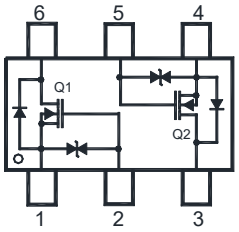
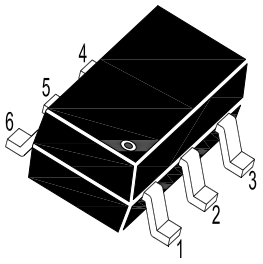
MMFTN2004KDW

Dual N-Channel Enhancement Mode MOSFET

Features

- ESD protected
- Extremely low threshold voltage





Q1: 1. Source 2. Gate 6. Drain
Q2: 4. Source 5. Gate 3. Drain
SOT-363 Plastic Package

Application

- Portable appliances

Absolute Maximum Ratings(T_a = 25℃)

Parameter			Symbol	Value	Unit
Drain-Source Voltage			V_{DS}	20	V
Gate-Source Voltage			V_{GS}	± 10	V
Continuous Drain Current	Steady State	T_a = 25℃ T_a = 85℃	I_D	540 390	mA
Pulsed Drain Current [1)]			I_{DM}	1.5	A
Power Dissipation			P_D	200	mW
Operating and Storage Temperature Range			T_j, T_{stg}	- 55 to + 150	℃

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient [2)]	$R_{\theta JA}$	625	℃/W

[1)] Pulse Test: Pulse Width ≤ 100 μs, Duty Cycle ≤ 2%,Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.

[2)] Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.

Dated: 02/11/2020 Rev: 01

Characteristics at T_a = 25℃ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at I_D = 250 µA	BV_{DSS}	20	-	-	V
Drain-Source Leakage Current at V_{DS} = 16 V	I_{DSS}	-	-	1	µA
Gate Leakage Current at V_{GS} = ± 10 V	I_{GSS}	-	-	± 20	µA
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, I_D = 250 µA	$V_{GS(th)}$	0.35	-	1.1	V
Drain-Source On-State Resistance at V_{GS} = 4.5 V, I_D = 0.5 A at V_{GS} = 2.5 V, I_D = 0.2 A at V_{GS} = 1.8 V, I_D = 0.1 A	$R_{DS(on)}$	- - -	- - -	0.4 0.45 0.8	Ω
DYNAMIC PARAMETERS					
Gate Resistance at V_{GS} = 0 V, V_{DS} = 0 V, f = 1 MHz	R_g	-	112	-	Ω
Input Capacitance at V_{GS} = 0 V, V_{DS} = 10 V, f = 1 MHz	C_{iss}	-	72	-	pF
Output Capacitance at V_{GS} = 0 V, V_{DS} = 10 V, f = 1 MHz	C_{oss}	-	14	-	pF
Reverse Transfer Capacitance at V_{GS} = 0 V, V_{DS} = 10 V, f = 1 MHz	C_{rss}	-	12	-	pF
Gate charge total at V_{DS} = 10 V, I_D = 1 A, V_{GS} = 4.5 V at V_{DS} = 10 V, I_D = 1 A, V_{GS} = 2.5 V	Q_g	- -	1.1 0.6	- -	nC
Gate to Source Charge at V_{DS} = 10 V, I_D = 1 A, V_{GS} = 4.5 V	Q_{gs}	-	0.3	-	nC
Gate to Drain Charge at V_{DS} = 10 V, I_D = 1 A, V_{GS} = 4.5 V	Q_{gd}	-	0.2	-	nC
Turn-On Delay Time at V_{GS} = 4.5 V, V_{DS} = 10 V, I_D = 0.5 A, R_g = 10 Ω	$t_{d(on)}$	-	12	-	nS
Turn-On Rise Time at V_{GS} = 4.5 V, V_{DS} = 10 V, I_D = 0.5 A, R_g = 10 Ω	t_r	-	6	-	nS
Turn-Off Delay Time at V_{GS} = 4.5 V, V_{DS} = 10 V, I_D = 0.5 A, R_g = 10 Ω	$t_{d(off)}$	-	13	-	nS
Turn-Off Fall Time at V_{GS} = 4.5 V, V_{DS} = 10 V, I_D = 0.5 A, R_g = 10 Ω	t_f	-	10	-	nS
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at I_S = 0.5 A, V_{GS} = 0 V	V_{SD}	-	0.8	1.3	V
Body Diode Reverse Recovery Time at I_S = 1 A, di/dt = 100 A / µs	t_{rr}	-	5.2	-	nS
Body Diode Reverse Recovery Charge at I_S = 1 A, di/dt = 100 A / µs	Q_{rr}	-	1.2	-	nC

Electrical Characteristics Curves

Fig. 1 Typical Output Characteristic

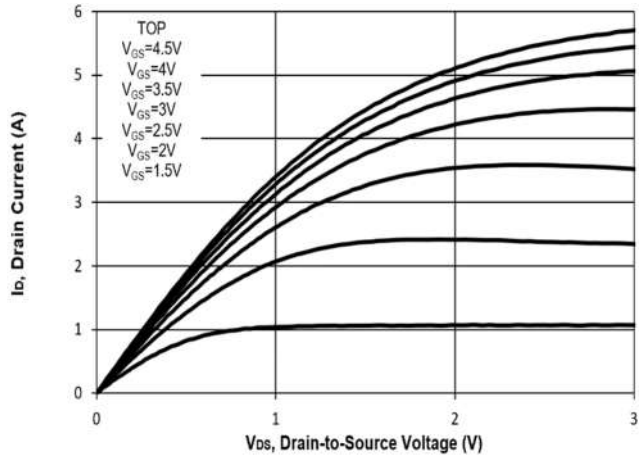


Fig. 2 Typical Transfer Characteristic

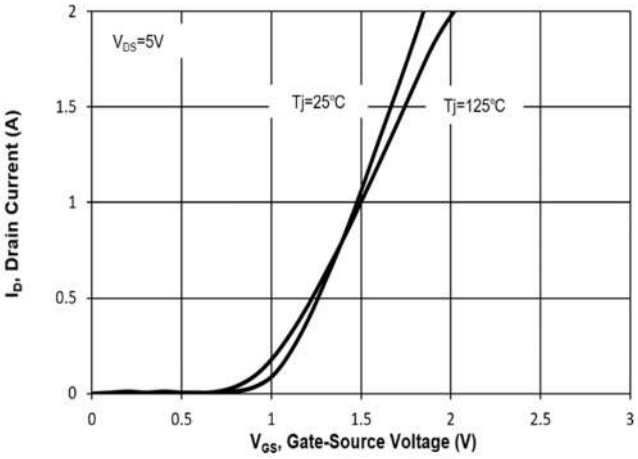


Fig. 3 on-Resistance vs. Drain Current

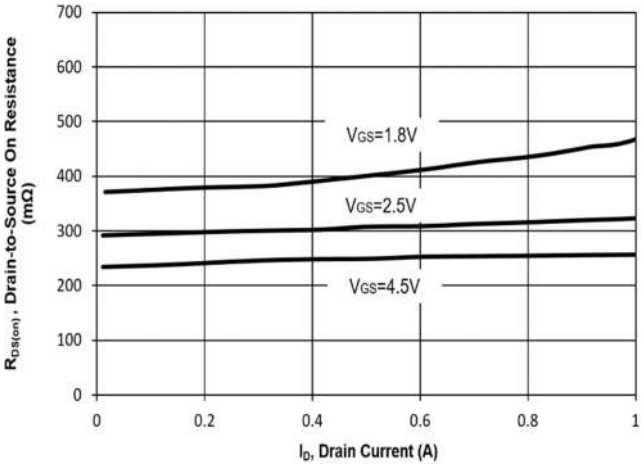


Fig. 4 on-Resistance vs. Gate Voltage

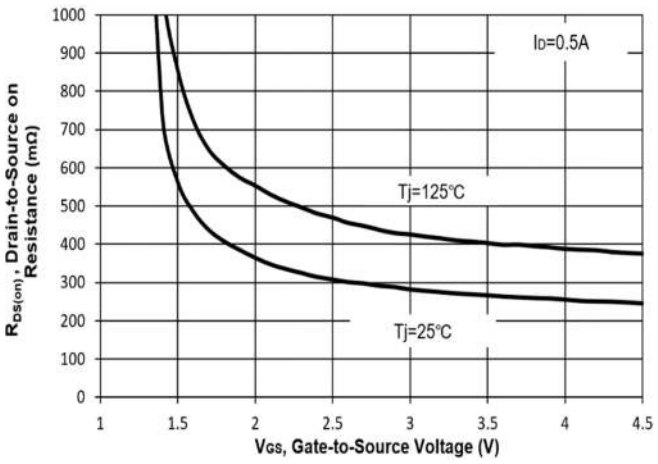


Fig. 5 on-Resistance vs.T_j

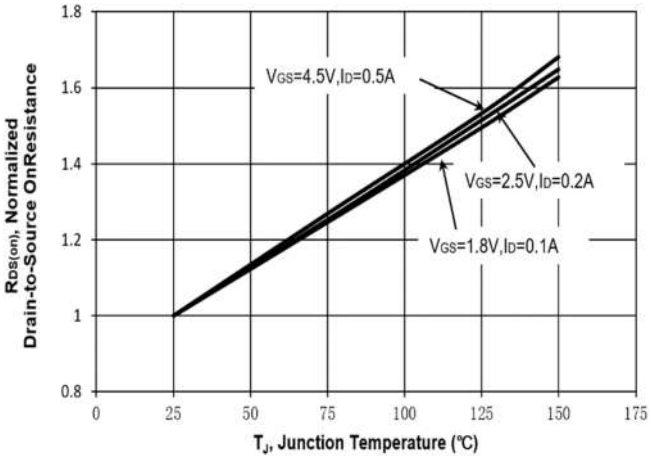
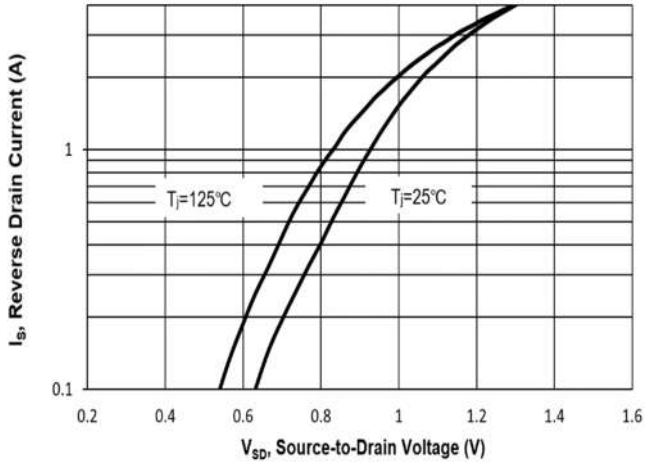


Fig. 6 Typical Forward Characteristic



Electrical Characteristics Curves

Fig. 7 Typical Junction Capacitance

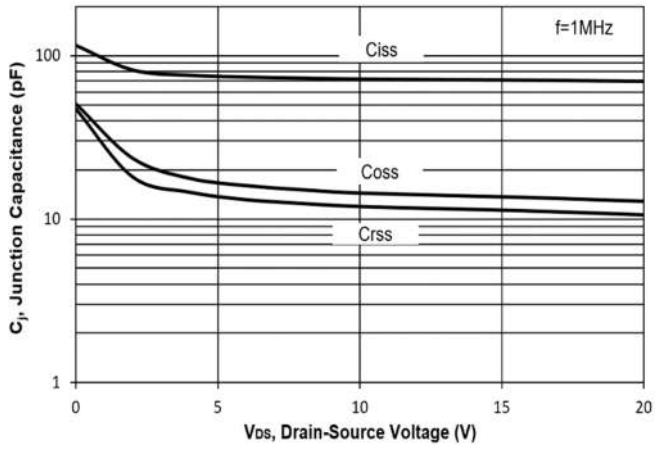


Fig. 8 Drain-Source Leakage Current vs. T_j

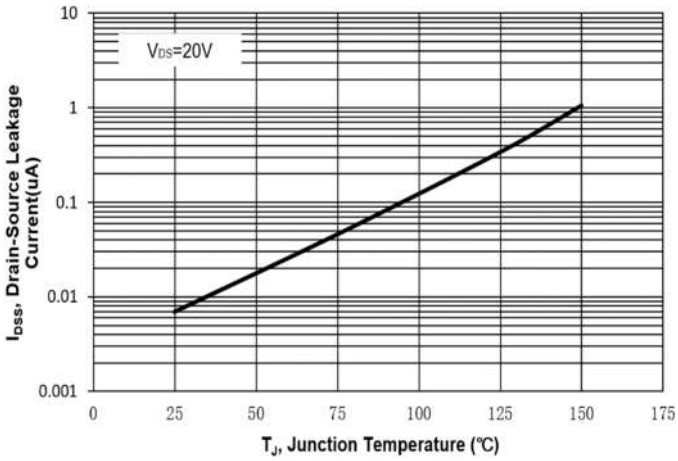


Fig. 9 $V_{(BR)DSS}$ vs. Junction Temperature

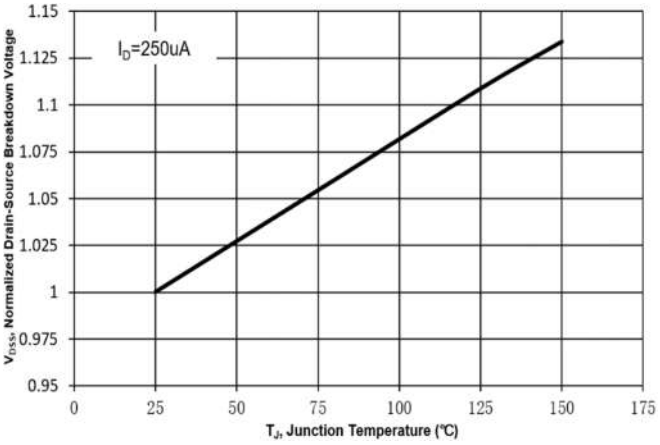


Fig. 10 Gate Threshold Variation vs. T_j

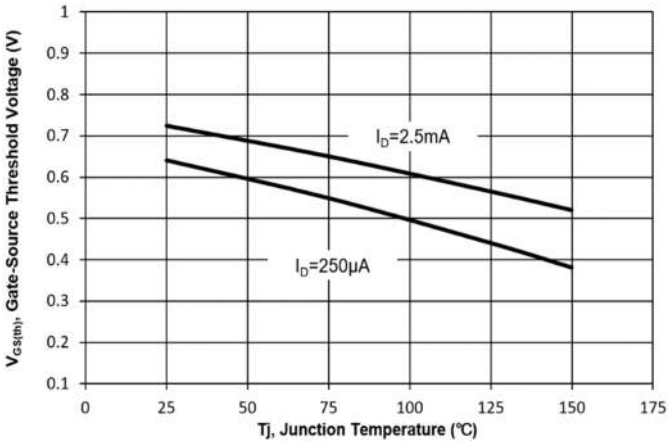
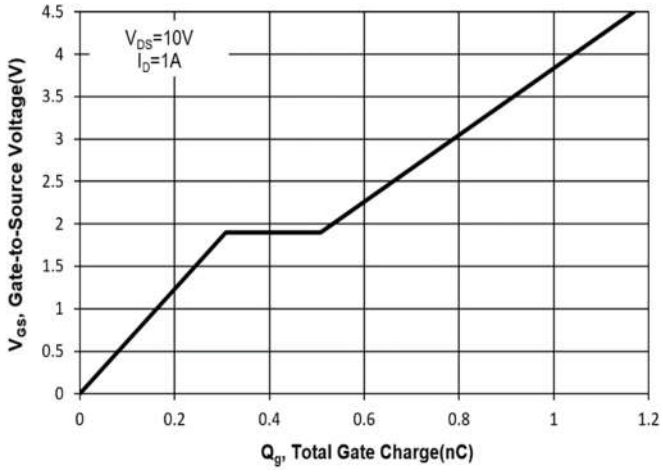
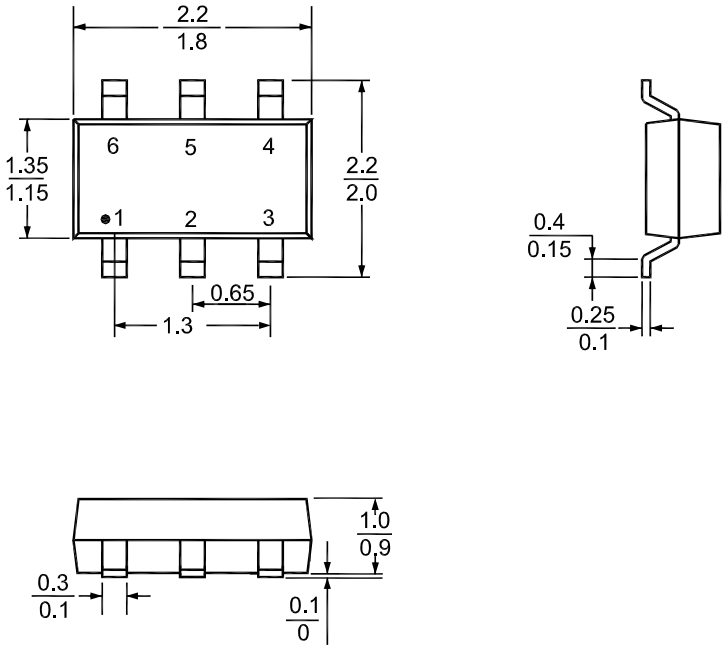


Fig. 11 Gate Charge

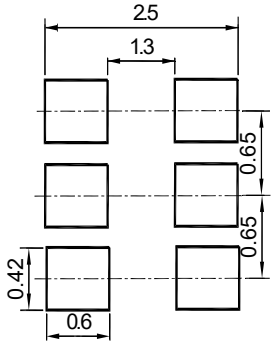


MMFTN2004KDW

Package Outline Dimensions (Units: mm) SOT-363



Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-363	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

" MU " = Part No.
"YM" = Date Code Marking
"Y" = Year
"M" = Month
Font type: Arial