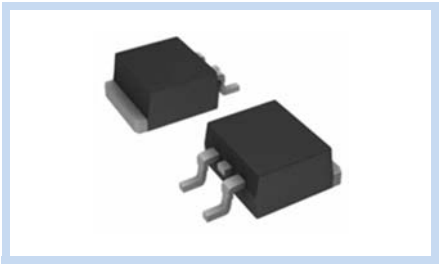
N-Channel MOSFET
100V 120A 138W TO-263

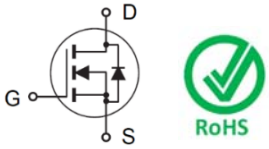
MFT10N120T263

MERITEK

FEATURE

- $R_{DS(ON)}$<5mΩ, V_{GS}=10V, I_D=50A
- $R_{DS(ON)}$<7mΩ, V_{GS}=6V, I_D=25A
- High Switch Speed
- Low Reverse Transfer Capacitance





RoHS

MECHANICAL DATA

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

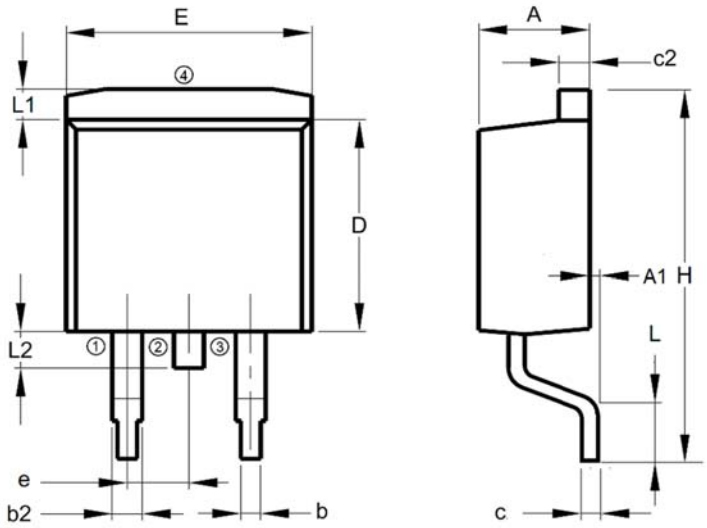
MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C=25°C	I_D	120	A
	T_C=100°C		76	
Drain Current – Pulsed	T_C=25°C	I_{DM}	480	A
Power Dissipation	T_C=25°C	P_D	138	W
	T_C=100°C		55	
Single Pulsed Avalanche Energy		E_{AS}	318	mJ
Single Pulsed Avalanche Current		I_{AS}	50	A
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	60	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	0.9	°C/W
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A	4.29	4.70
A1	--	0.25
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
H	14.61	15.88
L	2.24	2.84
L1	--	1.40
L2	0.96	1.78

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



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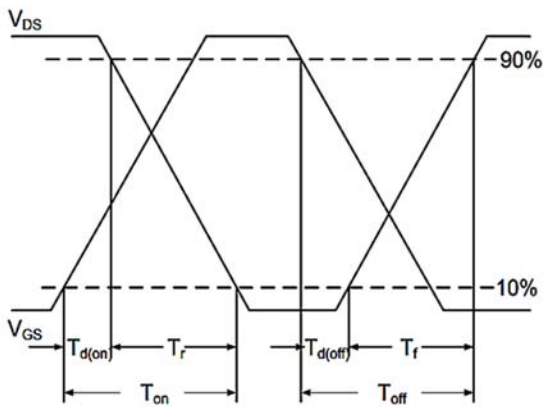
ELECTRICAL CHARACTERISTICS

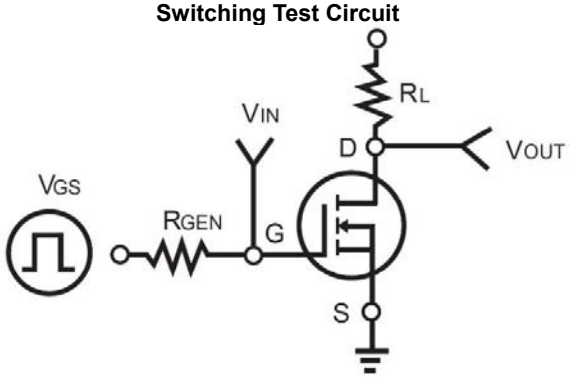
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	100	-	-	V
Drain-Source Leakage Current	V_{DS}=100V, V_{GS}=0V	I_{DSS}	-	-	1	μA
Gate-Body Leakage Current, Forward	V_{GS}=20V, V_{DS}=0V	I_{GSSF}	-	-	100	nA
Gate-Body Leakage Current, Reverse	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=50A	$R_{DS(ON)}$	-	4.3	5.0	mΩ
	V_{GS}=6V, I_D=25A		-	5.4	7.0	
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=270μA	$V_{GS\ (th)}$	1.8	2.8	3.8	V
Forward Transconductance	V_{DS}=10V, I_D=50A	g_{fs}	-	100	-	S
Gate Resistance	f=1.0MHz	R_g	-	0.8	1.6	Ω
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=50V, V_{GS}=10V, I_D=50A	Q_g	-	40.5	53	nC
Gate-Source Charge		Q_{gs}	-	15	-	
Gate-Drain Charge		Q_{gd}	-	6	-	
Gate Plateau Voltage		$V_{plateau}$	-	5	-	V
Turn-On Delay Time	V_{DD}=50V, V_{GS}=10V, R_G=3.0Ω I_D=50A	$T_{d(on)}$	-	16	-	ns
Rise Time		T_r	-	6	-	
Turn-Off Delay Time		$T_{d(off)}$	-	25	-	
Fall Time		T_f	-	6	-	
Input Capacitance	V_{DS}=50V, V_{GS}=0V, F=250KHz	C_{iss}	-	3010	3910	pF
Output Capacitance		C_{oss}	-	1080	1400	
Reverse Transfer Capacitance		C_{rss}	-	14	-	
Output Charge	V_{DS}=50V, V_{GS}=0V	Q_{OSS}	-	85	110	nC
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Voltage	V_{GS}=0V, I_S=50A, T_J=25°C	V_{SD}	-	0.9	1.2	V
Reverse Recovery Time	V_{DD}=50V, I_D=50A, di/dt=100A/μs	T_{rr}	-	56	112	ns
Reverse Recovery Charge		Q_{rr}	-	85	170	nC

Note:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
3. Guaranteed by design, not subject to production testing.
4. E_{AS} is calculated based on the condition of L=1.0mH, I_{AS} = 25.2A, V_{DD}= 50V, V_{GS}= 10V. 100% test at L=0.1mH, I_{AS} = 50A in production.
5. $R_{\theta JA}$ is the sum of junction to case by maximum junction temperature and thermal impedance. It can be varied by application and environment.
6. Essentially independent of operating temperature typical characteristics.

Switching Time Waveform

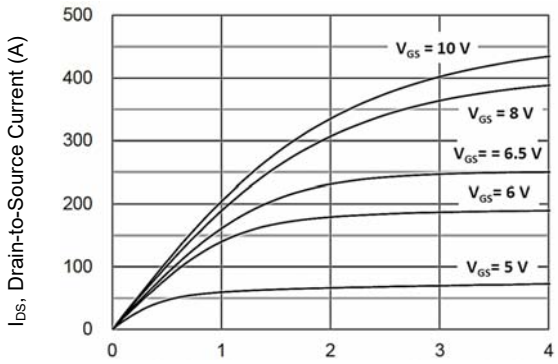


Switching Test Circuit

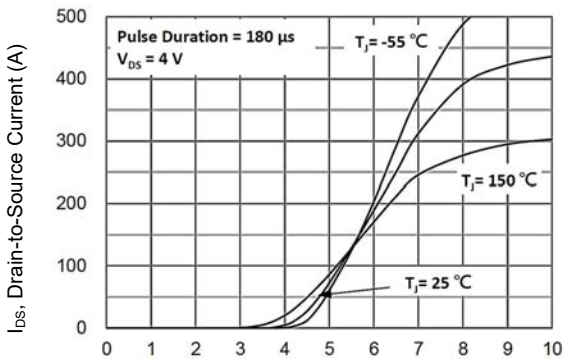


CHARACTERISTIC CURVES

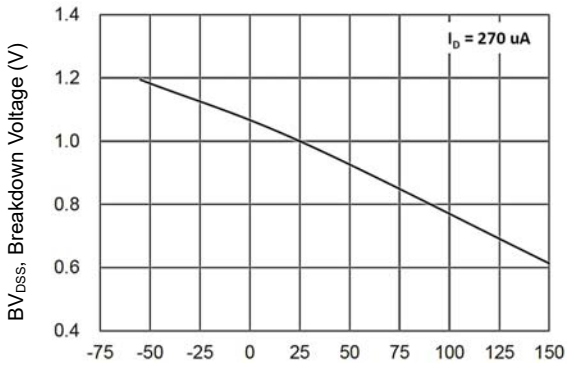
Output Characteristics



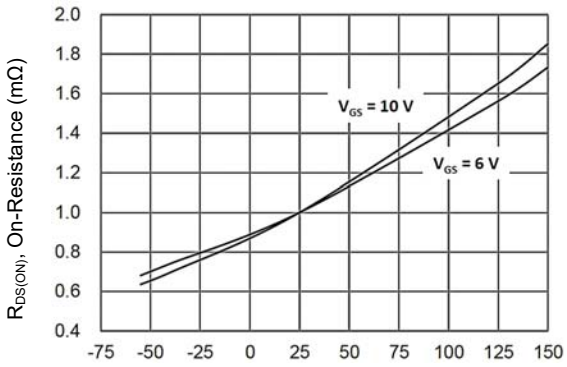
Transfer Characteristics



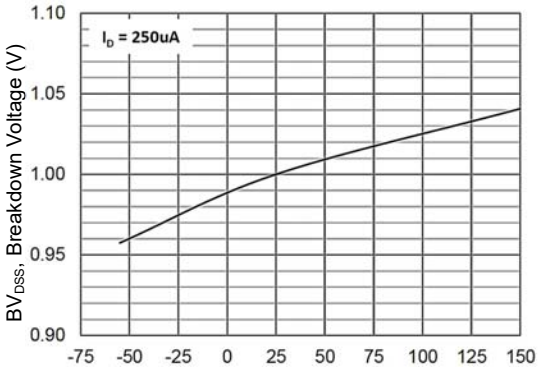
Threshold Voltage Variation with Temperature



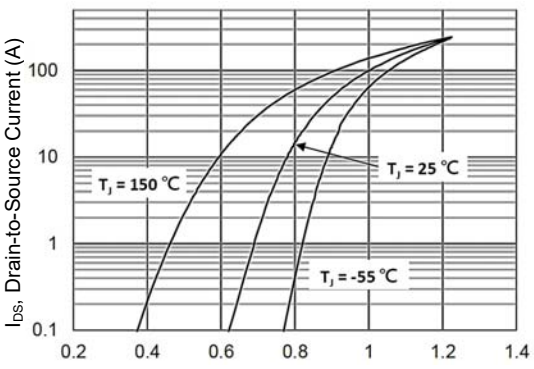
On-Resistance vs. Junction temperature



Breakdown Voltage vs. Temperature

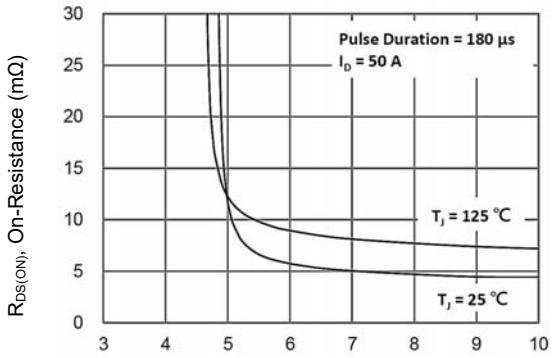


Body Diode Characteristics



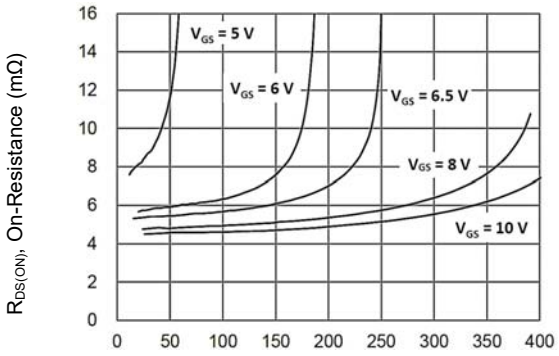
CHARACTERISTIC CURVES

On-Resistance Variation with V_{GS}



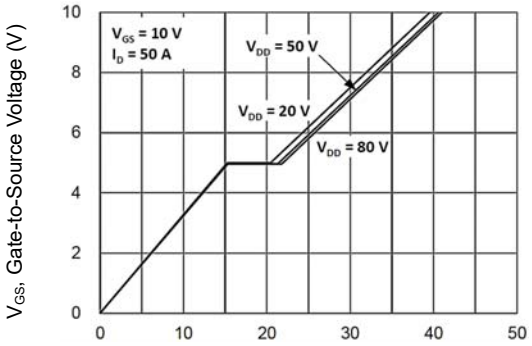
V_{GS}, Gate-to-Source Voltage (V)

On-Resistance vs. Drain Current



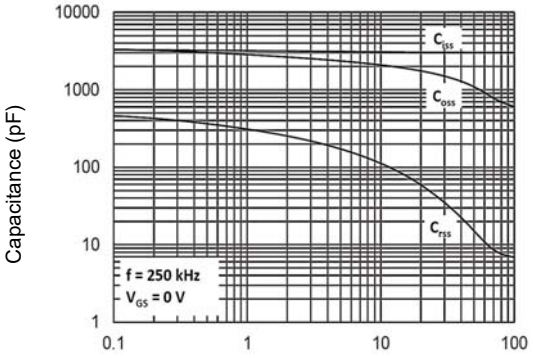
I_{DS}, Drain-to-Source Current (A)

Gate-Charge Characteristics



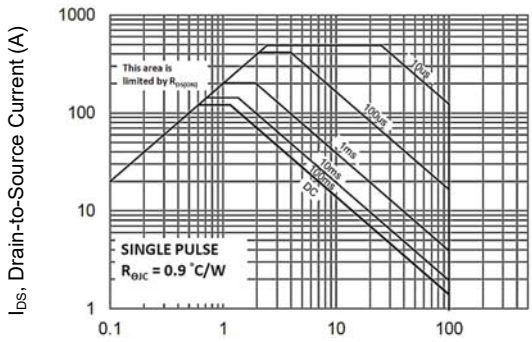
Qg (nC)

Capacitance vs. Drain-Source Voltage



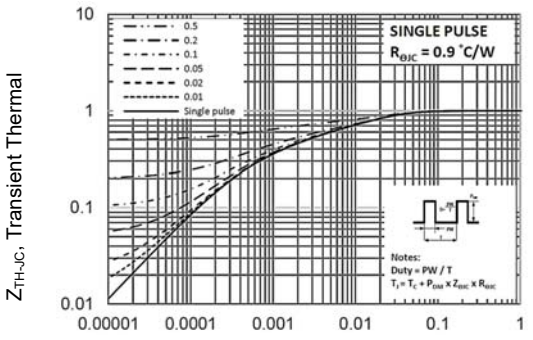
V_{DS}, Drain-to-Source Voltage (V)

Maximum Safe Operating Area



V_{DS}, Drain-to-Source Voltage (V)

Normalized Transient Thermal Impedance vs Pulse Width



t, Pulse Width (Sec)

ORDERING INFORMATON

Part number	Package	Packaging
MFT10N120T263	**TO-263**	800pcs / Reel
MFT10N120T263U	**TO-263**	50pcs / Tube