

N-Channel MOSFET

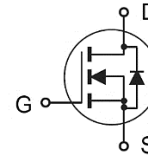
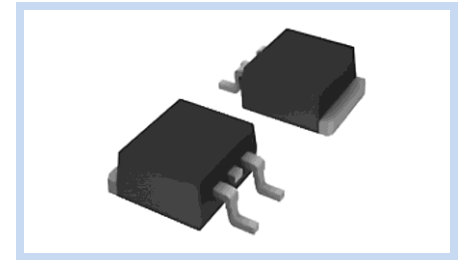
40V 280A 230W TO-263

MFT4N280T263

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FEATURE

- $R_{DS(ON)} < 1.5m\Omega$ at $V_{GS}=10V$, $I_D=30A$
- $R_{DS(ON)} < 2.5m\Omega$ at $V_{GS}=4.5V$, $I_D=20A$
- Super High Dense Cell Design for Low $R_{DS(ON)}$
- Low Gate Charge
- Applications: Battery Protection, UPS, BLDC



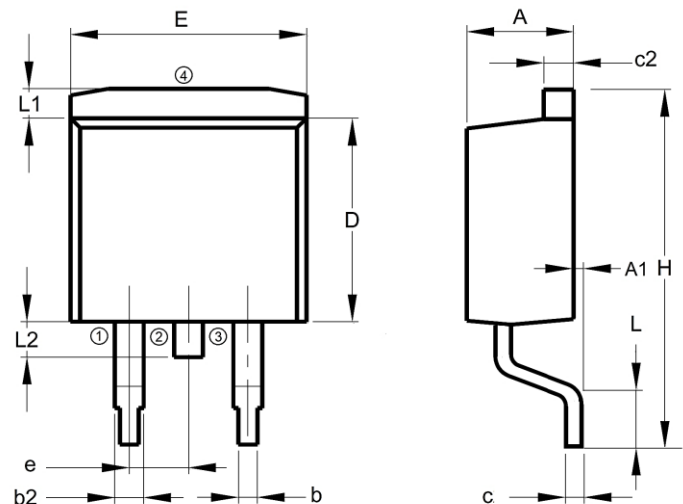
MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous	I_D	$V_{GS}=10V, T_C=25^\circ C$	A
		$V_{GS}=10V, T_C=100^\circ C$	
Drain Current – Pulsed	I_{DM}	1120	A
Power Dissipation	P_D	230	W
Single Pulse Avalanche Energy	E_{AS}	818	mJ
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.54	$^\circ C/W$
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 to +150	$^\circ C$

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.35	4.60
A1	0.09	0.11
b	0.70	1.00
b2	1.25	1.50
c	0.45	0.65
c2	1.29	1.40
D	9.10	9.30
E	9.85	10.20
e	2.54 BSC	
H	15.30	15.70
L	2.34	2.74
L1	1.00	1.20
L2	1.30	1.50

Note: 1: Gate, 2,4: Drain, 3: Source



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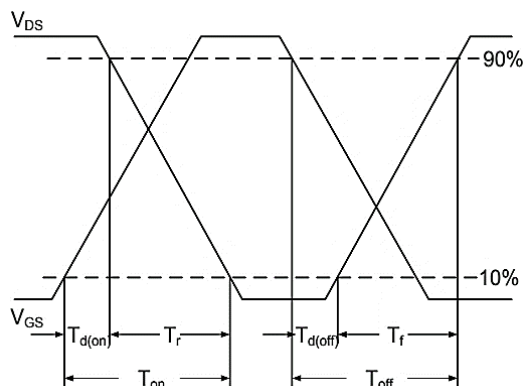
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	40	--	--	V
Zero Gate Voltage Drain 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	$V_{GS}=10V, I_D=30A$	$R_{DS(ON)}$	--	1.2	1.5	m Ω
	$V_{GS}=4.5V, I_D=20A$		--	1.7	2.5	
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	1.0	1.8	2.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=20V, V_{GS}=10V, I_D=85A$	Q_g	--	127	--	nC
Gate-Source Charge		Q_{gs}	--	35	--	
Gate-Drain Charge		Q_{gd}	--	26	--	
Turn-On Delay Time	$V_{DS}=20V, V_{GS}=10V, R_{GS}=1.6\Omega, I_D=85A$	$T_{d(on)}$	--	22.5	--	nS
Rise Time		T_r	--	6.7	--	
Turn-Off Delay Time		$T_{d(off)}$	--	80.3	--	
Fall Time		T_f	--	26.9	--	
Input Capacitance	$V_{DS}=20V, V_{GS}=0V, F=1MHz$	C_{iss}	--	8300	--	pF
Output Capacitance		C_{oss}	--	1510	--	
Reverse Transfer Capacitance		C_{rss}	--	130	--	
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Diode Forward Current	--	I_S	--	--	280	A
Diode Forward Voltage	$V_{GS}=0V, I_S=30A$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_F=I_S, di/dt=100A/\mu s$	T_{rr}	--	100	--	nS
Reverse Recovery Charge		Q_{rr}	--	163	--	nC

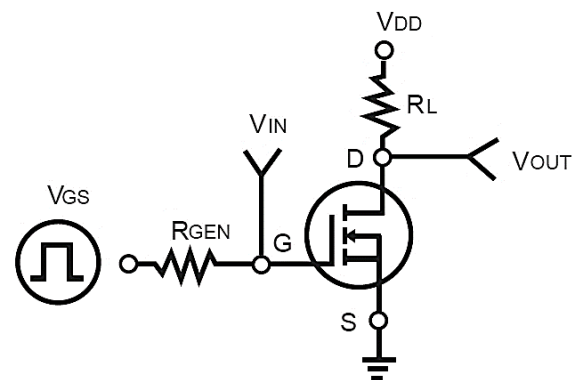
Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
3. The EAS data shows maximum rating. EAS condition: $V_{DD}=32V, V_{GS}=10V, L=0.1mH, I_{AS}=70A$.
4. The power dissipation P_D is limited by 150°C junction temperature.
5. Guaranteed by design, not subject to production testing.

Switching Time Waveform



Switching Test Circuit



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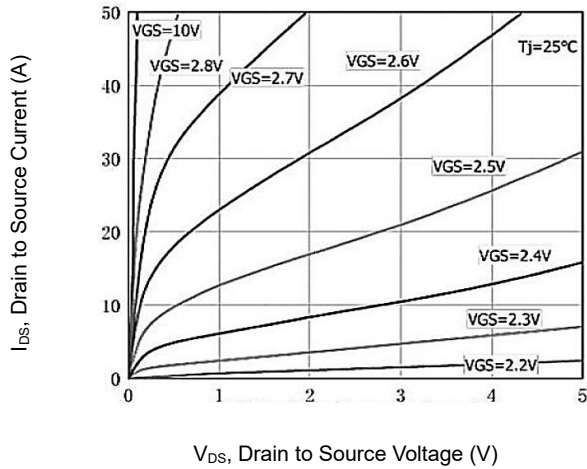
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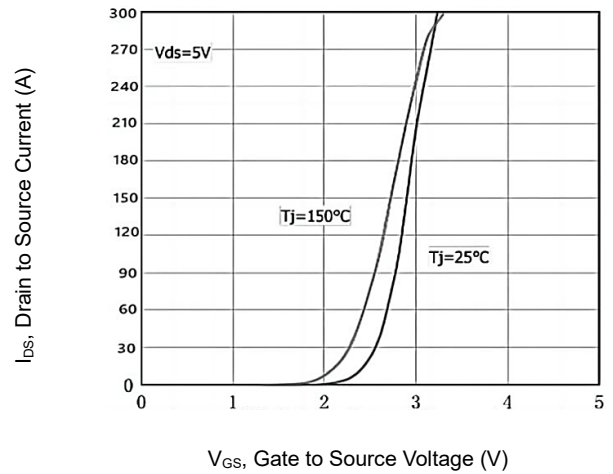
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CHARACTERISTIC CURVES

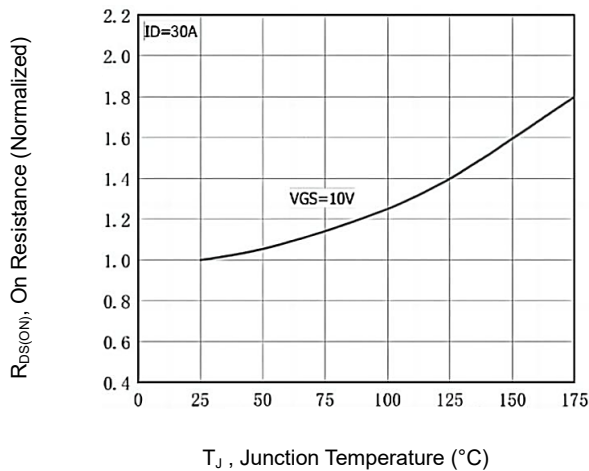
Output Characteristics



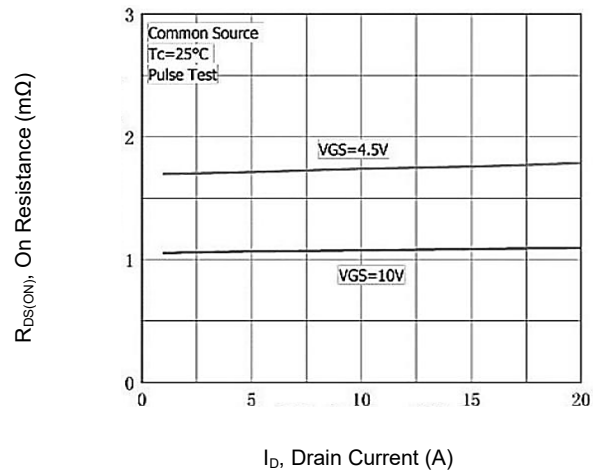
Transfer Characteristics



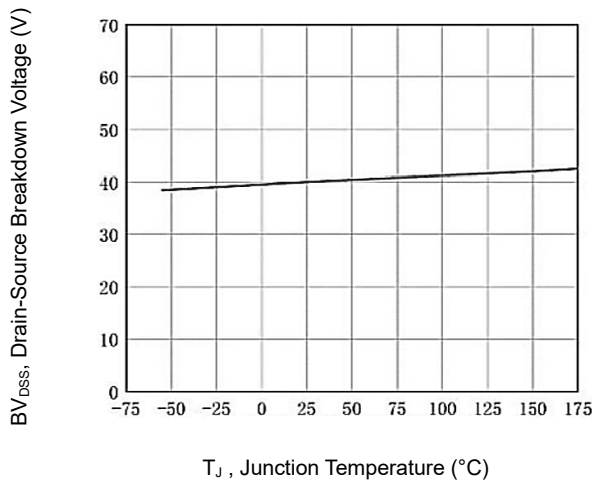
On-Resistance vs. Temperature



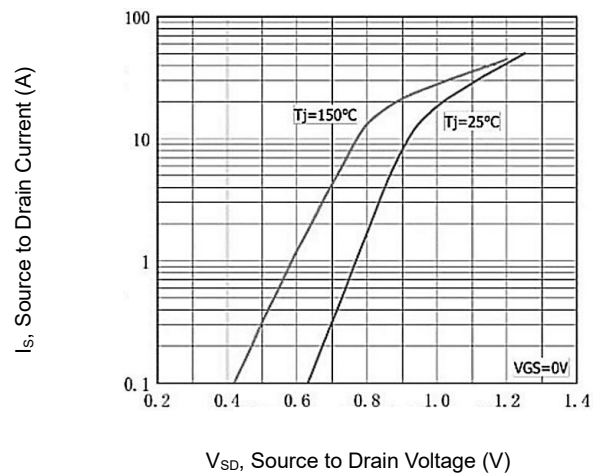
On-Resistance vs. Drain Current



Breakdown Voltage vs. Temperature



Body Diode Characteristics



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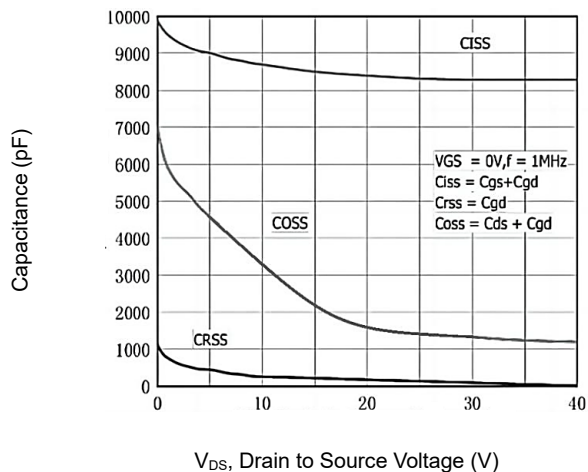
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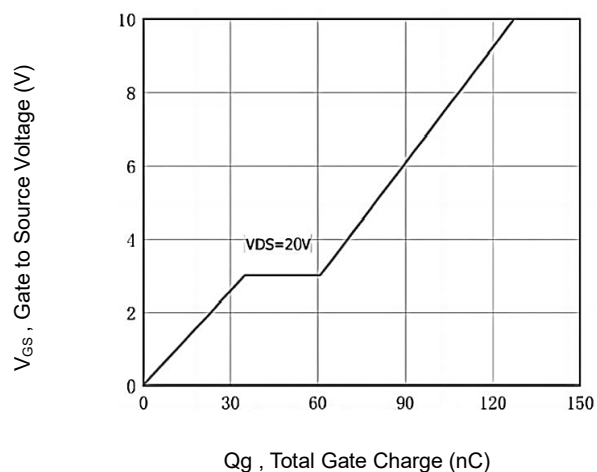
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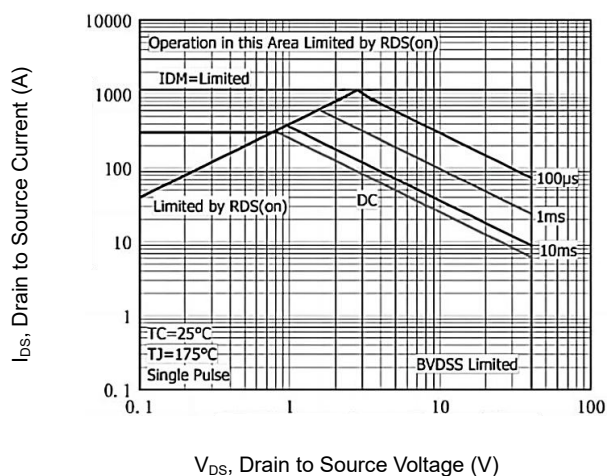
Capacitance



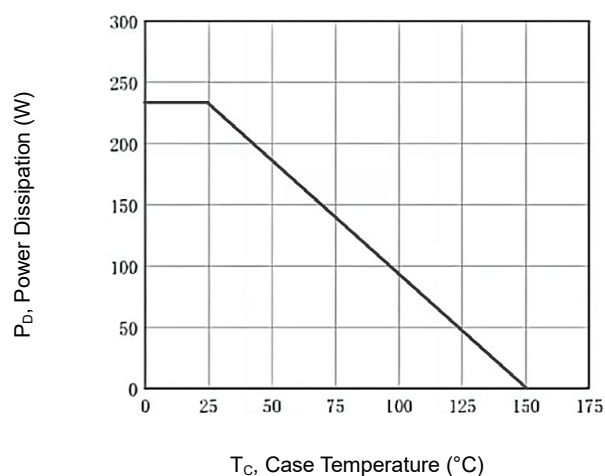
Gate Charge Characteristics



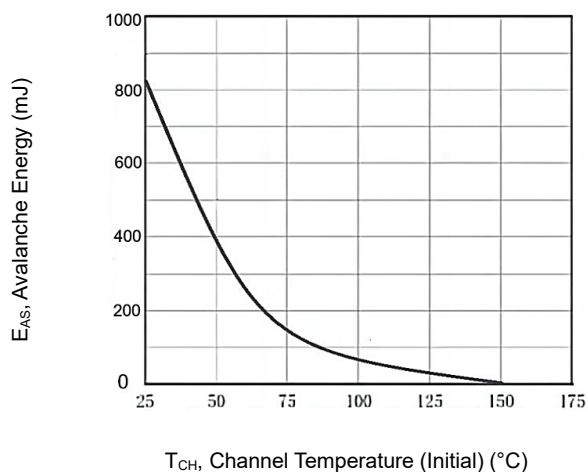
Maximum Safe Operating Area



Maximum Power Dissipation vs Temperature



Maximum EAS vs. Channel Temperature



Maximum Transient Thermal Response Curves

