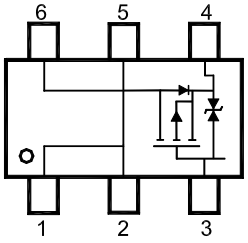
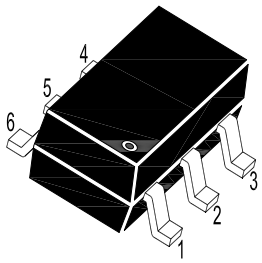
MMFTP6415KD-HAF

P-Channel Enhancement Mode MOSFET

Features

- Surface-mounted package
- Advanced trench cell design
- Halogen and Antimony Free(HAF), RoHS compliant





1. Drain 2. Drain 3. Gate
4. Source 5. Drain 6. Drain
SOT-26 Plastic Package

Applications

- Portable appliances
- Battery management
- High speed switch
- Low power DC to DC Converter

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	T_a = 25℃ T_a = 70℃	$-I_D$	3.3 2.7	A
Peak Drain Current, Pulsed [1]		$-I_{DM}$	17	A
Power Dissipation [2]	T_a = 25℃ T_a = 70℃	P_D	1.25 0.8	W
Operating Junction Temperature Range		T_j	- 55 to + 150	℃
Storage Temperature Range		T_{stg}	- 55 to + 150	℃

Thermal Characteristics

Parameter		Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient	at t ≤ 10 s [2] Steady State	$R_{\theta JA}$	100 140	℃/W

[1] Repetitive rating, pulse width limited by junction temperature.

[2] Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.

Preliminary

Dated: 09/06/2020 P1

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	$-V_{(BR)DSS}$	20	-	-	V
Zero Gate Voltage Drain Current at $-V_{DS}$ = 20 V	$-I_{DSS}$	-	-	1	µA
Gate-Source Leakage at V_{GS} = ± 10 V	I_{GSS}	-	-	± 10	µA
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, $-I_D$ = 250 µA	$-V_{GS(th)}$	0.5	-	1.2	V
Drain-Source On-State Resistance at $-V_{GS}$ = 10 V, $-I_D$ = 3.3 A at $-V_{GS}$ = 4.5 V, $-I_D$ = 2 A at $-V_{GS}$ = 2.5 V, $-I_D$ = 1 A	$R_{DS(on)}$	- - -	- - -	82 100 140	mΩ
DYNAMIC PARAMETERS					
Forward Transconductance at $-V_{DS}$ = 5 V, $-I_D$ = 3.3 A	g_{fs}	-	8.6	-	S
Input Capacitance at $-V_{DS}$ = 10 V, V_{GS} = 0 V, f = 1 MHz	C_{iss}	-	518	-	pF
Output Capacitance at $-V_{DS}$ = 10 V, V_{GS} = 0 V, f = 1 MHz	C_{oss}	-	72	-	pF
Reverse Transfer Capacitance at $-V_{DS}$ = 10 V, V_{GS} = 0 V, f = 1 MHz	C_{rss}	-	67	-	pF
Total Gate Charge at $-V_{DS}$ = 10 V, $-I_D$ = 3 A, $-V_{GS}$ = 10 V	Q_g	-	13	-	nC
Gate Source Charge at $-V_{DS}$ = 10 V, $-I_D$ = 3 A, $-V_{GS}$ = 10 V	Q_{gs}	-	1.7	-	nC
Gate Drain Charge at $-V_{DS}$ = 10 V, $-I_D$ = 3 A, $-V_{GS}$ = 10 V	Q_{gd}	-	1.2	-	nC
Turn-On Delay Time at $-V_{DD}$ = 10 V, $-V_{GS}$ = 10 V, $-I_D$ = 3 A, R_G = 4.5 Ω, R_L = 3.3 Ω	$t_{d(on)}$	-	2.6	-	ns
Turn-On Rise Time at $-V_{DD}$ = 10 V, $-V_{GS}$ = 10 V, $-I_D$ = 3 A, R_G = 4.5 Ω, R_L = 3.3 Ω	t_r	-	34	-	ns
Turn-Off Delay Time at $-V_{DD}$ = 10 V, $-V_{GS}$ = 10 V, $-I_D$ = 3 A, R_G = 4.5 Ω, R_L = 3.3 Ω	$t_{d(off)}$	-	193	-	ns
Turn-Off Fall Time at $-V_{DD}$ = 10 V, $-V_{GS}$ = 10 V, $-I_D$ = 3 A, R_G = 4.5 Ω, R_L = 3.3 Ω	t_f	-	86	-	ns
Body-Diode PARAMETERS					
Body Diode Voltage at $-I_S$ = 1 A	$-V_{SD}$	-	-	1.3	V
Body Diode Reverse Recovery Time at $-I_F$ = 3 A , di/dt = 100 A / µs	t_{rr}	-	38	-	ns
Body Diode Reverse Recovery Charge at $-I_F$ = 3 A , di/dt = 100 A / µs	Q_{rr}	-	8.8	-	nC

Electrical Characteristics Curves

Fig. 1 Output Characteristic

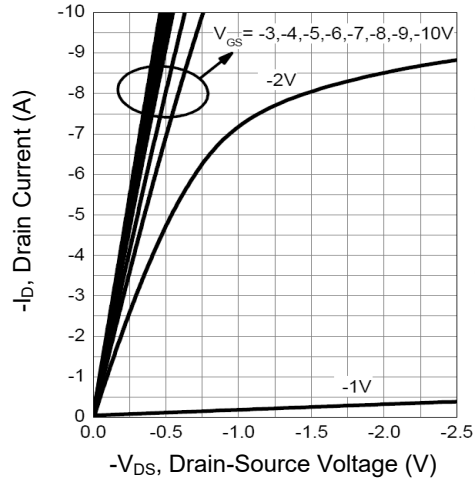


Fig. 2 Transfer Characteristics

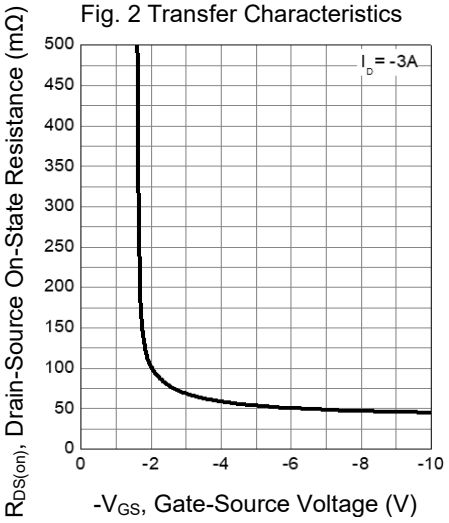


Fig. 3 on-Resistance vs. Drain Current

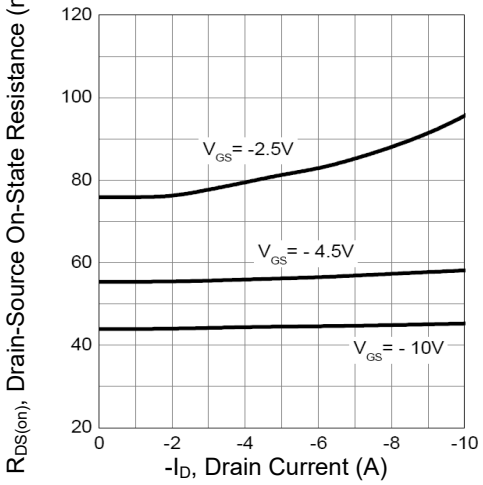


Fig. 4 V_{GSTH} vs T_j

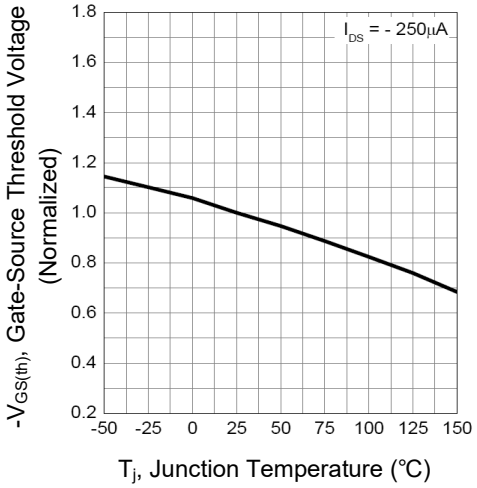


Fig. 5 $R_{DS(on)}$ vs. T_j

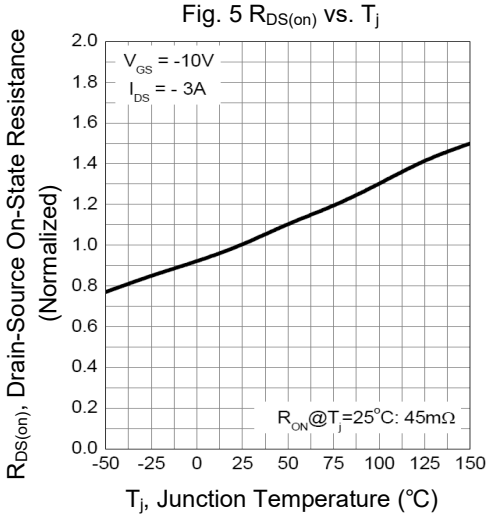
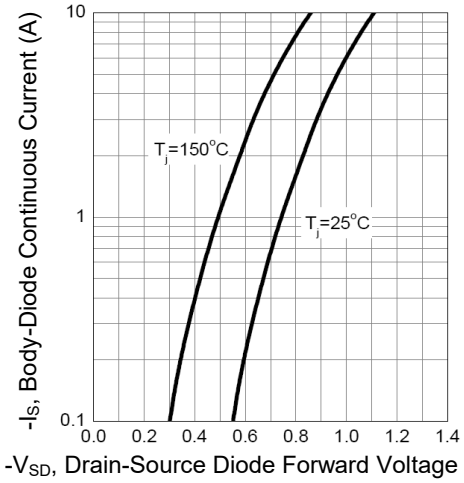


Fig. 6 Diode Forward



Preliminary

Dated: 09/06/2020 P1

Electrical Characteristics Curves

Fig. 7 Capacitance

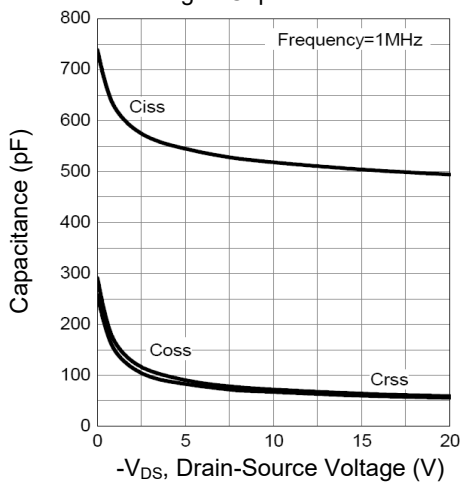
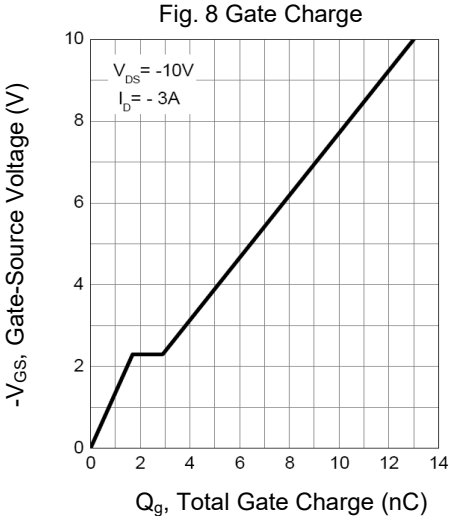


Fig. 8 Gate Charge



Test Circuits

Fig.1-1 Switching times test circuit

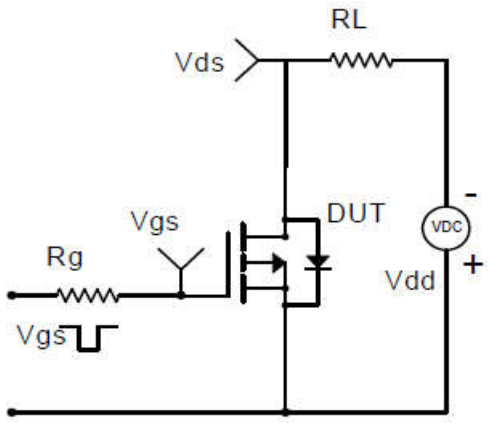


Fig.1-2 Switching Waveform

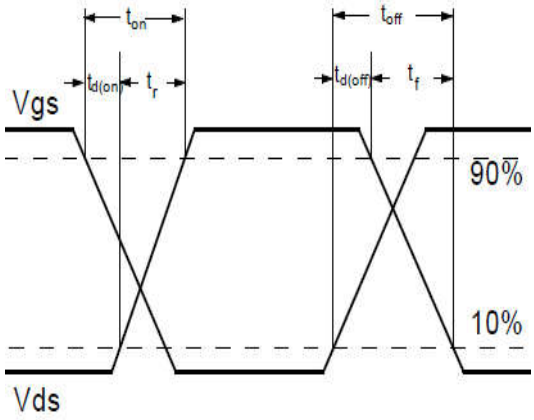


Fig.2-1 Gate charge test circuit

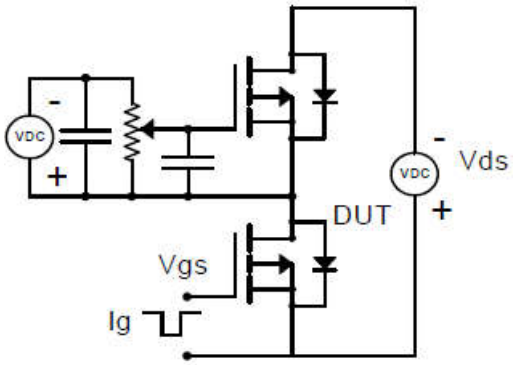
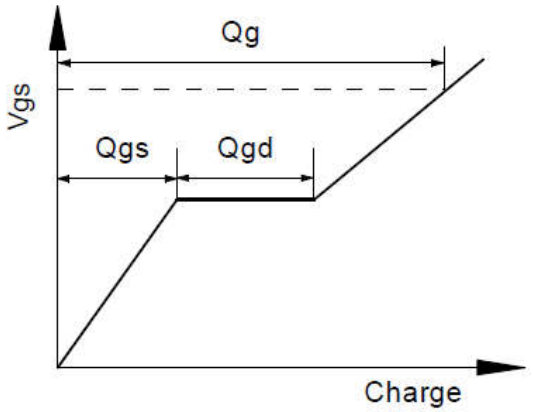
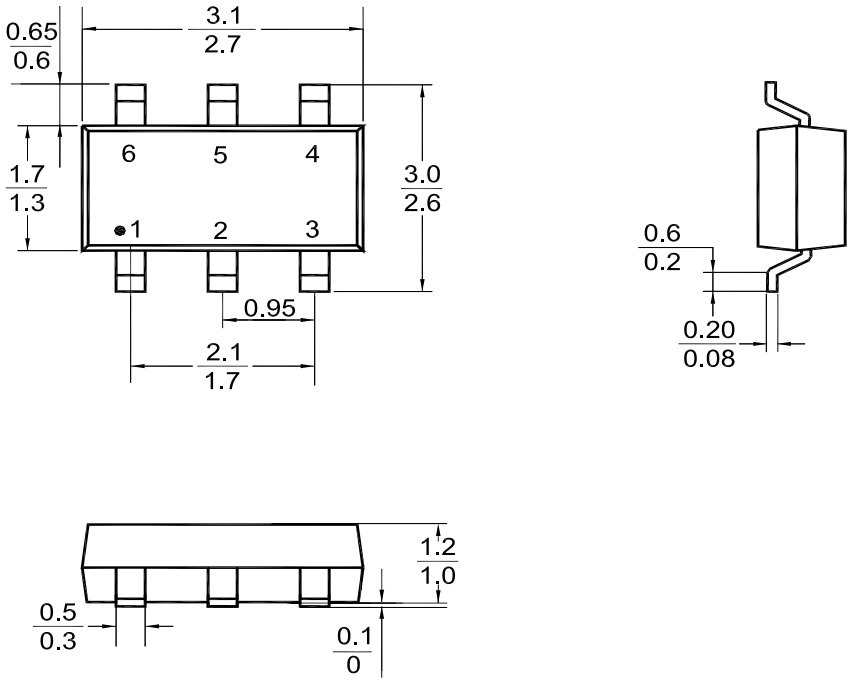


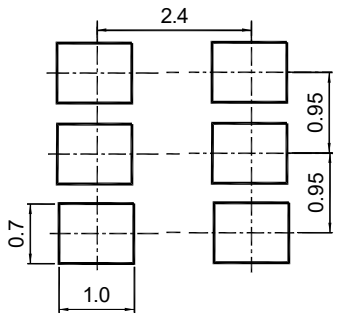
Fig.2-2 Gate charge waveform



Package Outline Dimensions (Units: mm) SOT-26



Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-26	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Marking information

" MN " = Part No.
" • " = HAF (Halogen and Antimony Free)
"YM" = Date Code Marking
"Y" = Year
"M" = Month
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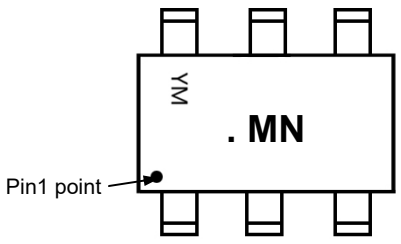

Preliminary
Dated: 09/06/2020 P1