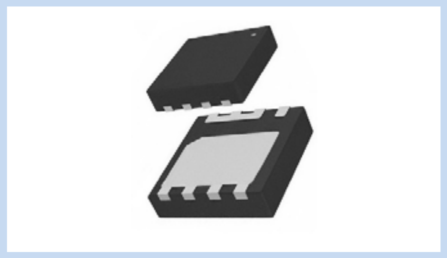
N-Channel MOSFET
60V 54A 41.7W DFN3x3-8

MFT6N54D33

MERITEK

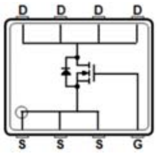
FEATURE

- $R_{DS(ON)}$<9mΩ, V_{GS}=10V, I_D=54A
- $R_{DS(ON)}$<13mΩ, V_{GS}=4.5V, I_D=54A
- Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
- High Power And Current Handing Capability



MECHANICAL DATA

- Case: DFN3x3-8 package
- Terminal: Solderable per MIL-STD-750, Method 2026



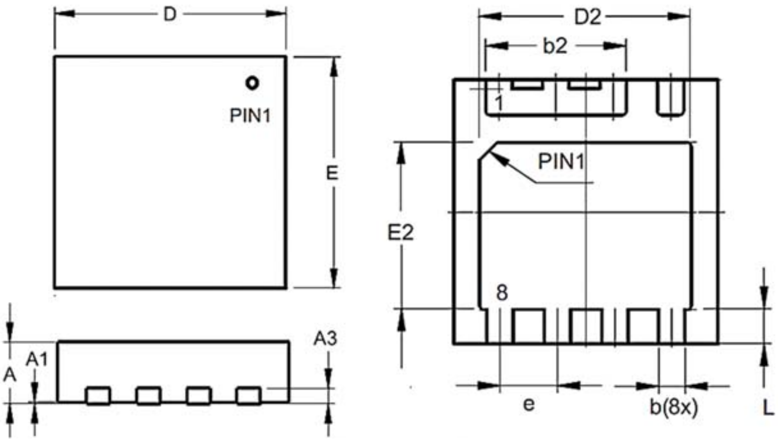
RoHS

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	at $R_{\theta JC}$	I_D	54	A
	at $R_{\theta JA}$		13	
Drain Current – Pulsed	at $R_{\theta JC}$	I_{DM}	216	A
	at $R_{\theta JA}$		52	
Maximum Power Dissipation		P_D	41.7	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C
Thermal Resistance, Junction-to-Case		$R_{\theta JC}$	3	°C/W
Thermal Resistance, Junction-to-Ambient		$R_{\theta JA}$	50	°C/W

DIMENSIONS

Item	Min (mm)	Max (mm)
A	0.57	0.63
A1	0.00	0.05
A3	-	0.152
b	0.25	0.35
D	2.45	2.55
D2	1.55	1.65
E	2.25	2.35
E2	1.18	1.28
e	-	0.65
L	0.30	0.40

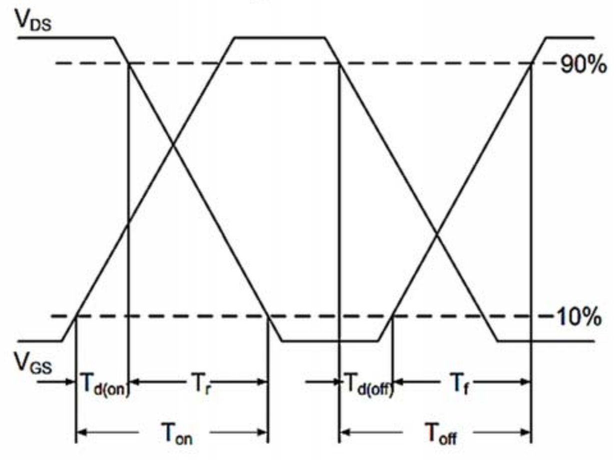


ELECTRICAL CHARACTERISTICS

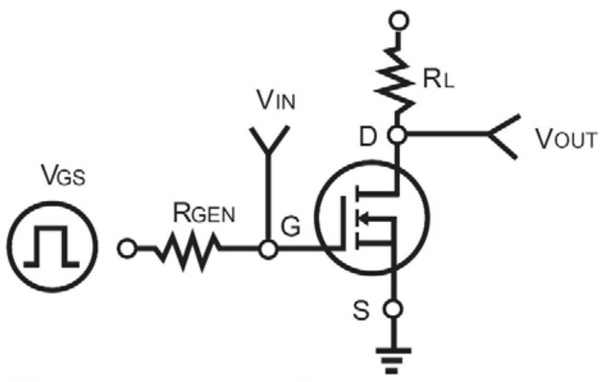
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V , I_D= 250μA	BV_{DSS}	60	-	-	V
Zero Gate Voltage Drain Current	V_{DS}=60V , V_{GS}=0V	I_{DSS}	-	-	1	μA
Gate Body Leakage Current, Reverse	V_{DS}=20V , V_{GS}=0V	I_{GSSR}	-	-	100	uA
Gate Body Leakage Current, Forward	V_{GS}=-20V , V_{DS}=0V	I_{GSSF}	-	-	-100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	$V_{GS(th)}$	1	-	3	V
Static Drain-Source On-Resistance	V_{GS}=10V , I_D=8A	$R_{DS(ON)}$	-	7	9	mΩ
	V_{GS}=4.5V , I_D=8A		-	9	13	
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Input Capacitance	V_{DS}=25V, V_{GS}=0V, F=1MHz	C_{iss}	-	1215	-	pF
Output Capacitance		C_{oss}	-	535	-	
Reverse Transfer Capacitance		C_{rss}	-	10	-	
Turn-On Delay Time	V_{DD}=48V, I_D=10A V_{GS}=10V, R_{GEN}=6Ω	$T_{d(on)}$	-	20	-	nS
Turn-On Rise Time		T_r	-	5	-	
Turn-Off Delay Time		$T_{d(off)}$	-	42	-	
Turn-Off Fall Time		T_f	-	8	-	
Total Gate Charge	V_{DS}=48V , I_D=10A , V_{GS}=4.5V	Q_g	-	10	-	nC
Gate-Source Charge		Q_{gs}	-	2.5	-	
Gate-Drain Charge		Q_{gd}	-	4.8	-	
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Drain-Source Diode Forward Current	-	I_S	-	-	45	A
Drain-Source Diode Forward Voltage	V_{GS}=0V , I_S= 8A	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

Switching Time Waveform

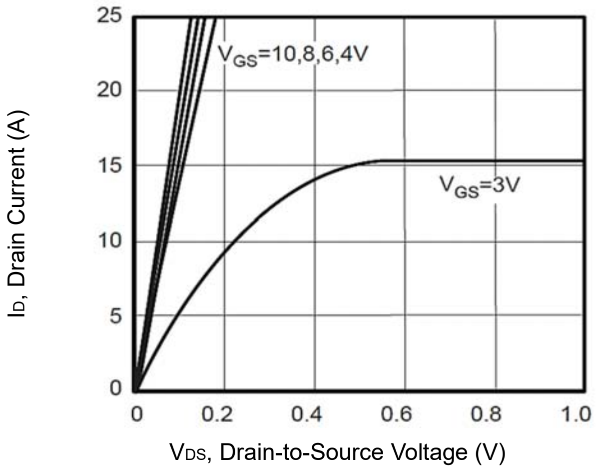


Switching Test Circuit

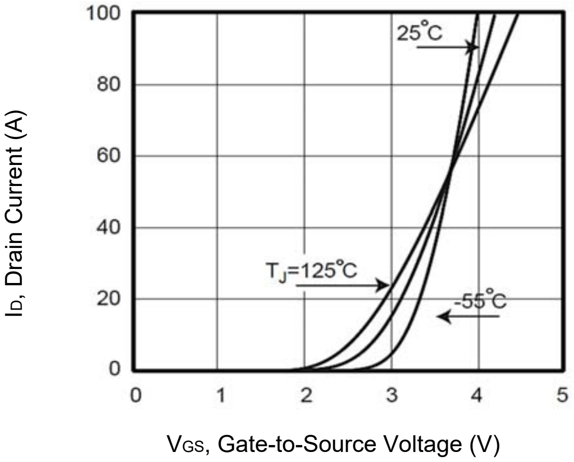


CHARACTERISTIC CURVES

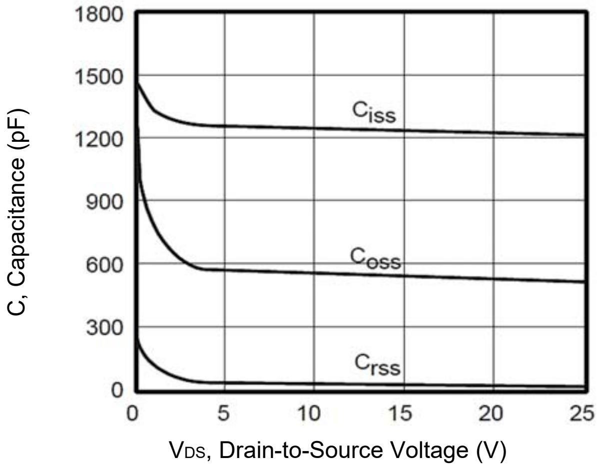
Output Characteristics



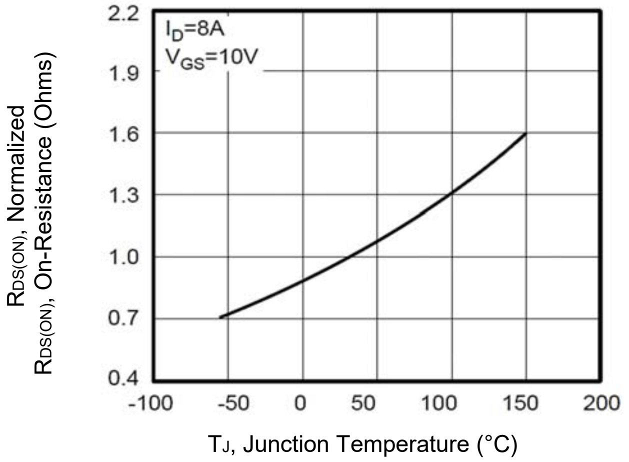
Transfer Characteristics



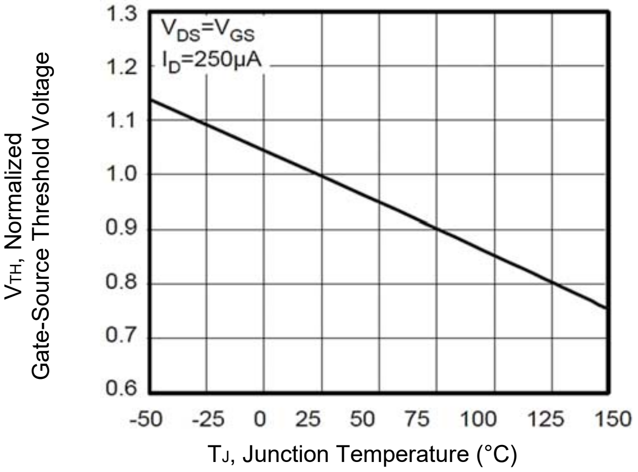
Capacitance



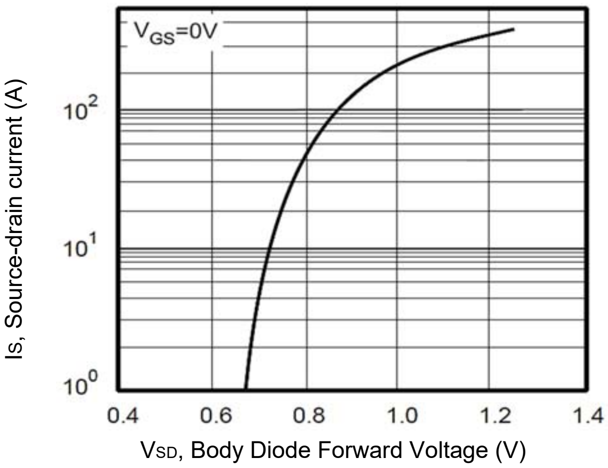
On-Resistance Variation with Temperature



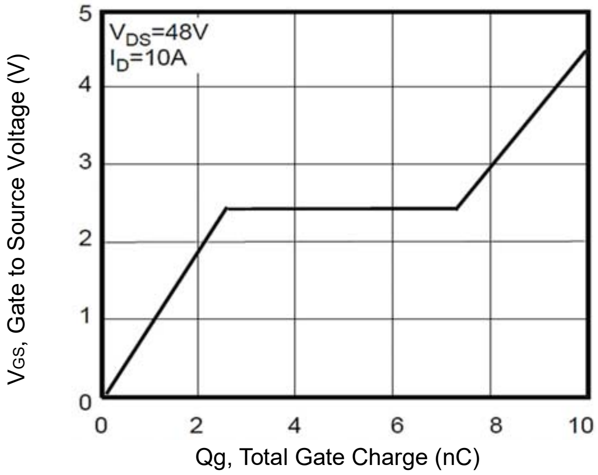
Gate Threshold Variation with Temperature



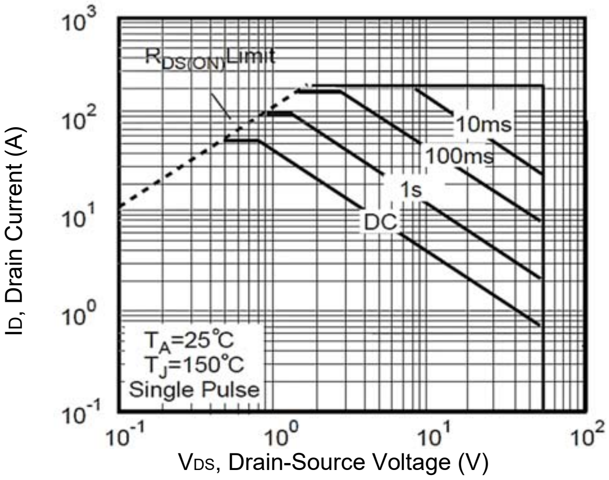
Body Diode



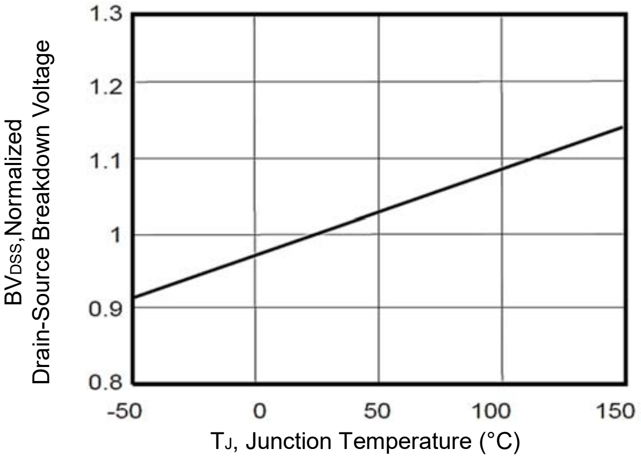
CHARACTERISTIC CURVES



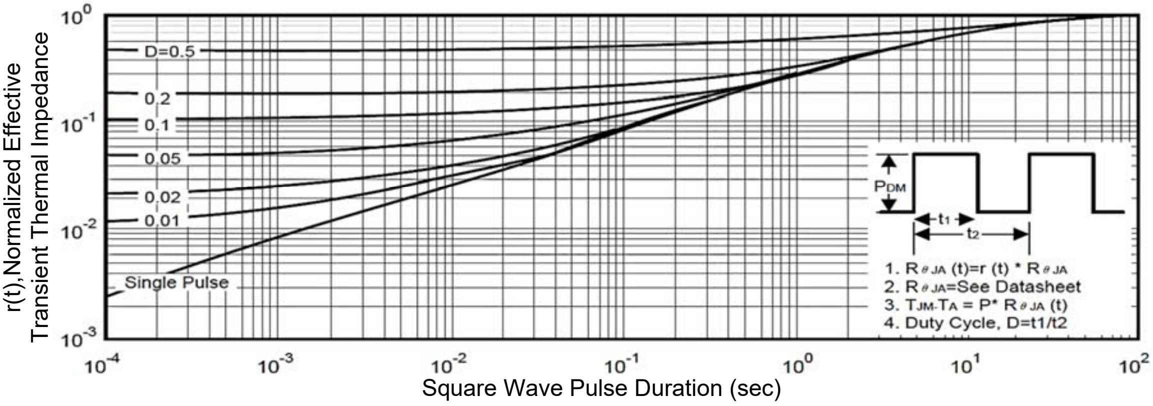
Gate Charge



Maximum Safe Operating Area



Breakdown Voltage Variation vs Temperature



Normalized Thermal Transient Impedance Curve