N-Channel MOSFET
60V 86A 83W DFN5X6

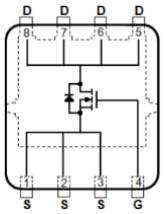
MFT6N86D56

MERITEK

FEATURE

- $R_{DS}(ON)$<5.6mΩ, V_{GS}=10V, I_D=20A
- $R_{DS}(ON)$<7.5mΩ, V_{GS}=4.5V, I_D=15A
- Super High Dense Cell Design for Extremely Low RDS(ON)
- High Power and Current Handing Capability
- Fast Switching

MECHANICAL DATA



RoHS

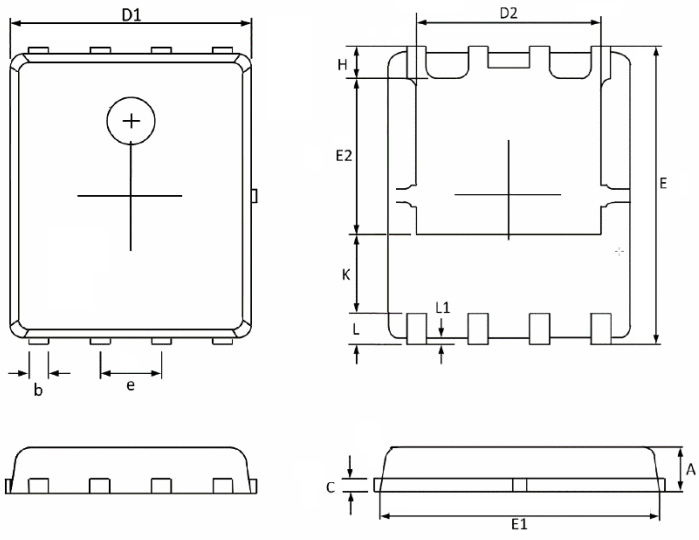
- Case: Molded Plastic, DFN5060 Package
- Terminal: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	I_D at T_A	I_D	23.5	A
	I_D at T_C		86	A
Drain Current – Pulsed	I_{DM} at T_A	I_{DM}	94	A
	I_{DM} at T_C		344	A
Single Pulsed Avalanche Energy		E_{AS}	180	mJ
Single Pulsed Avalanche Current		I_{AS}	60	A
Maximum Power Dissipation		P_D	83	W
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	20	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	1.5	°C/W
Operating Junction and Storage Temperature Range		$T_{J/STG}$	-55 to 150	°C

DIMENSIONS

Item	Min (mm)	Max (mm)
A	0.80	1.10
b	0.33	0.51
C	0.20	0.30
D1	4.80	5.10
D2	3.61	4.10
E	5.90	6.20
E1	5.70	5.90
E2	3.35	3.78
e	1.27BSC	
H	0.41	0.70
K	1.10	1.50
L	0.51	0.71
L1	0.06	0.20

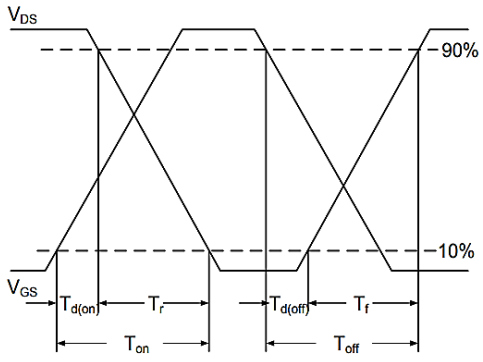


ELECTRICAL CHARACTERISTICS

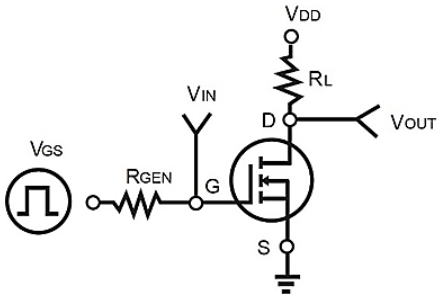
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	60	--	--	V
Drain-Source Leakage Current	V_{DS}=60V, V_{GS}=0V	I_{DSS}	--	--	1	μA
Gate Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=20A	$R_{DS(ON)}$	--	4.5	5.6	mΩ
	V_{GS}=4.5V, I_D=15A		--	5.5	7.5	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}=48V, V_{GS}=4.5V, I_D=20A	Q_g	--	48	--	nC
Gate-Source Charge		Q_{gs}	--	10	--	nC
Gate-Drain Charge		Q_{gd}	--	30	--	nC
Turn-On Delay Time	V_{DD}=48V, I_D=50A V_{GS}=4.5V, R_{GEN}=3.6Ω	$t_{d(on)}$	--	37	--	ns
Rise Time		t_r	--	38	--	ns
Turn-Off Delay Time		$t_{d(off)}$	--	49	--	ns
Fall Time		t_f	--	30	--	ns
Input Capacitance	V_{DS}=25V, V_{GS}=0V F=1.0MHz	C_{iss}	--	3520	--	pF
Output Capacitance		C_{oss}	--	360	--	pF
Reverse Transfer Capacitance		C_{rss}	--	225	--	pF
Gate input resistance	f=1MHz,open drain	R_g	--	2.7	--	Ω
Drain-Souse Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Continuous Source Current	--	I_S	--	--	80	A
Drain-Source Diode Forward Voltage	V_{GS}=0V , I_S=20A	V_{SD}	--	--	1	V

Note:
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≦ 300μs , Duty Cycle ≦ 2%.
3. Guareanteed by design, not subject to production testing
4. Surface Mounted on FR4 Board t<=10sec.
5. V_{DD}=25V,R_G=25Ω,L=0.1mH,I_{AS}=60A., Starting TJ=25℃

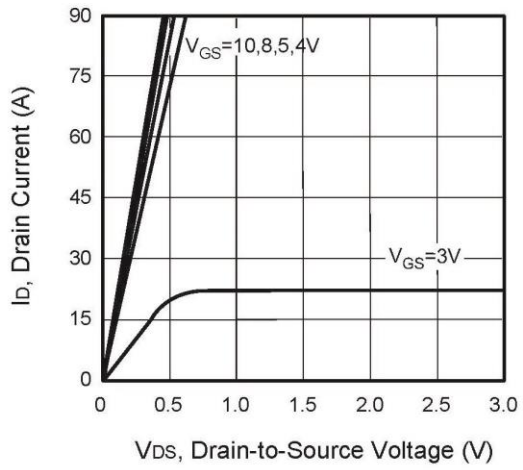
Switching Time Waveform



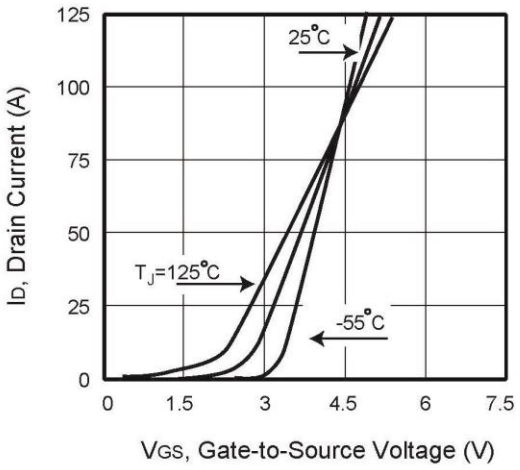
Switching Test Circuit



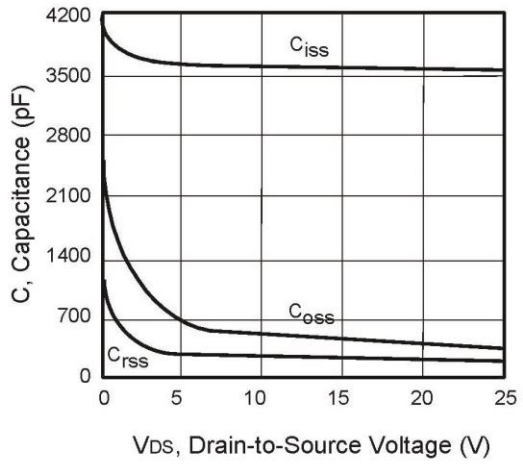
CHARACTERISTIC CURVES



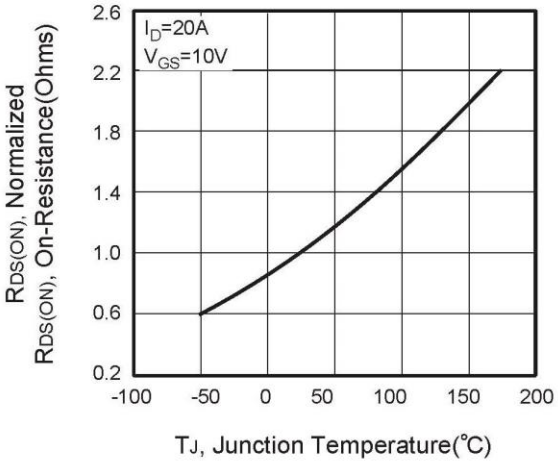
Output Characteristics



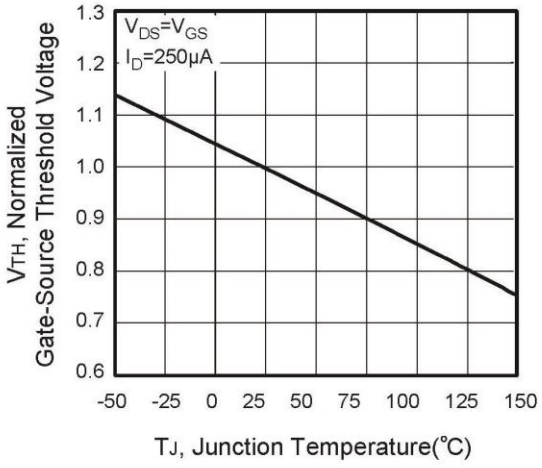
Transfer Characteristics



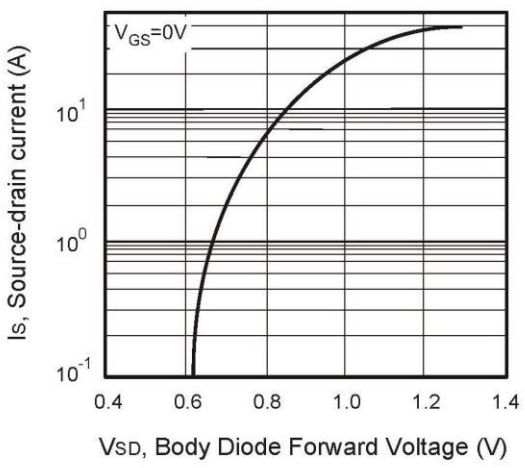
Capacitance



On-Resistance Variation with Temperature

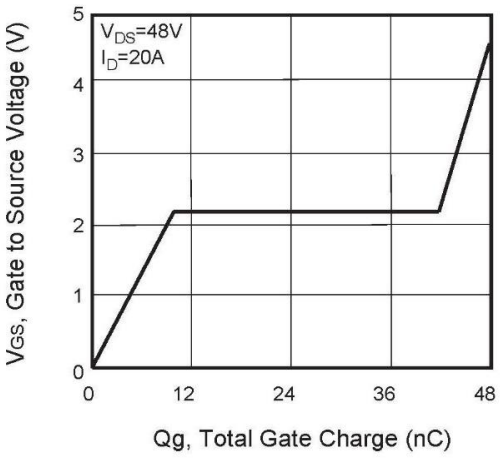


Gate Threshold Variation with Temperature

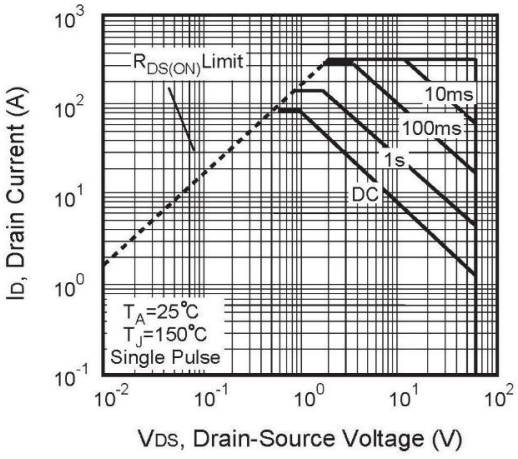


Body Diode Forward Voltage Variation with Source Current

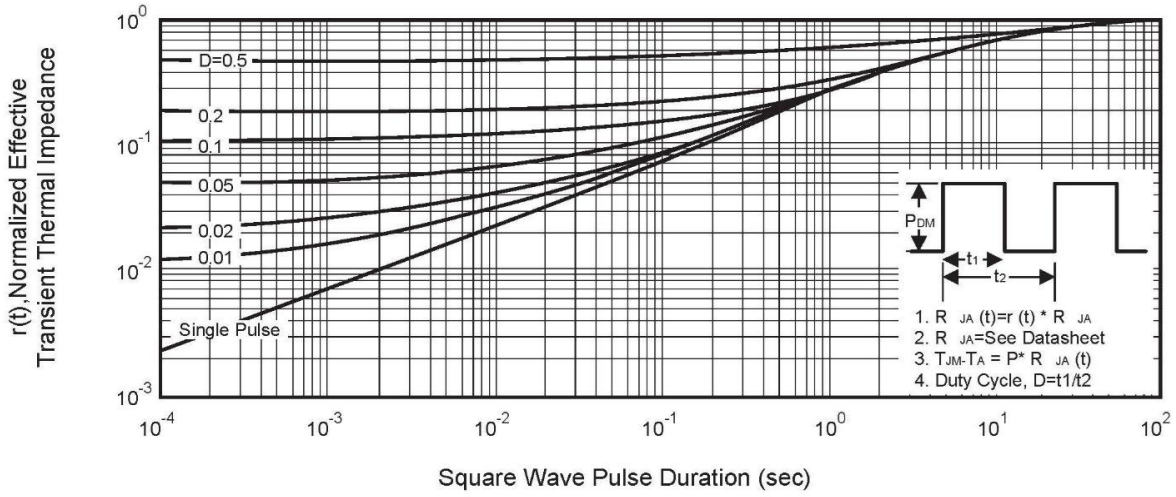
CHARACTERISTIC CURVES



Gate Charge



Maximum Safe Operating Area



Normalized Thermal Transient Impedance Curve