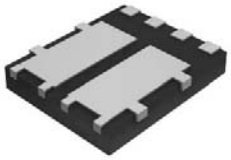
N-Channel MOSFET
100V 28A PPAK5X6

MFT102N28P56

MERITEK

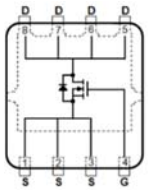
FEATURE

- $R_{DS(ON)}$ <35mΩ, V_{GS}=10V, I_D=5.0A
- $R_{DS(ON)}$ <42mΩ, V_{GS}=7V, I_D=4.0A
- Low On Resistance
- Low Gate Charge



MECHANICAL DATA

- Case: Molded Plastic, PPAK5X6
- Terminal: Solderable per MIL-STD-750, Method 2026



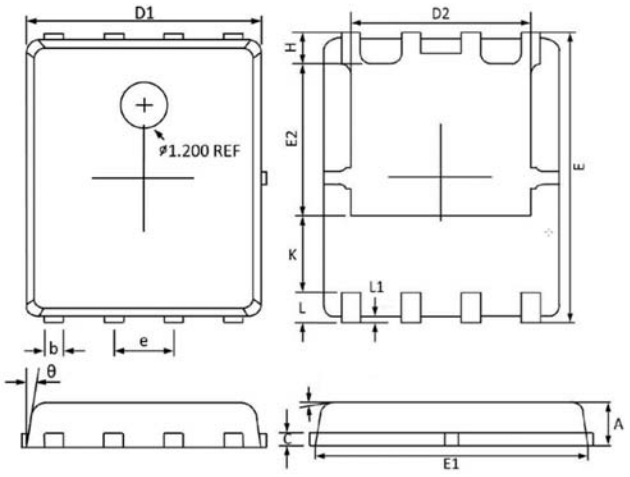
RoHS

MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current – Continuous	V_{GS}=10V, T_C=25°C	I_D	28	A
	V_{GS}=10V, T_C=100°C		18	A
Drain Current – Continuous	V_{GS}=10V, T_A=25°C	I_{DSM}	5	A
	V_{GS}=10V, T_A=70°C		4	A
Drain Current – Pulsed	V_{GS}=10V	I_{DM}	56	A
Avalanche Current	L=0.1mH	I_{AS}	37	A
Avalanche Energy	L=1mH, I_D=15A, V_{DD}=25V	E_{AS}	112	mJ
Repetitive Avalanche Energy		E_{AR}	1.9	mJ
Power Dissipation	T_C=25°C	P_D	56	W
	T_C=100°C		22	W
	T_A=25°C	P_{DSM}	1.7	W
	T_A=70°C		1.1	W
Thermal Resistance Junction to Ambient		$R_{\theta JA}$	72	°C/W
Thermal Resistance Junction to Case		$R_{\theta JC}$	2.2	°C/W
Operating Junction and Storage Temperature Range		T_J, T_{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	1.27 BSC	
H	0.41	0.70
K	1.10	1.50
L	0.51	0.71
θ	0°	12°

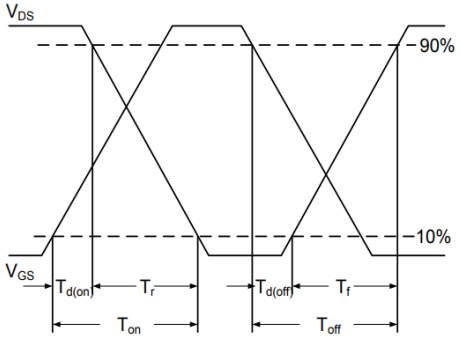


ELECTRICAL CHARACTERISTICS

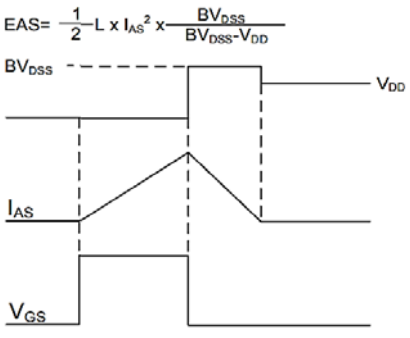
Off Characteristics	Conditions	Symbol	Min	Typ.	Max	Unit
Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	BV_{DSS}	100	--	--	V
Breakdown Voltage Coefficient	I_D=250μA	$\Delta BV_{DSS}/\Delta T_j$	--	0.05	--	V/°C
Drain-Source Leakage Current	V_{DS}=80V, V_{GS}=0V	I_{DSS}	--	--	1	μA
	V_{DS}=80V, V_{GS}=0V, T_J=85°C		--	--	25	μA
Gate-Source Leakage Current	V_{GS}=±20V	I_{GSS}	--	--	±100	nA
Transconductance	V_{DS}=10V, I_D=5A	G_{FS}	--	6.7	--	S
On Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Static Drain-Source On-Resistance	V_{GS}=10V, I_D=5A	$R_{DS(ON)}$	--	25	35	mΩ
	V_{GS}=7V, I_D=4A		--	31	42	mΩ
Gate Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	$V_{GS(th)}$	2	--	4	V
Dynamic Characteristics	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Total Gate Charge	V_{DS}=50V, V_{GS}=10V, I_D=5A	Q_g	13.8	19.7	25.6	nC
Gate-Source Charge		Q_{gs}	1.2	2.4	5	
Gate-Drain Charge		Q_{gd}	5	10.7	15	
Turn-On Delay Time	V_{DS}=50V, V_{GS}=10V, R_G=3Ω, I_D=5A	$T_{d(on)}$	--	11.8	--	ns
Rise Time		T_r	--	26.6	--	
Turn-Off Delay Time		$T_{d(off)}$	--	27.2	--	
Fall Time		T_f	--	15.8	--	
Input Capacitance	V_{DS}=50V, V_{GS}=0V, F=1MHz	C_{iss}	347	496	645	pF
Output Capacitance		C_{oss}	61	87	113	
Reverse Transfer Capacitance		C_{rss}	54	77	100	
Gate Resistance	F=1MHz	R_g	--	2.8	--	Ω
Drain-Source Body Diode	**Conditions**	**Symbol**	**Min**	**Typ.**	**Max**	**Unit**
Diode Forward Current-Continuous	--	I_S	--	--	28	A
Diode Forward Current-Pulsed	--	I_{SM}	--	--	45	A
Diode Forward Voltage	V_{GS}=0V, I_S=1A	V_{SD}	--	0.74	1	V
Reverse Recovery Time	I_F=5A, dI_F/dt=100A/μs	trr	--	29	--	ns
Reverse Recovery Charge		Qrr	--	30	--	nC

Note:
1. The Power Dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for faces where additional heatsinking is used. Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR-4 board with 2 oz. copper, in a still air environment with T_A=25°C. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C.
3. Rating are based on low frequency and low duty cycles to keep initial T_J=25°C
4. When Mounted on 1 in^2 copper pad of FR-4 Board; 125°C/W when mounted on minimum copper pad.

Switching Time Waveform

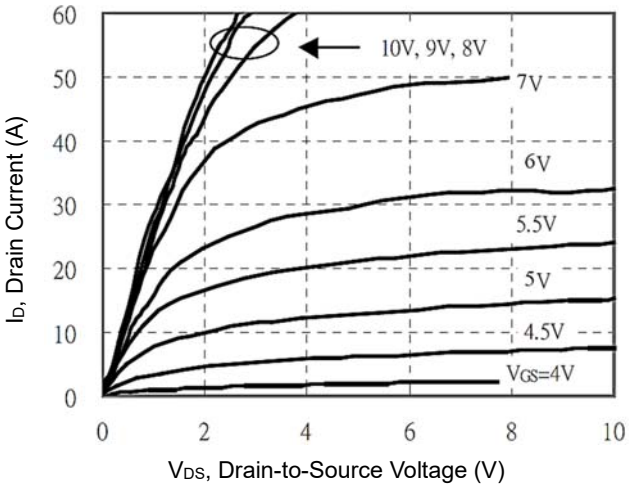


EAS Waveform

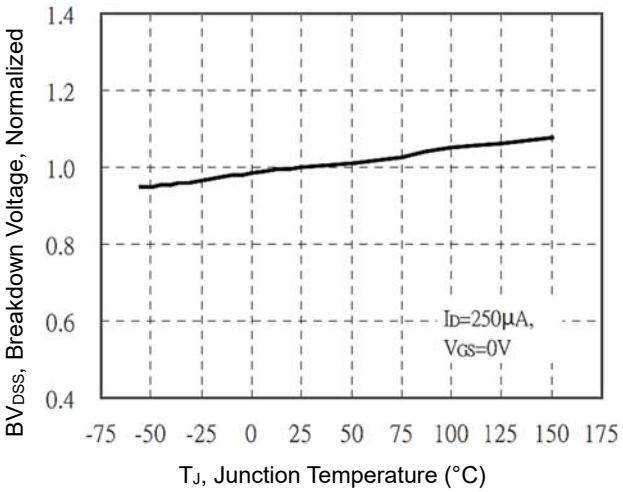


CHARACTERISTICS CURVES

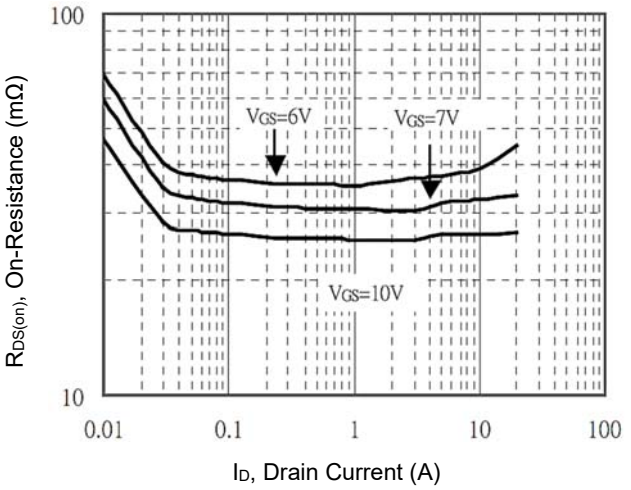
Output Characteristics



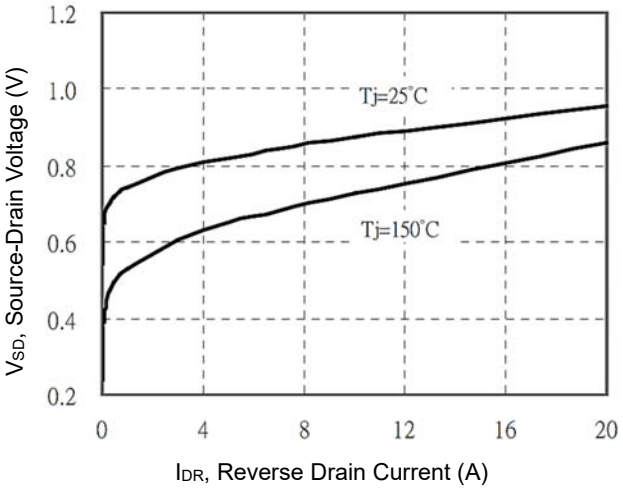
Breakdown Voltage vs Ambient Temperature



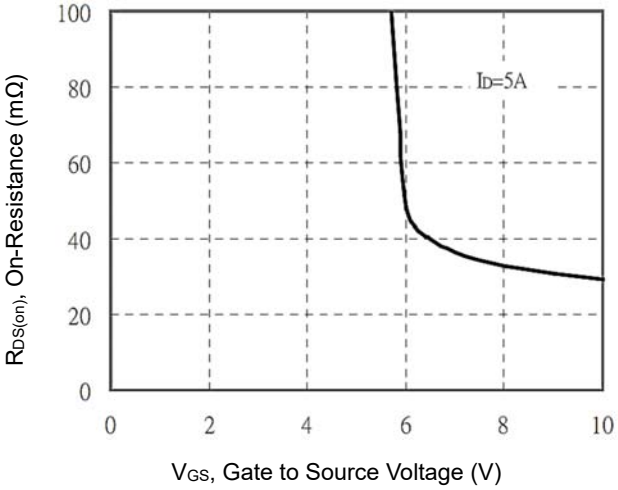
$R_{DS(ON)}$ vs Drain Current



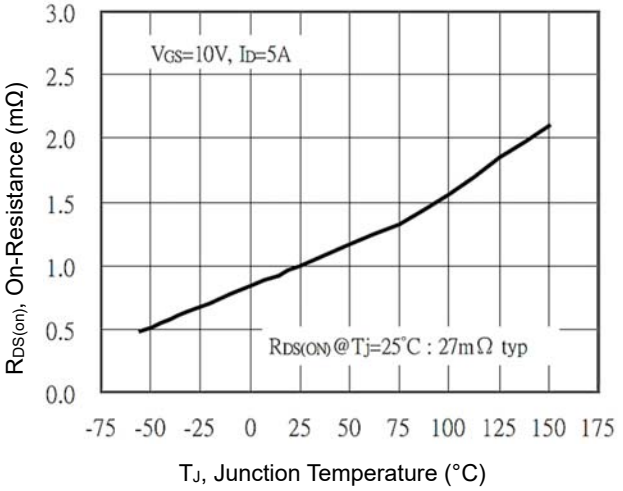
Reverse Drain Current vs Source-Drain Voltage



$R_{DS(ON)}$ vs Gate-Source Voltage

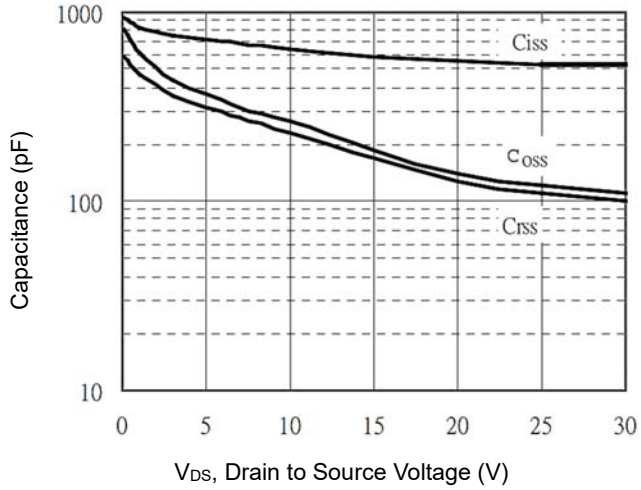


On-Resistance vs. Junction Temperature

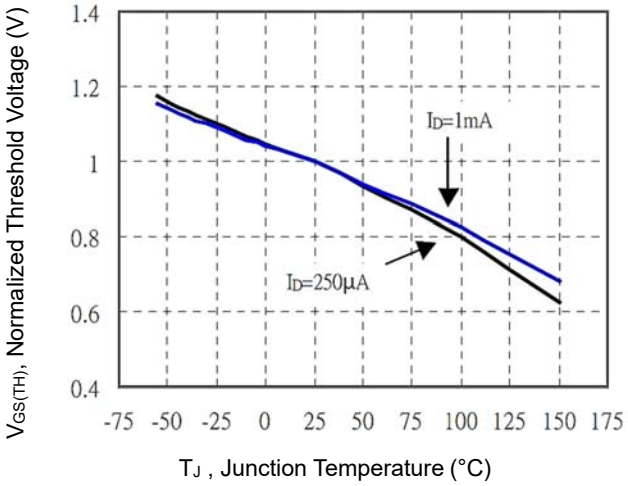


CHARACTERISTICS CURVES

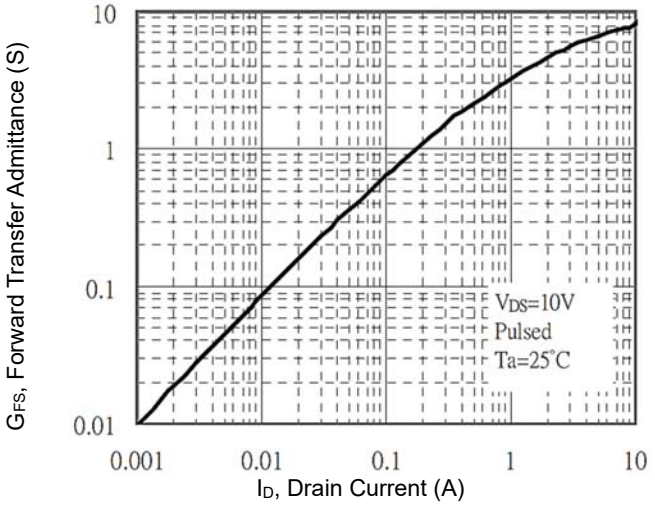
Capacitance vs Drain-Source Voltage



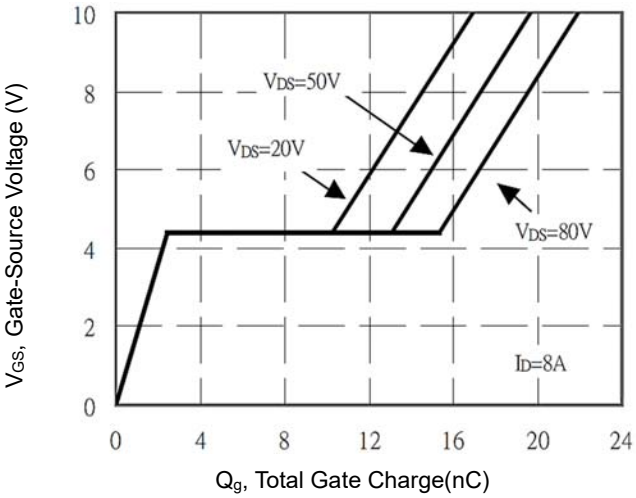
Threshold Voltage vs Junction Temperature



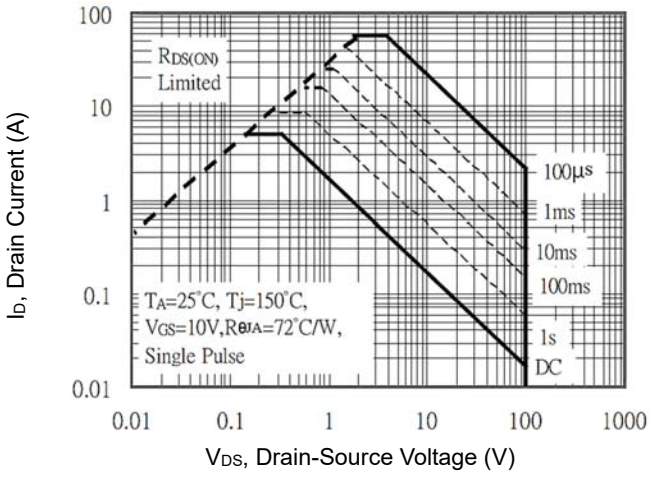
Forward Transfer Admittance vs Drain Current



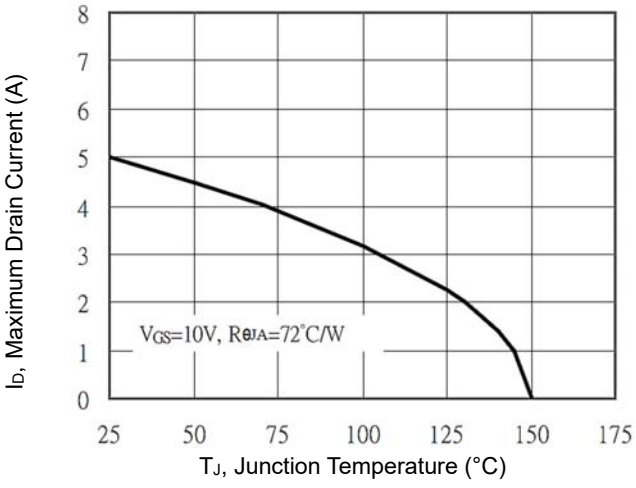
Gate Charge Characteristics



Maximum Safe Operating Area

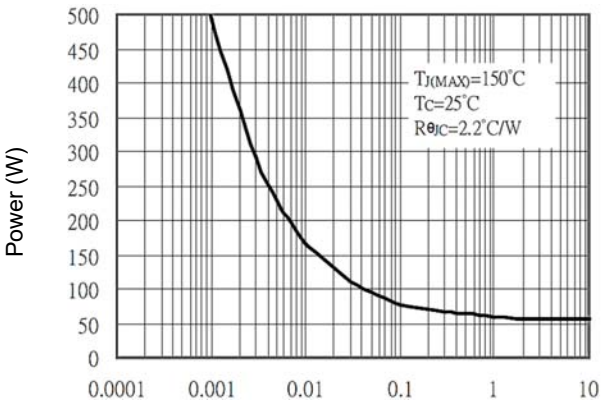


Maximum Drain Current vs Junction Temperature

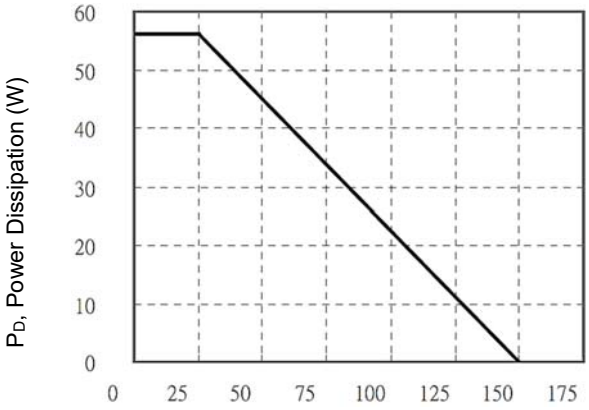


CHARACTERISTICS CURVES

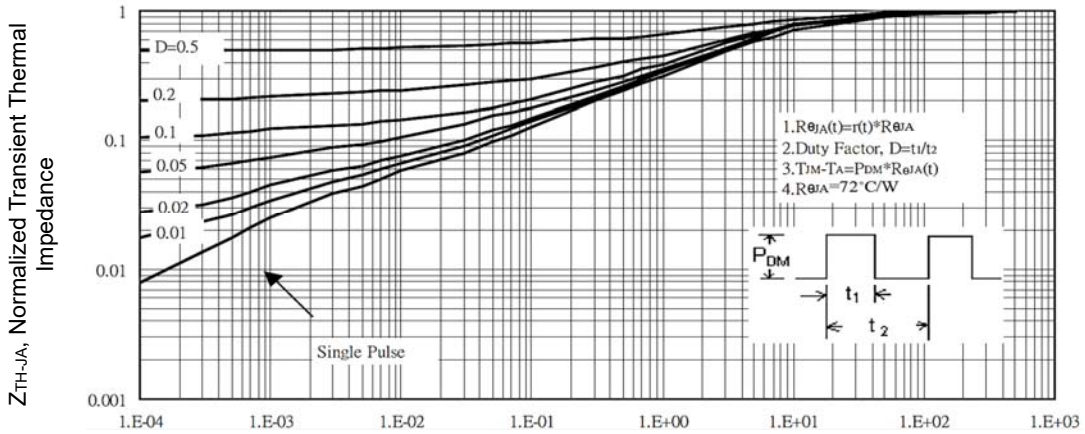
Single Pulse Power Rating, Junction to Ambient



Power Derating Curve



Transient Thermal Response Curves



Transient Thermal Response Curves