

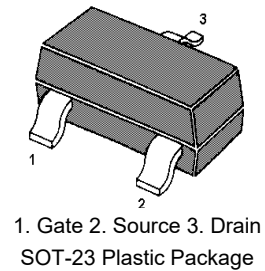
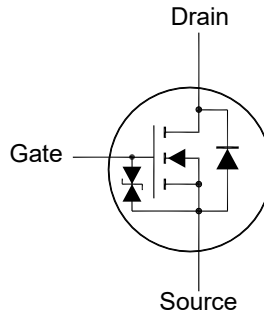
# MMFTN3434K

## N-Channel Enhancement Mode MOSFET

### Features

- Typical ESD Protection HBM Class 1B

Classification	Voltage Range(V)
0A	< 125
0B	125 to < 250
1A	250 to < 500
1B	500 to < 1000
1C	1000 to < 2000
2	2000 to < 4000
3A	4000 to < 8000
3B	≥ 8000



### Applications

- Portable appliances
- Battery management

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

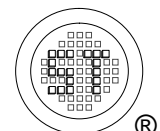
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	4.2	A
Peak Drain Current, Pulsed <sup>1)</sup>	$I_{DM}$	30	A
Power Dissipation	$P_D$	1.4	W
Operating Junction Temperature Range	$T_j$	- 55 to + 150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	- 55 to + 150	$^\circ\text{C}$

### Thermal Resistance Ratings

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient <sup>2)</sup> $t \leq 10$ s	$R_{\theta JA}$	90	$^\circ\text{C/W}$
Thermal Resistance from Junction to Ambient <sup>2)</sup> Steady State	$R_{\theta JA}$	125	$^\circ\text{C/W}$

<sup>1)</sup> Pulse Test: Pulse Width  $\leq 100 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ , Repetitive rating, pulse width limited by junction temperature  $T_{j(\text{MAX})}=150^\circ\text{C}$ .

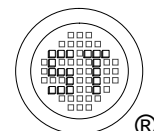
<sup>3)</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.



# MMFTN3434K

## Characteristics at $T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>					
Drain-Source Breakdown Voltage at $I_D = 250 \mu\text{A}$	$V_{(BR)DSS}$	30	-	-	V
Drain-Source Leakage Current at $V_{DS} = 30 \text{ V}$	$I_{DSS}$	-	-	1	$\mu\text{A}$
Gate-Source Leakage Current at $V_{GS} = \pm 20 \text{ V}$	$I_{GSS}$	-	-	$\pm 10$	$\mu\text{A}$
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$ , $I_D = 250 \mu\text{A}$	$V_{GS(th)}$	1	-	1.8	V
Drain-Source On-State Resistance at $V_{GS} = 4.5 \text{ V}$ , $I_D = 2 \text{ A}$ at $V_{GS} = 10 \text{ V}$ , $I_D = 4.2 \text{ A}$	$R_{DS(on)}$	-	-	75 52	m $\Omega$
<b>DYNAMIC PARAMETERS</b>					
Input Capacitance at $V_{DS} = 20 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{iss}$	-	701	-	pF
Output Capacitance at $V_{DS} = 20 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{oss}$	-	53	-	pF
Reverse Transfer Capacitance at $V_{DS} = 20 \text{ V}$ , $V_{GS} = 0 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{rss}$	-	47	-	pF
Total Gate Charge at $V_{DS} = 15 \text{ V}$ , $I_D = 4.2 \text{ A}$ , $V_{GS} = 10 \text{ V}$	$Q_g$	-	14	-	nC
Gate Source Charge at $V_{DS} = 15 \text{ V}$ , $I_D = 4.2 \text{ A}$ , $V_{GS} = 10 \text{ V}$	$Q_{gs}$	-	2.9	-	nC
Gate Drain Charge at $V_{DS} = 15 \text{ V}$ , $I_D = 4.2 \text{ A}$ , $V_{GS} = 10 \text{ V}$	$Q_{gd}$	-	1.8	-	nC
Turn-On Delay Time at $V_{DD} = 15 \text{ V}$ , $I_D = 4.2 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_{GEN} = 4.5 \Omega$	$t_{d(on)}$	-	4.1	-	ns
Turn-On Rise Time at $V_{DD} = 15 \text{ V}$ , $I_D = 4.2 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_{GEN} = 4.5 \Omega$	$t_r$	-	15	-	ns
Turn-Off Delay Time at $V_{DD} = 15 \text{ V}$ , $I_D = 4.2 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_{GEN} = 4.5 \Omega$	$t_{d(off)}$	-	24	-	ns
Turn-Off Fall Time at $V_{DD} = 15 \text{ V}$ , $I_D = 4.2 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_{GEN} = 4.5 \Omega$	$t_f$	-	16	-	ns
<b>Body-Diode PARAMETERS</b>					
Body Diode Voltage at $I_S = 1 \text{ A}$	$V_{SD}$	-	-	1	V
Body Diode Reverse Recovery Time at $I_S = 4.2 \text{ A}$ , $di/dt = 100 \text{ A} / \mu\text{s}$	$t_{rr}$	-	6.9	-	nS
Body Diode Reverse Recovery Charge at $I_S = 4.2 \text{ A}$ , $di/dt = 100 \text{ A} / \mu\text{s}$	$Q_{rr}$	-	3.5	-	nC



# MMFTN3434K

## Electrical Characteristics Curves

Fig. 1 Output Characteristic

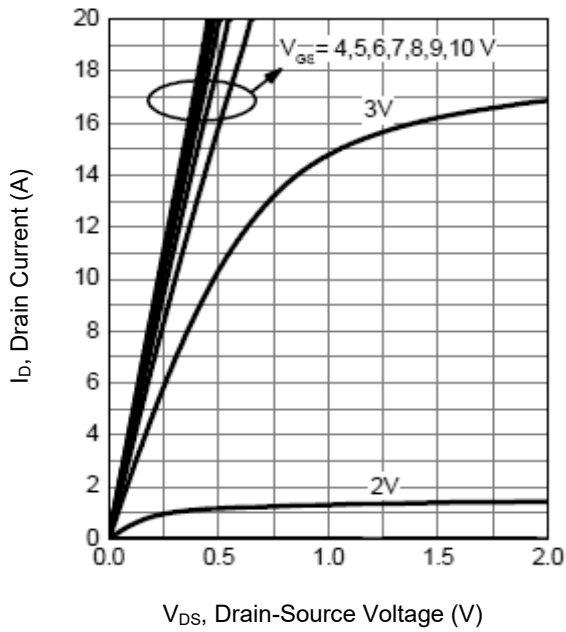


Fig. 2 Transfer Characteristics

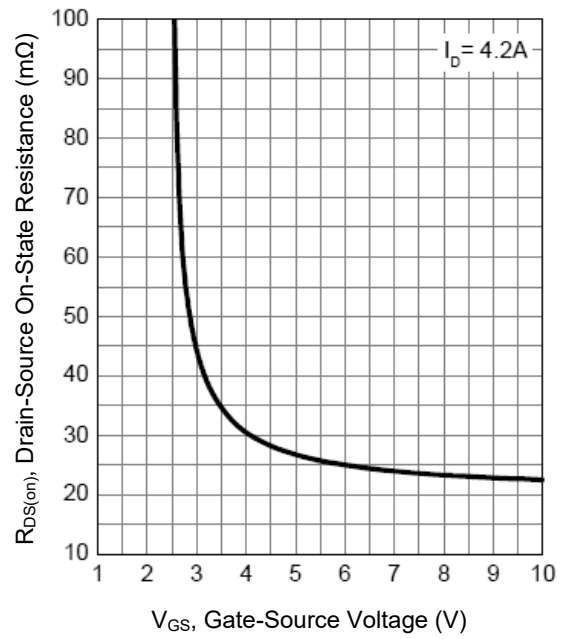


Fig. 3 On-Resistance vs. Drain Current

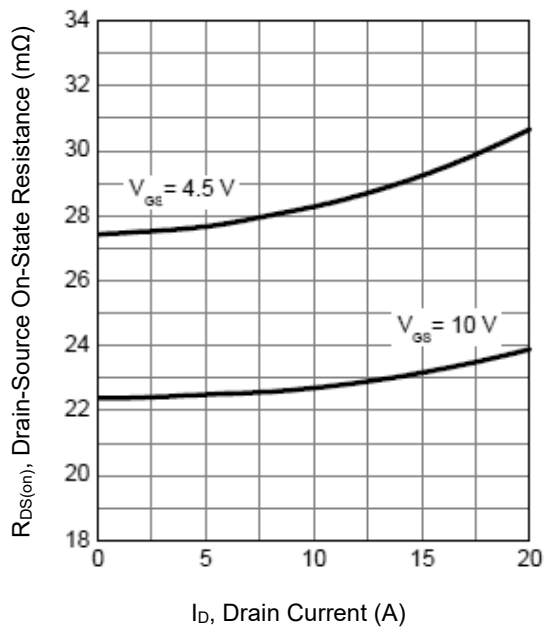
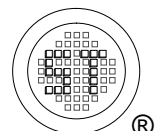
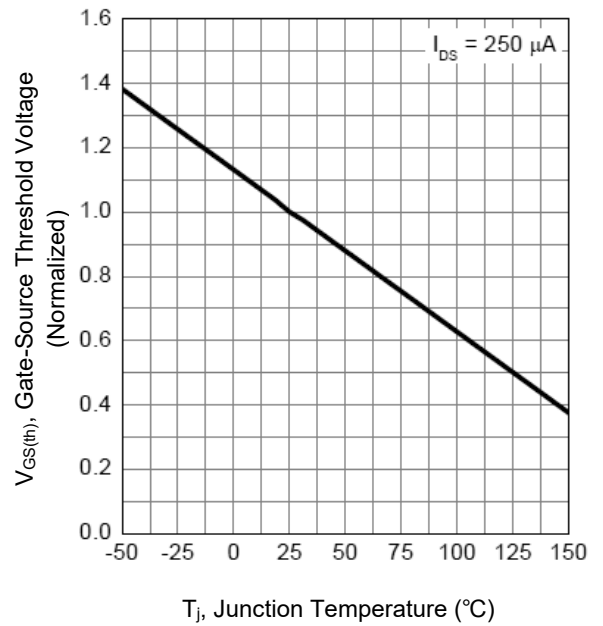


Fig. 4 Gate-Source Threshold Voltage vs.  $T_j$



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## Electrical Characteristics Curves

Fig. 5 On-Resistance vs. Junction Temperature

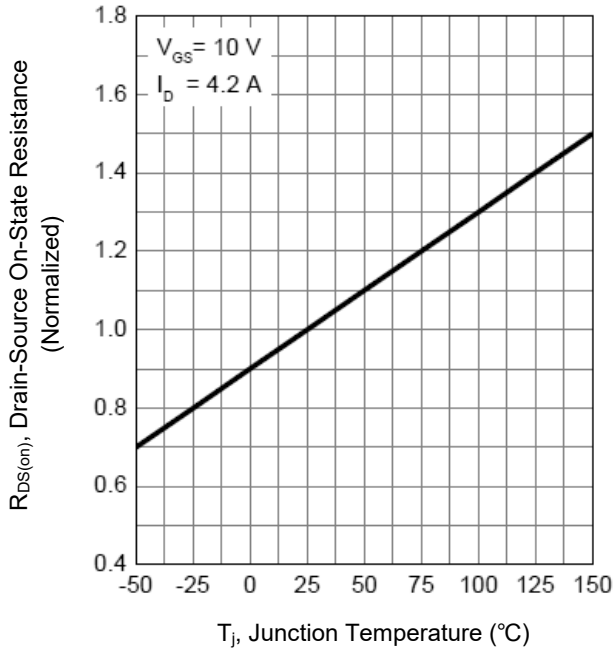


Fig. 6 Typical Forward Characteristics

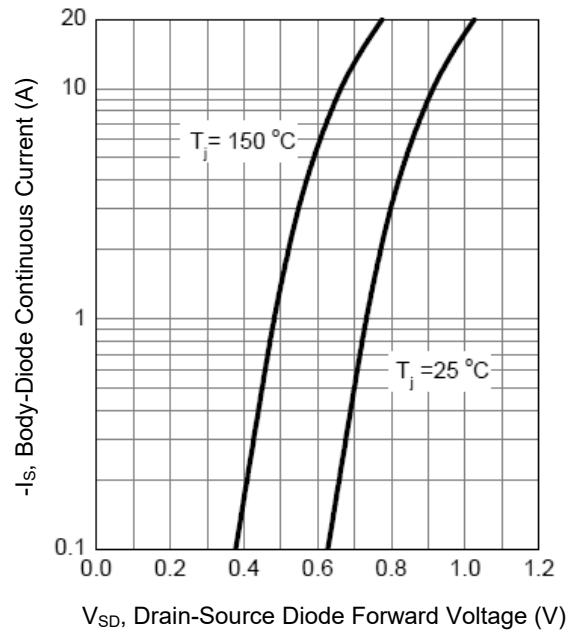


Fig. 7 Capacitance Characteristic

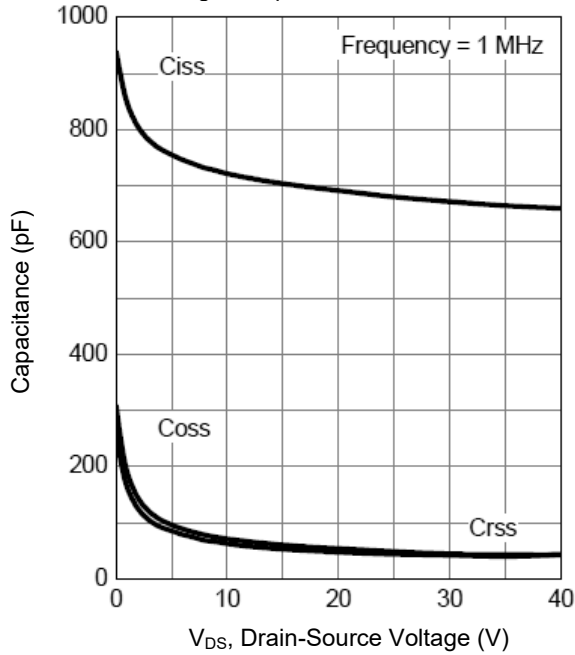
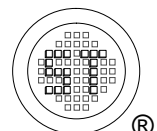
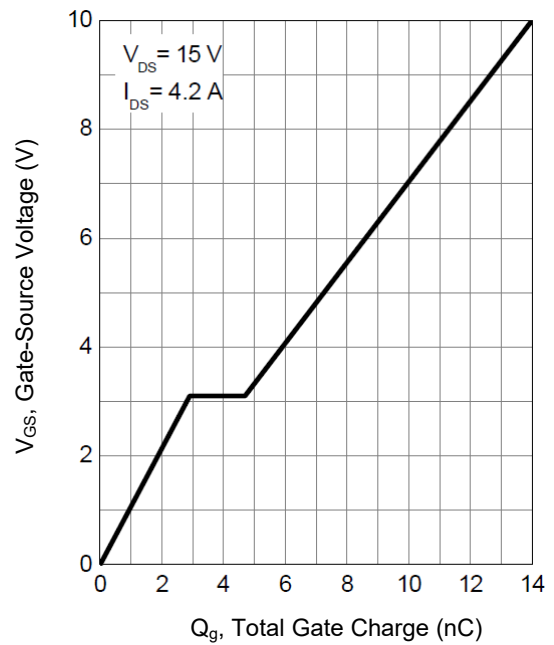


Fig. 8 Gate Charge



## Test Circuits

Fig.1-1 Switching times test circuit

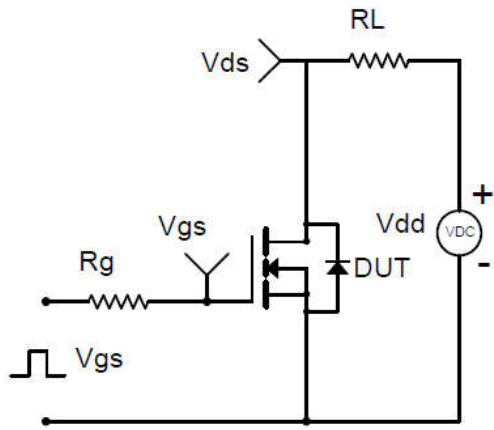


Fig.1-2 Switching Waveform

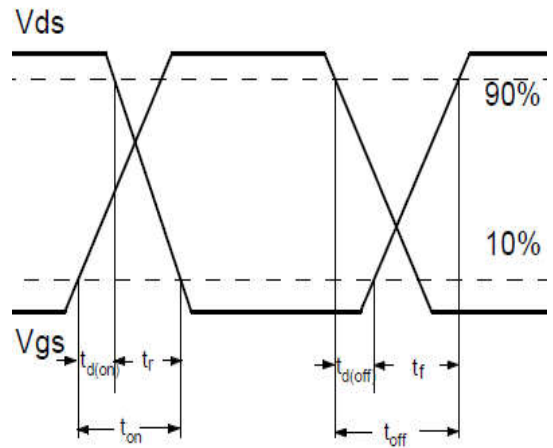


Fig.2-1 Gate charge test circuit

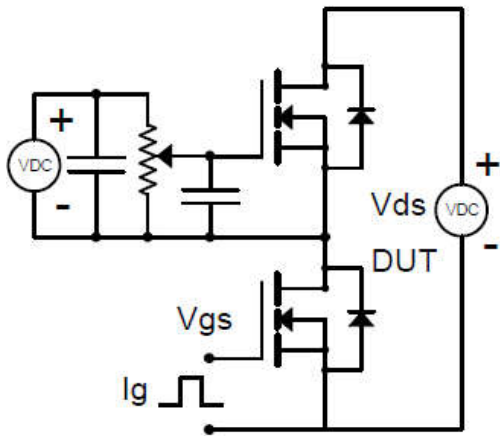
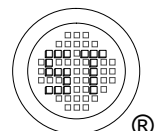
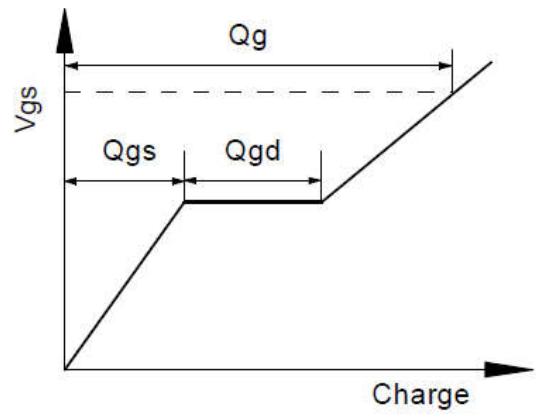


Fig.2-2 Gate charge waveform

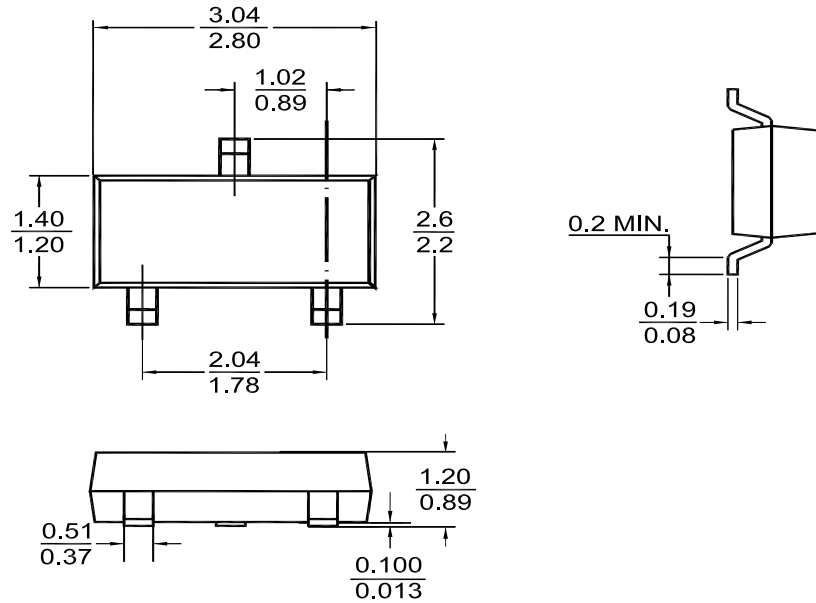


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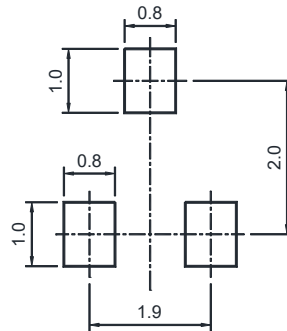
## PACKAGE OUTLINE

Plastic surface mounted package (Dimensions in mm)

SOT-23



### Recommended Soldering Footprint



### Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

### Marking information

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

