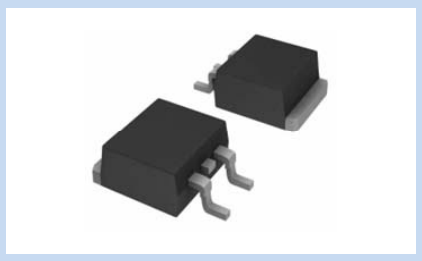
N-Channel MOSFET
65V 89A 68W TO-252

MFT6N89T252

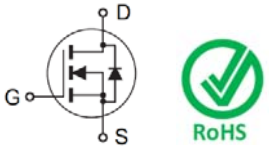
MERITEK

FEATURE



- $R_{DS(ON)}$<4.8mΩ, V_{GS}=10V, I_D=20A
- $R_{DS(ON)}$<7.8mΩ, V_{GS}=4.5V, I_D=15A
- High Power and Current Handing Capability
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- Lead free in compliance with EU RoHS 2.0

MECHANICAL DATA



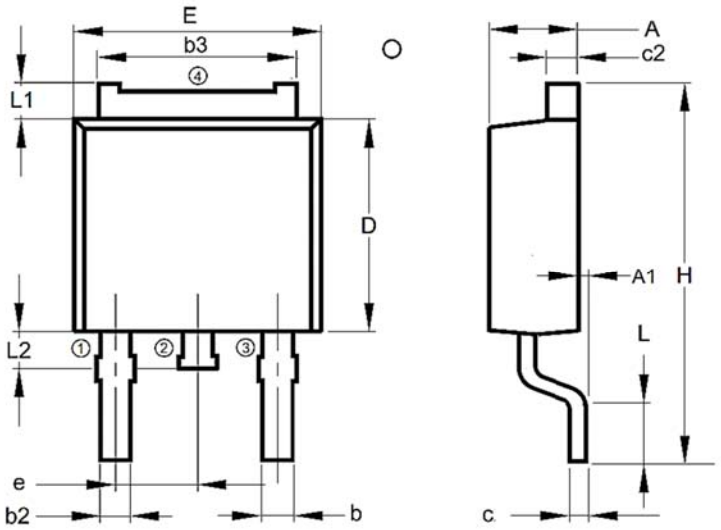
- Case: T0-252 Package
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	65	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C=25°C	I_D	89	A
	T_C=100°C		63	A
Drain Current – Pulsed	T_C=25°C	I_{DM}	356	A
Power Dissipation	T_C=25°C	P_D	68	W
	Derate above 25°C		0.45	W
Single Pulse Avalanche Energy		E_{AS}	250	mJ
Single Pulse Avalanche Current		I_{AS}	10	A
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	50	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	2.2	°C/W
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to 175	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A	2.20	2.40
A1	--	0.13
b	0.50	0.90
b2	0.76	1.14
b3	4.95	5.59
c	0.40	0.61
c2	0.45	0.89
D	5.40	6.63
E	6.05	7.10
e	1.98	2.59
H	8.80	10.60
L	0.25	--
L1	0.70	1.78
L2	0.50	1.20



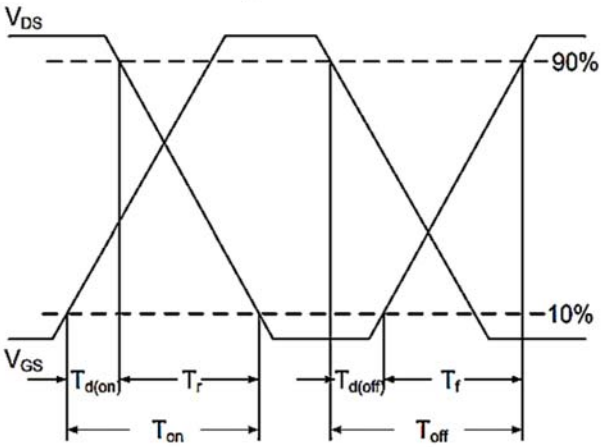
Note: 1: Gate, 2, 4: Drain, 3: Source

ELECTRICAL CHARACTERISTICS

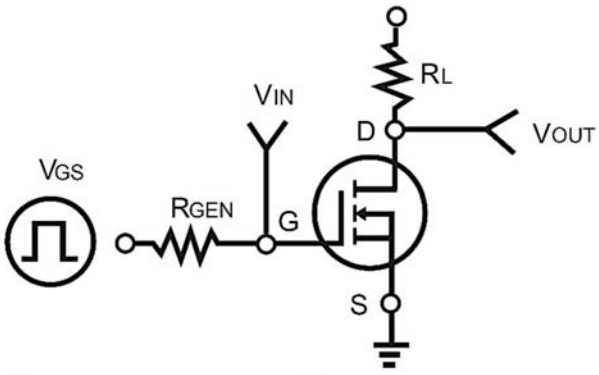
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	65	--	--	V
Drain-Source Leakage Current	V_{DS}=65V, V_{GS}=0V	I_{DSS}	--	--	1	μA
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	$R_{DS(ON)}$	--	4	4.8	mΩ
	V_{GS}=4.5V, I_D=15A		--	6	7.8	
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}=30V, I_D=20A, V_{GS}=4.5V	Q_g	--	26	--	nC
Gate-Source Charge		Q_{gs}	--	4	--	nC
Gate-Drain Charge		Q_{gd}	--	15	--	nC
Turn-On Delay Time	V_{DD}=30V, I_D=20A, V_{GS}=10V, R_G=25Ω	$T_{d(on)}$	--	22	--	ns
Rise Time		T_r	--	28	--	ns
Turn-Off Delay Time		$T_{d(off)}$	--	143	--	ns
Fall Time		T_f	--	90	--	ns
Input Capacitance	V_{DS}=30V, V_{GS}=0V, F=1MHz	C_{iss}	--	1790	--	pF
Output Capacitance		C_{oss}	--	725	--	pF
Reverse Transfer Capacitance		C_{rss}	--	15	--	pF
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Drain-Source Diode Forward Current	--	I_S	--	--	56	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. Device Mounted on FR4 Board, t≤10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
4. Guaranteed by design, not subject to production testing.
5. L=5mH I_{AS}=10A,V_{DD}=24V, R_G=25Ω

Switching Time Waveform

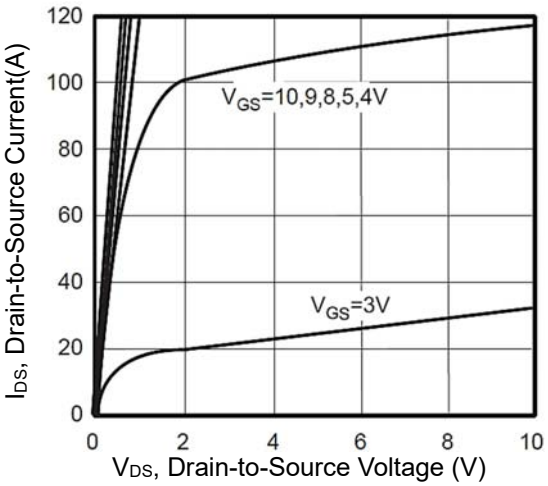


Switching Test Circuit

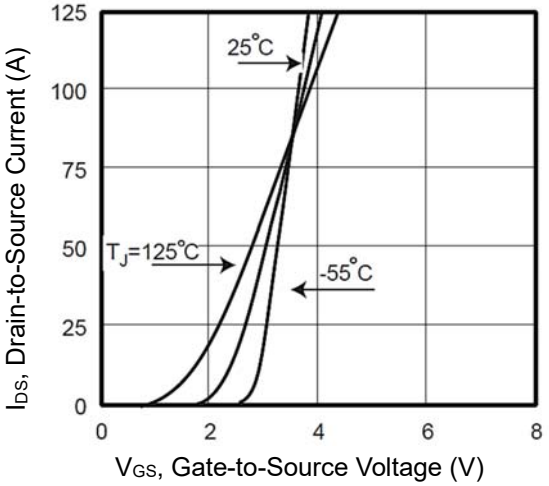


CHARACTERISTIC CURVES

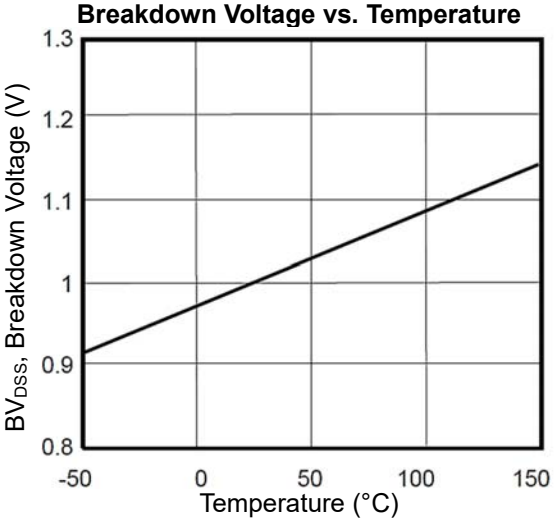
Output Characteristics



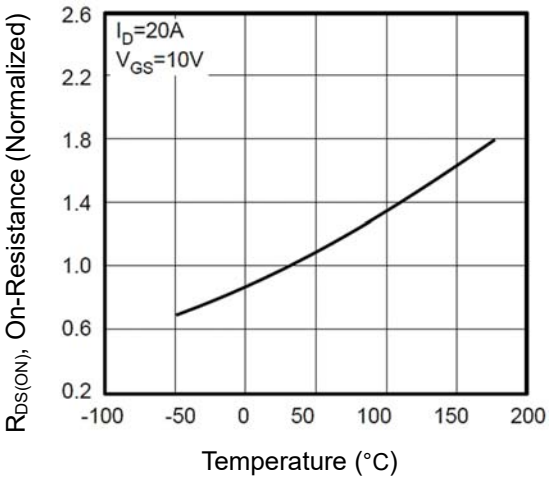
Transfer Characteristics



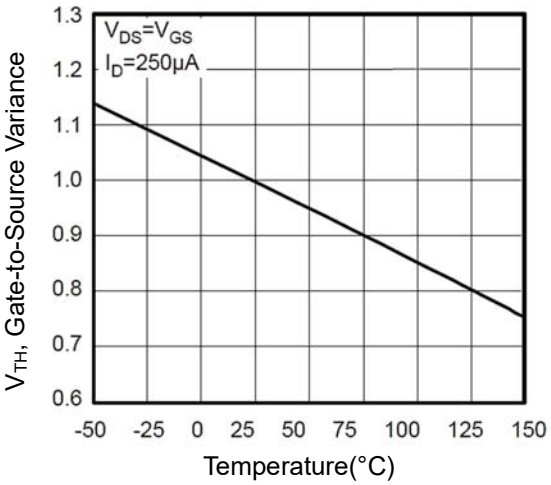
Breakdown Voltage vs. Temperature



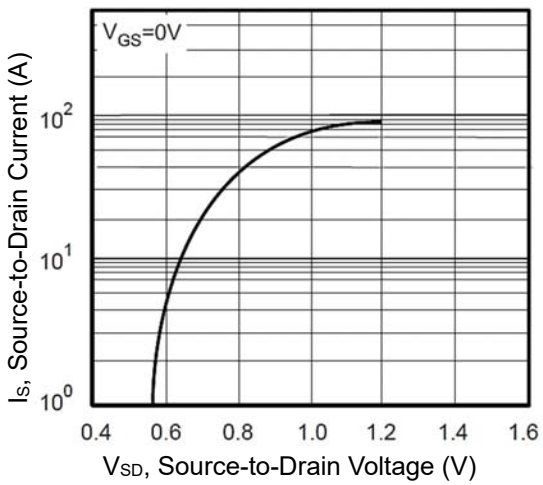
On-Resistance vs. Junction temperature



Threshold Voltage Variation with Temperature

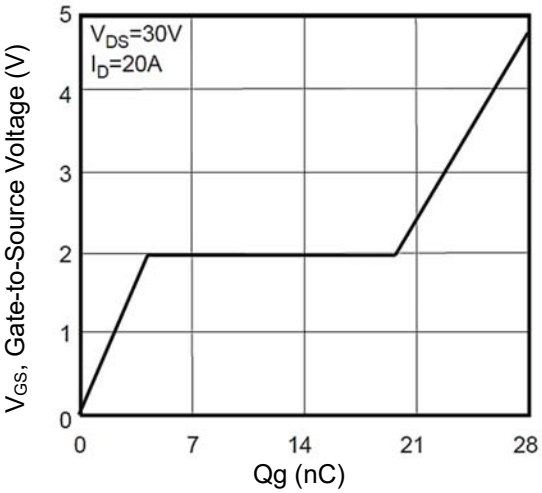


Body Diode Characteristics

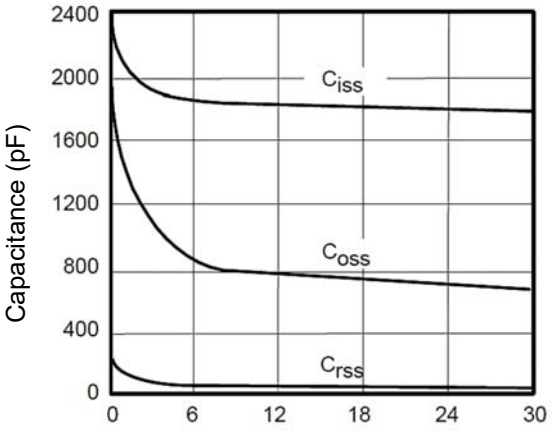


CHARACTERISTIC CURVES

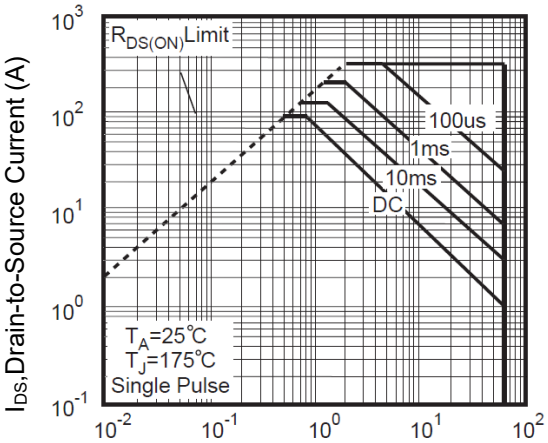
Gate-Charge Characteristics



Capacitance vs. Drain-Source Voltage



Maximum Safe Operating Area



Normalized Transient Thermal Impedance vs Pulse Width