

N-Channel MOSFET

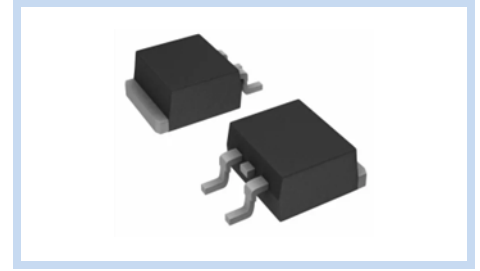
650V 46.7A 305W TO-263

MFT65N46T263

MERITEK

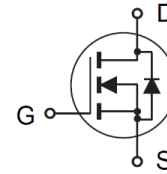
FEATURE

- $R_{DS(ON)} < 56m\Omega$, $V_{GS}=10V$, $I_D=46.7A$
- High Power and Current Handling Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$



MECHANICAL DATA

- Case: TO-263 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

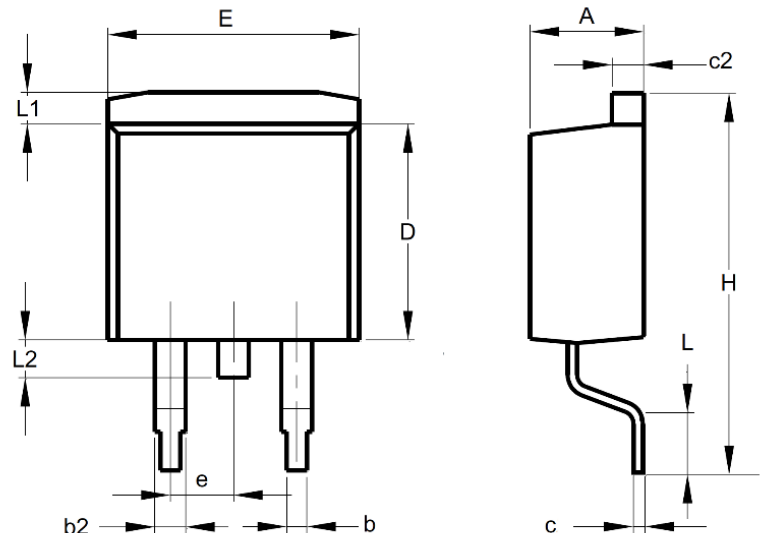


MAXIMUM RATINGS

Parameter	Symbol	Value	Unit	
Drain-Source Voltage	V_{DS}	650	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Drain Current – Continuous	I_D	$T_C=25^\circ C$	46.7	A
		$T_C=100^\circ C$	29.5	A
Drain Current – Pulsed	I_{DM}	187	A	
Power Dissipation	P_D	$T_C=25^\circ C$	305	W
		Derate above $25^\circ C$	2.44	W/ $^\circ C$
Single Pulsed Avalanche Energy	E_{AS}	469	mJ	
Single Pulsed Avalanche Current	I_{AS}	5	A	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ C/W$	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.41	$^\circ C/W$	
Operating Junction and Storage Temperature	T_J, T_{STG}	-55 to 150	$^\circ C$	

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.29	4.70
b	0.69	0.94
b2	1.22	1.40
c	0.36	0.56
c2	1.22	1.40
D	8.64	9.65
E	9.70	10.54
e	2.29	2.79
L	2.24	2.84
L1	1.40	
L2	0.96	1.78
H	14.61	15.88



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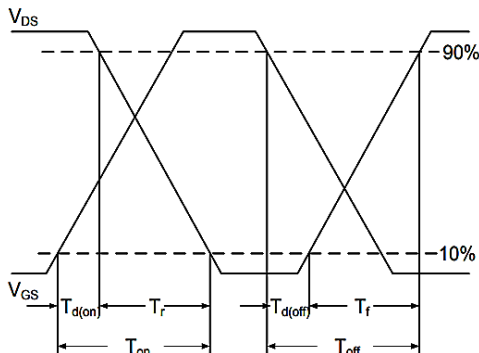
ELECTRICAL CHARACTERISTICS

Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	BV_{DSS}	650	--	--	V
Drain-Source Leakage Current	$V_{DS}=650V, V_{GS}=0V$	I_{DSS}	--	--	1	μA
Gate-Body Leakage Current, Forward	$V_{GS}=20V, V_{DS}=0V$	I_{GSSF}	--	--	100	nA
Gate-Body Leakage Current, Reverse	$V_{GS}=-20V, V_{DS}=0V$	I_{GSSR}	--	--	-100	nA
On Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	$R_{DS(ON)}$	--	0.046	0.056	Ω
Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	$V_{GS(th)}$	2.5	--	4.5	V
Dynamic Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Total Gate Charge	$V_{DS}=520V, V_{GS}=10V, I_D=10A$	Q_g	--	100	--	nC
Gate-Source Charge		Q_{gs}	--	17	--	nC
Gate-Drain Charge		Q_{gd}	--	41	--	nC
Turn-On Delay Time	$V_{DD}=520V, V_{GS}=10V, R_G=10\Omega, I_D=10A$	$T_{d(on)}$	--	45	--	ns
Rise Time		T_r	--	23	--	ns
Turn-Off Delay Time		$T_{d(off)}$	--	199	--	ns
Fall Time		T_f	--	10	--	ns
Input Capacitance	$V_{DS}=100V, V_{GS}=0V, F=1MHz$	C_{iss}	--	2935	--	pF
Output Capacitance		C_{oss}	--	125	--	pF
Reverse Transfer Capacitance		C_{rss}	--	10	--	pF
Drain-Source Body Diode	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Diode Forward Current	--	I_S	--	--	46.7	A
Diode Forward Voltage	$V_{GS}=0V, I_S=20A, T_J=25^\circ C$	V_{SD}	--	--	1.5	V
Reverse Recovery Time	$I_D=20A, di/dt=75A/\mu s$	T_{rr}	--	449	--	ns
Reverse Recovery Charge		Q_{rr}	--	5.71	--	nC
Peak Reverse Recovery Current		I_{rrm}	--	21.7	--	A

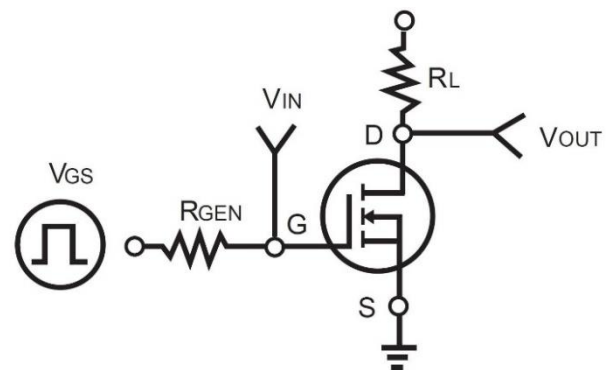
Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
3. Guaranteed by design, not subject to production testing.
4. Limited only by maximum temperature allowed.
5. Pulse Width Limited by safe operating area.
6. Full Package $I_{S(MAX)}=24.7A$, V_{SD} test condition $I_S = 24.7A$
7. $L=37.5mH$, $I_{AS} = 5A$, $V_{DD}= 60V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

Switching Time Waveform

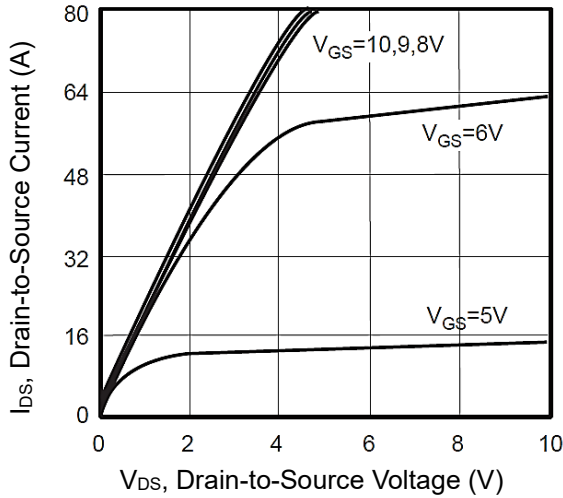


Switching Test Circuit

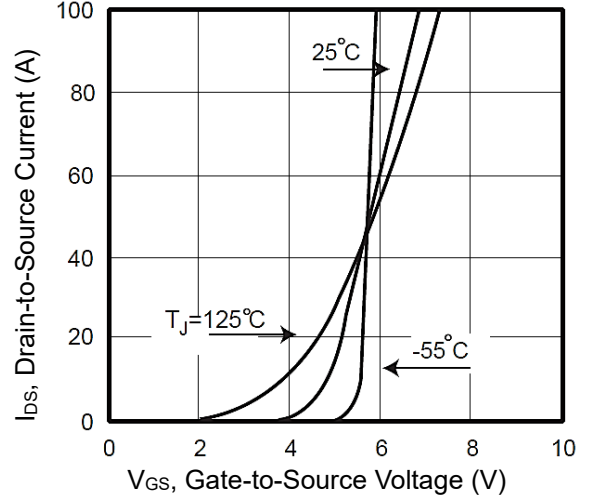


CHARACTERISTIC CURVES

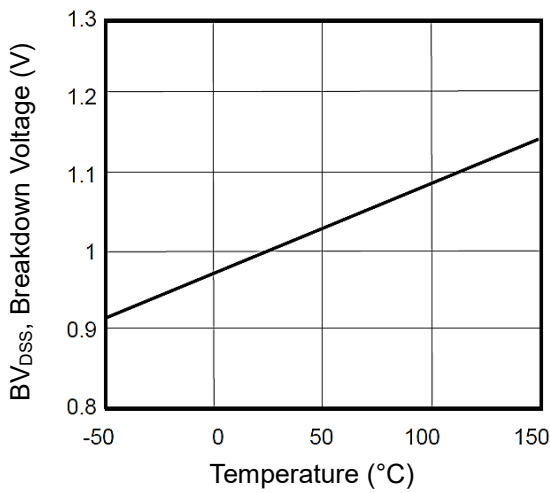
Output Characteristics



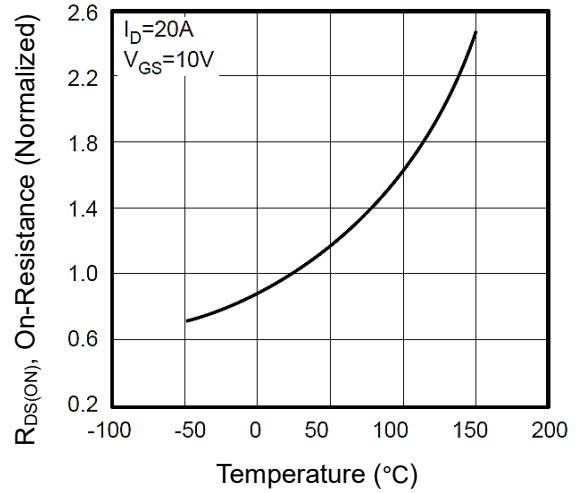
Transfer Characteristics



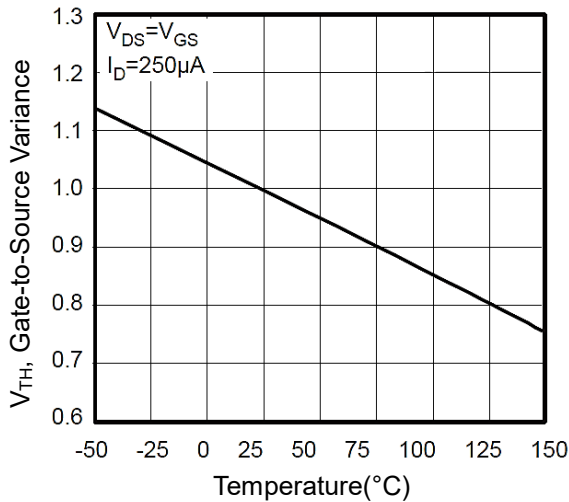
Breakdown Voltage vs. Temperature



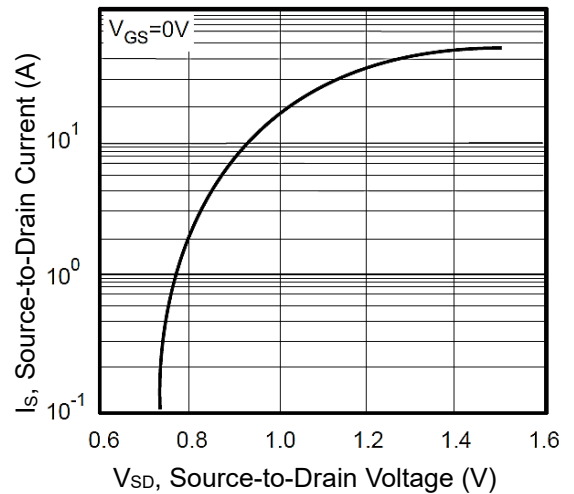
On-Resistance vs. Junction temperature



Threshold Voltage Variation with Temperature

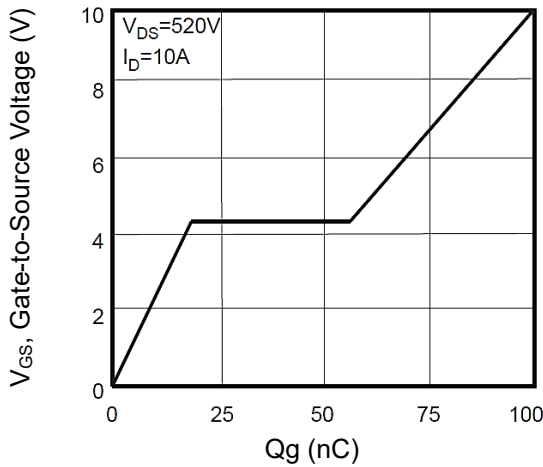


Body Diode Characteristics

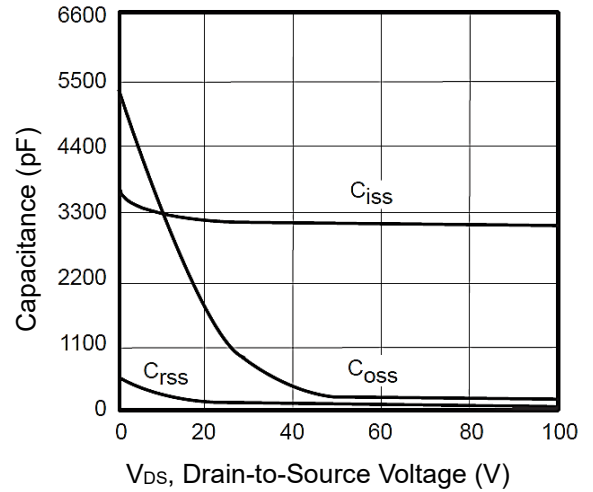


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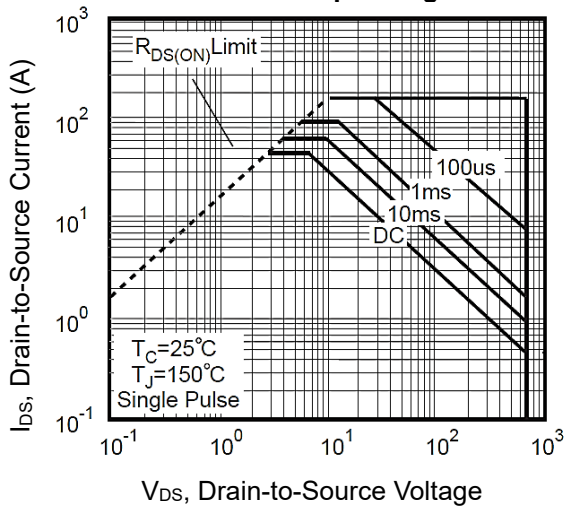
Gate-Charge Characteristics



Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area



Normalized Transient Thermal Impedance vs Pulse Width

