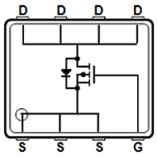
P Channel MOSFET
30V 90A 55W DFN5×6-8L

MFT3P90D56

MERITEK

FEATURE

- $R_{DS(ON)}$<4.3mΩ at V_{GS}=10V
- $R_{DS(ON)}$<8.0mΩ at V_{GS}=4.5V
- Super High Dense Cell Design For Low $R_{DS(ON)}$.
- Fast Switching Speed
- Application: DC/DC Converter, Motor Control



RoHS

MECHANICAL DATA

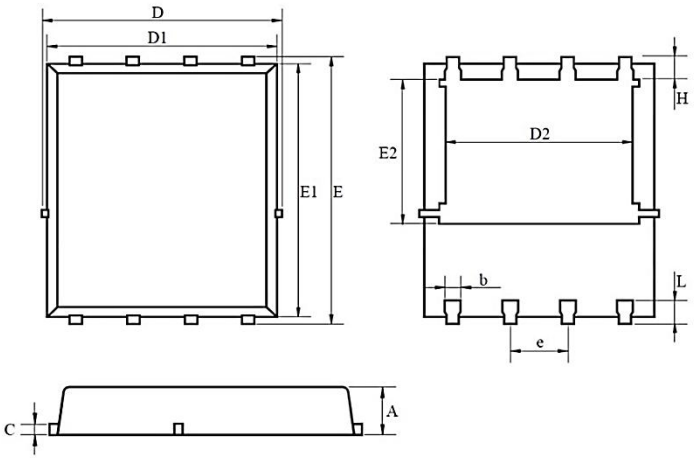
- Case: DFN5×6-8L, Molded Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	T_C=25°C	I_D	-90	A
	T_C=100°C		-60	
Drain Current – Pulsed		I_{DM}	-360	A
Power Dissipation	T_C=25°C	P_D	55	W
Single Pulse Avalanche Energy		E_{AS}	625	mJ
Thermal Resistance Junction to Case		$R_{\theta JC}$	2.3	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	55 to +150	°C

DIMENSIONS

Item	Min. (mm)	Max. (mm)
A	0.900	1.000
b	0.350	0.450
c	0.245 BSC	
D	4.944	5.096
D1	4.824	4.976
D2	3.910	4.110
E	5.974	6.126
E1	5.674	5.826
E2	3.375	3.575
e	1.270 BSC	
L	0.559	0.711
H	0.574	0.726

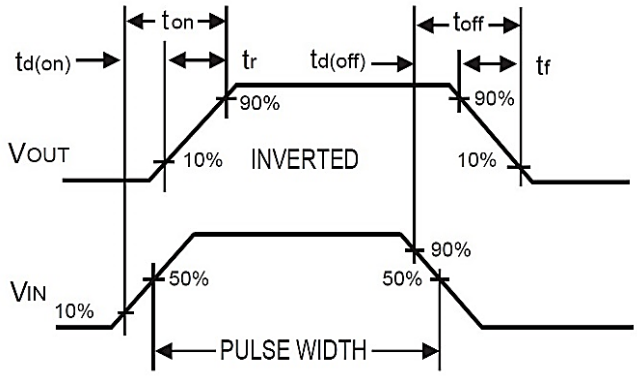


ELECTRICAL CHARACTERISTICS

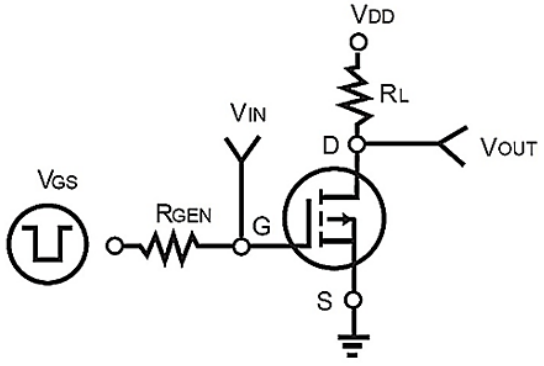
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	-30	--	--	V
Drain-Source Leakage Current	V_{DS}=-24V, V_{GS}=0V	I_{DSS}	--	--	-1	μA
Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	--	--	±100	nA
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-30A	$R_{DS(ON)}$	--	3.3	4.3	mΩ
	V_{GS}=-4.5V, I_D=-20A		--	6.0	8.0	
Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	$V_{GS(th)}$	-1.0	-1.6	-2.5	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=-15V, V_{GS}=-10V, I_D=-20A	Q_g	--	120	--	nC
Gate-Source Charge		Q_{gs}	--	23	--	
Gate-Drain Charge		Q_{gd}	--	17	--	
Turn-On Delay Time	V_{DS}=-15V, V_{GS}=-10V, R_G=3Ω, I_D=-20A	$T_{d(on)}$	--	27	--	nS
Rise Time		T_r	--	83	--	
Turn-Off Delay Time		$T_{d(off)}$	--	76	--	
Fall Time		T_f	--	65	--	
Input Capacitance	V_{DS}=-15V, V_{GS}=0V, F=1MHz	C_{iss}	--	5700	--	pF
Output Capacitance		C_{oss}	--	859	--	
Reverse Transfer Capacitance		C_{rss}	--	650	--	
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Current	--	I_S	--	--	-90	A
Diode Forward Voltage	V_{GS}=0V , I_S=-1A, T_J=25°C	V_{SD}	--	--	-1.2	V
Reverse Recovery Time	I_F=-20A, di/dt=-100A/μs, T_J=25°C	T_{rr}	--	30	--	ns
Reverse Recovery Charge		Q_{rr}	--	18	--	nC

Note:
1. T_A=25°C, unless otherwise noted
2. The E_{AS} test condition is V_{DD} =-15V, V_{GS} =-10V, L =0.5mH, Rg =25Ω.

Switching Time Waveform

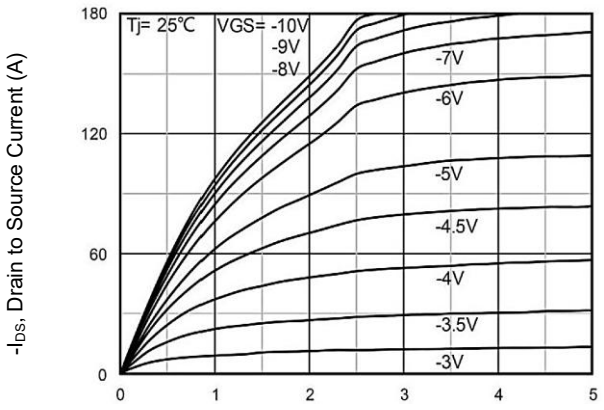


Switching Test Circuit

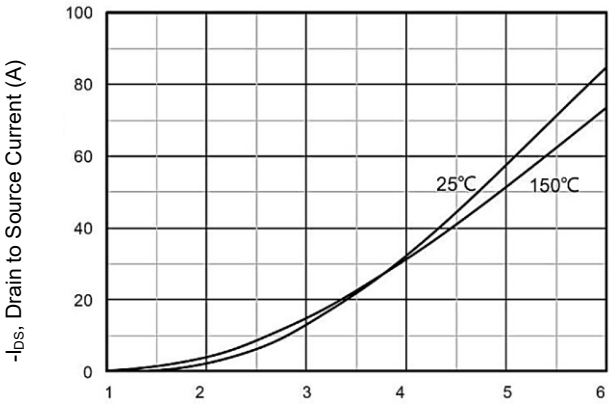


CHARACTERISTIC CURVES

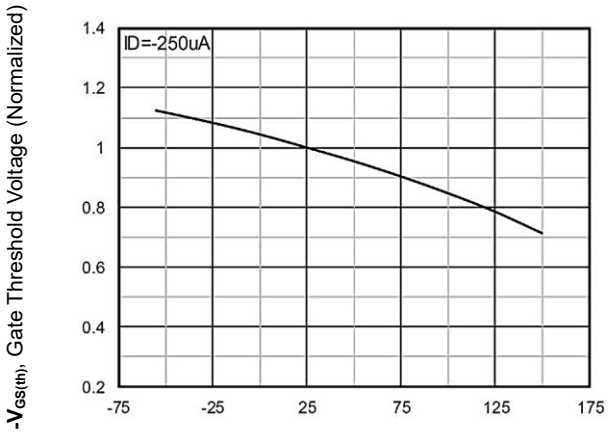
On-Region Characteristics



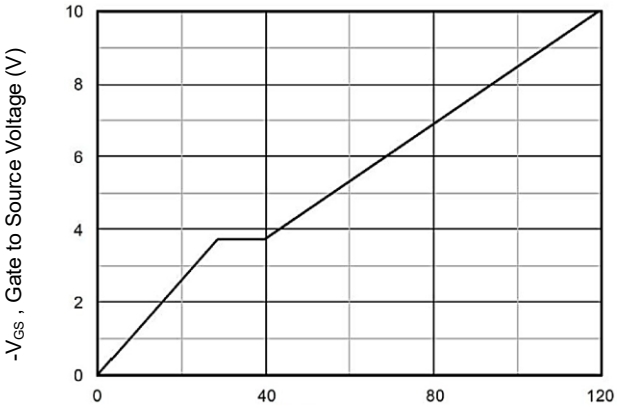
Transfer Characteristics



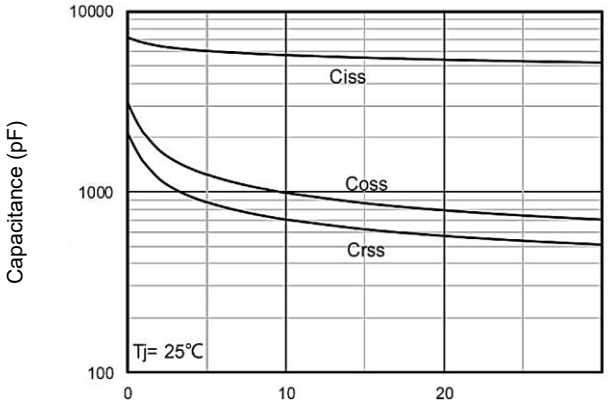
Gate Threshold Voltage vs Temperature



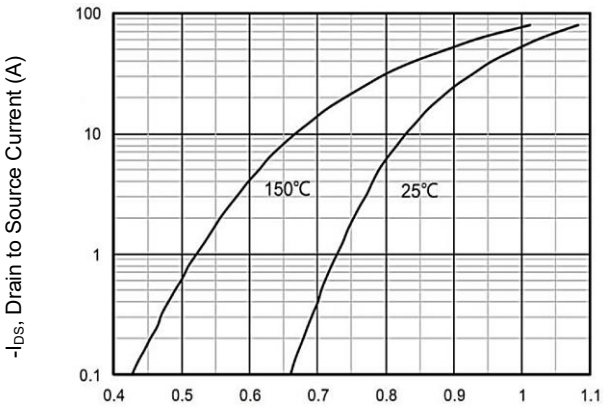
Gate Charge Waveform



Capacitance vs. Drain-Source Voltage

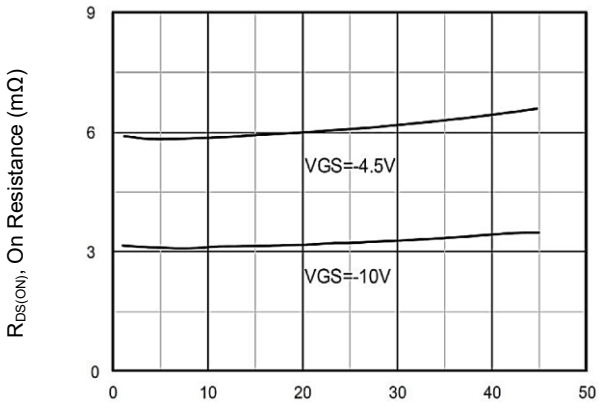


Body Diode Forward Voltage

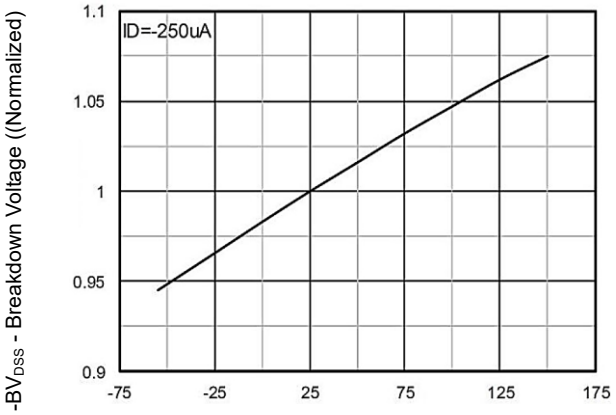


CHARACTERISTIC CURVES

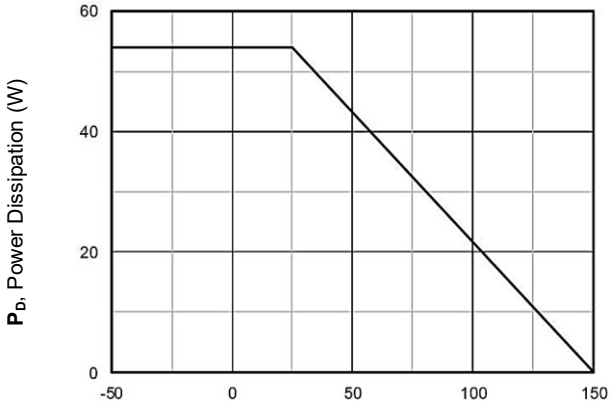
On-Resistance Variation with Drain Current



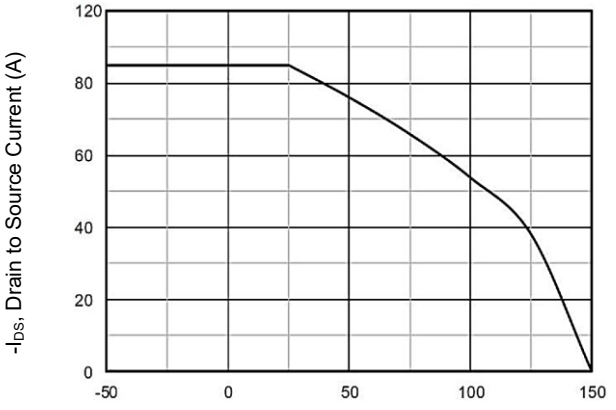
Breakdown Voltage vs Temperature



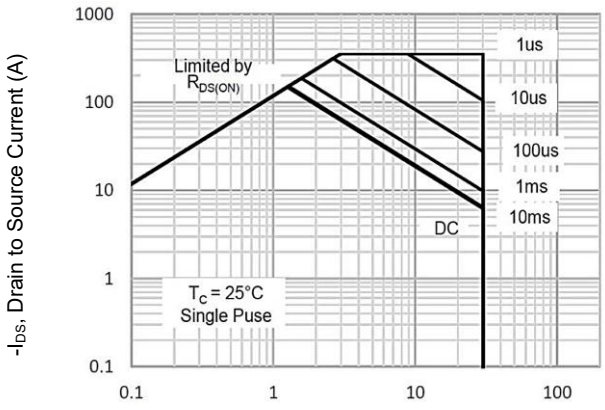
Power Dissipation



Current Dissipation



Maximum Safe Operating Area



Transient Thermal Impedance