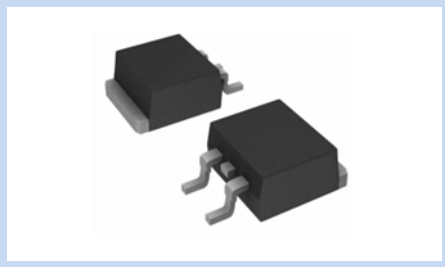
P-Channel MOSFET
60V 40A TO-263

MFT6P40T263

MERITEK

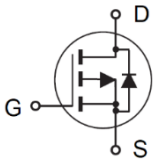
FEATURE

- $R_{DS(ON)}$=19mΩ at V_{GS}=-10V, I_D=-40A
- $R_{DS(ON)}$=25mΩ at V_{GS}=-4.5V, I_D=-40A
- High Power and Current Handing 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



RoHS

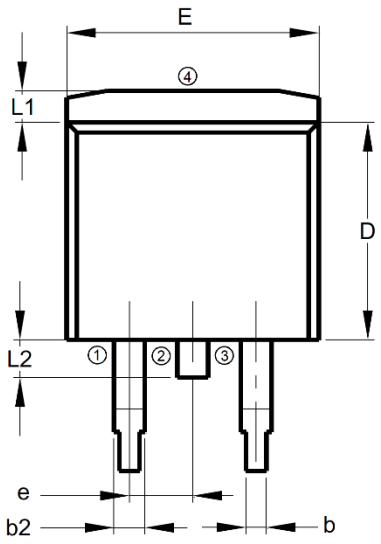
MAXIMUM RATINGS

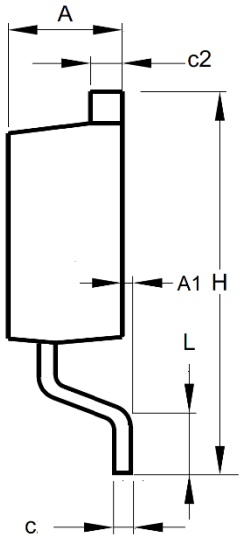
Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C=25°C	I_D	-40	A
			-25	
Drain Current – Pulsed		I_{DM}	-160	A
Power Dissipation	T_C=25°C	P_D	60	W
	Derate above 25°C		0.48	W/°C
Single Pulsed Avalanche Energy		E_{AS}	113	mJ
Single Pulsed Avalanche Current		I_{AS}	15	A
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	62.5	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	2.1	°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



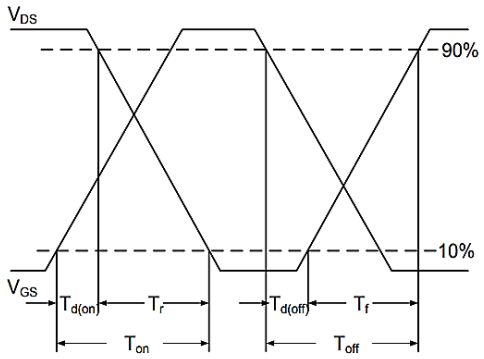


ELECTRICAL CHARACTERISTICS

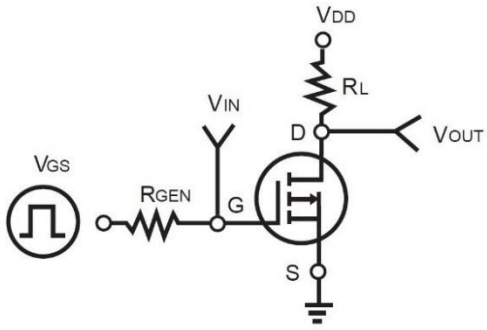
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	-60	-	-	V
Drain-Source Leakage Current	V_{DS}= -60V, V_{GS}=0V	I_{DSS}	-	-	-1	μA
Gate-Body Leakage Current, Forward	V_{GS}=20V, V_{DS}=0V	I_{GSSF}	-	-	100	nA
Gate-Body Leakage Current, 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=30A	$R_{DS(ON)}$	-	15	19	mΩ
	V_{GS}= -4.5V, I_D=30A		-	18	25	mΩ
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	$V_{GS(th)}$	-1	-	-3	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=80V, V_{GS}=10V, I_D=30A	Q_g	-	38	-	nC
Gate-Source Charge		Q_{gs}	-	8	-	
Gate-Drain Charge		Q_{gd}	-	18	-	
Turn-On Delay Time	V_{DD}= -48V, V_{GS}= -10V, R_G=6Ω, I_D= -20A	$T_{d(on)}$	-	18	-	ns
Rise Time		T_r	-	10	-	
Turn-Off Delay Time		$T_{d(off)}$	-	115	-	
Fall Time		T_f	-	38	-	
Input Capacitance	V_{DS}= -25V, V_{GS}=0V, F=1MHz	C_{iss}	-	2845	-	pF
Output Capacitance		C_{oss}	-	295	-	
Reverse Transfer Capacitance		C_{rss}	-	165	-	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Drain-Source Diode Forward Current	--	I_S	-	-	-40	A
Diode Forward Voltage	V_{GS}=0V, I_S= -20A, T_J=25°C	V_{SD}	-	-	-1.2	V

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. L=1mH, I_{AS} = 15A, V_{DD}= 24V, R_G=25Ω, Starting T_J=25°C

Switching Time Waveform

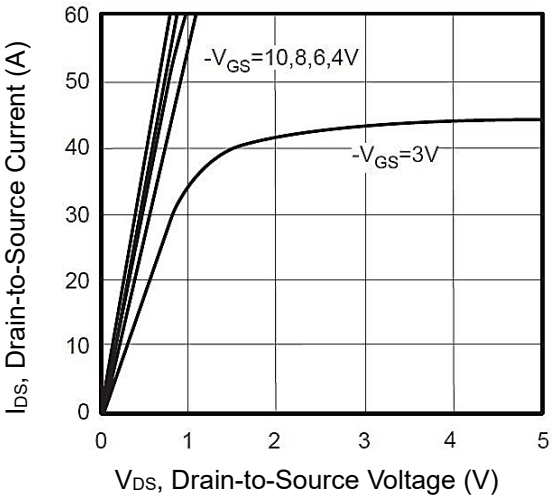


Switching Test Circuit

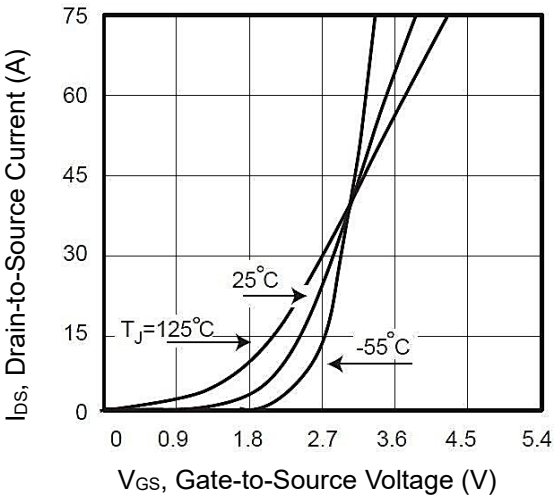


CHARACTERISTIC CURVES

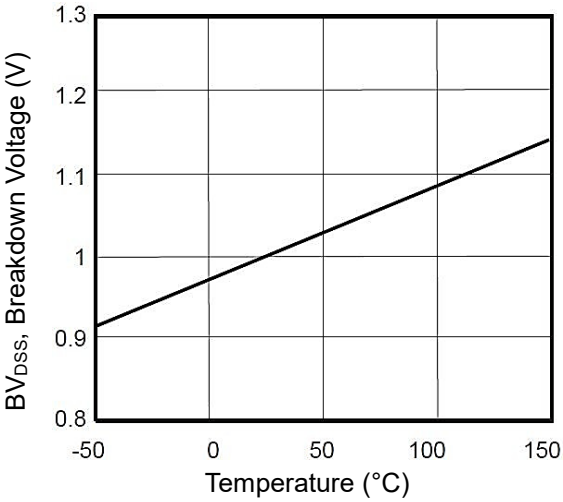
Output Characteristics



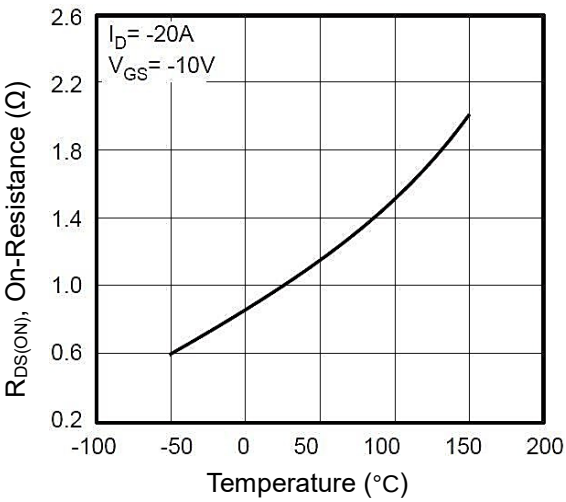
Transfer Characteristics



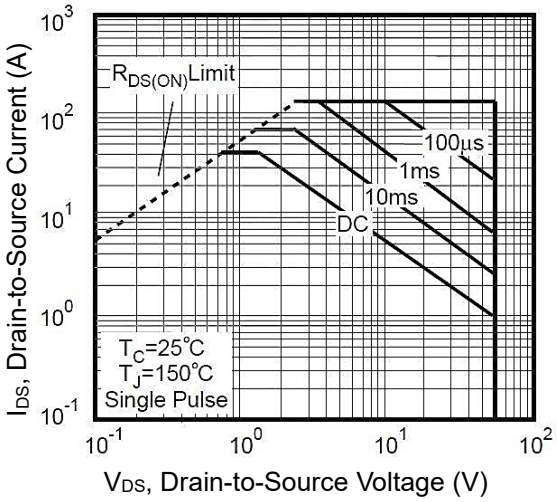
Threshold Voltage Variation with Temperature



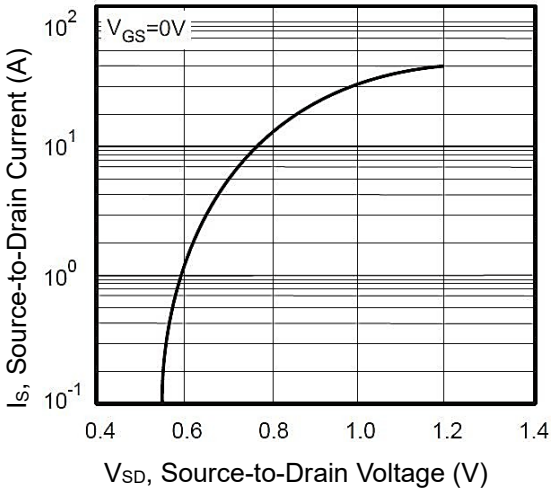
On-Resistance vs. Junction temperature



Maximum Safe Operating Area

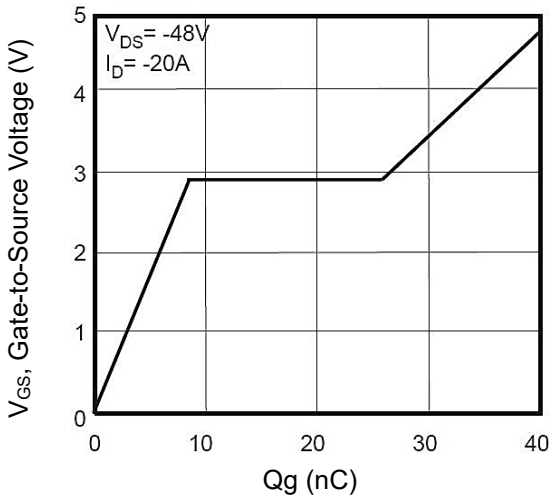


Body Diode Characteristics

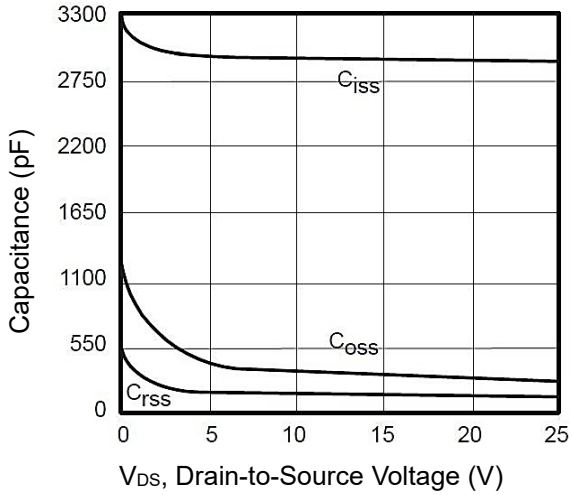


CHARACTERISTIC CURVES

Gate-Charge Characteristics



Capacitance vs. Drain-Source Voltage



Normalized Transient Thermal Impedance vs Pulse Width