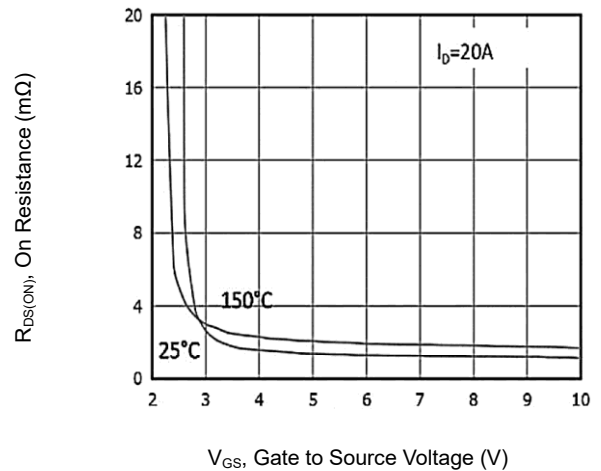
Transfer Characteristics



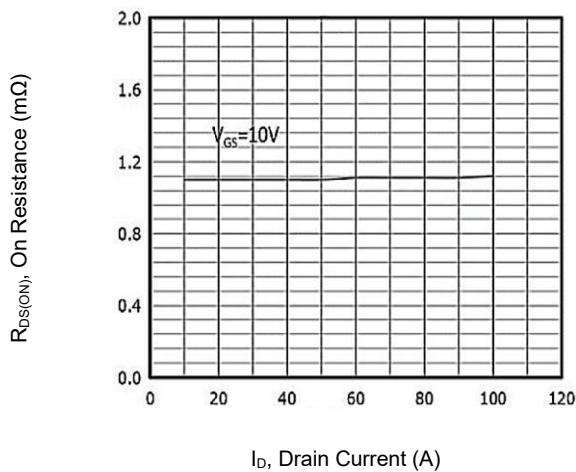
On-Resistance vs. Temperature



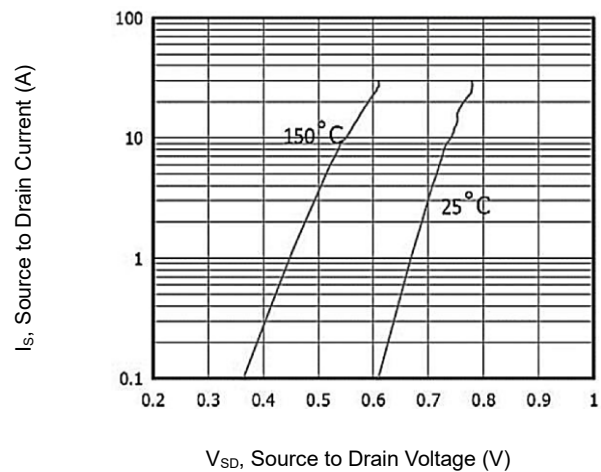
On-Resistance vs. Gate-Source Voltage



On-Resistance vs. Drain Current



Body Diode Characteristics



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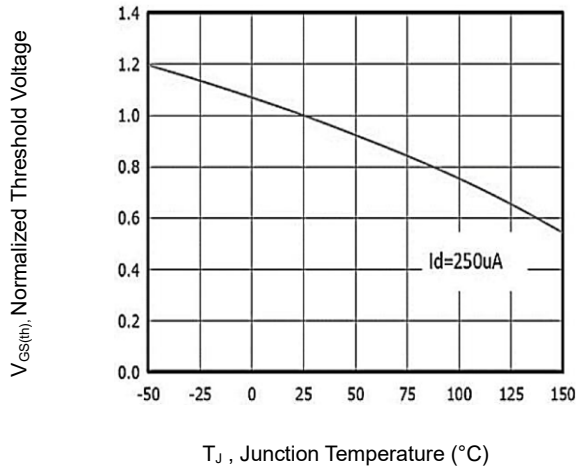
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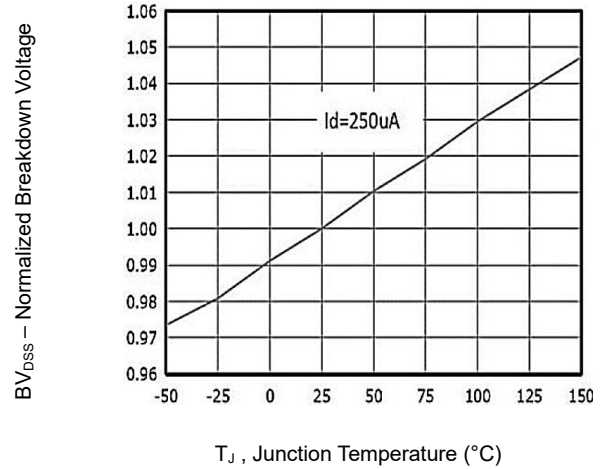
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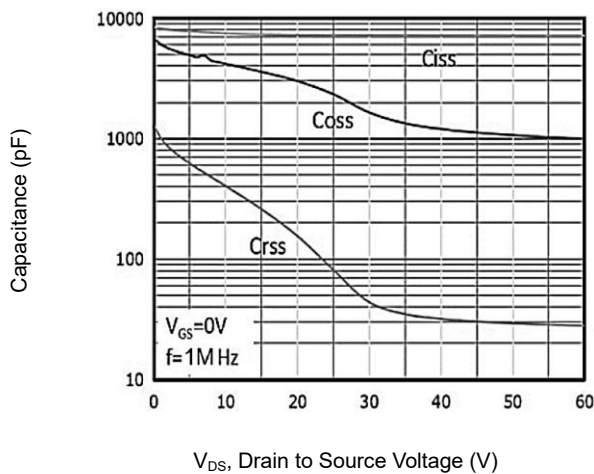
Threshold Voltage vs. Temperature



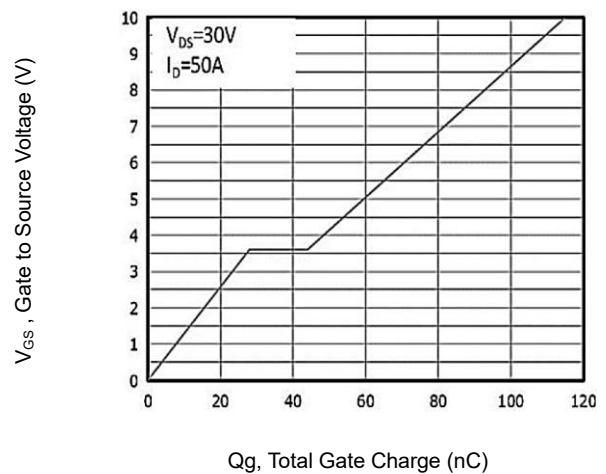
Breakdown Voltage vs. Temperature



Capacitance



Gate Charge Characteristics



Normalized Maximum Transient Thermal Response Curves

