

$V_{DSS}$	-30V
$R_{DS(on)}(Max.)$	1.4Ω
$I_D$	±0.2A
$P_D$	0.2W

### ●Features

- 1) Low on-resistance.
- 2) 4V drive.
- 3) Lead Free/RoHS Compliant.

### ●Application

Switching

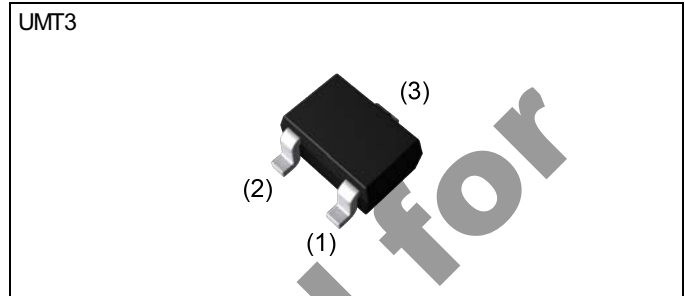
### ●Absolute maximum ratings ( $T_a = 25^{\circ}C$ )

Parameter	Symbol	Value	Unit
Drain - Source voltage	$V_{DSS}$	-30	V
Continuous drain current	$I_D$	±0.2	A
Pulsed drain current	$I_{D,pulse}^{*1}$	±0.4	A
Gate - Source voltage	$V_{GSS}$	±20	V
Power dissipation	$P_D^{*2}$	0.2	W
Junction temperature	$T_j$	150	°C
Range of storage temperature	$T_{stg}$	-55 to +150	°C

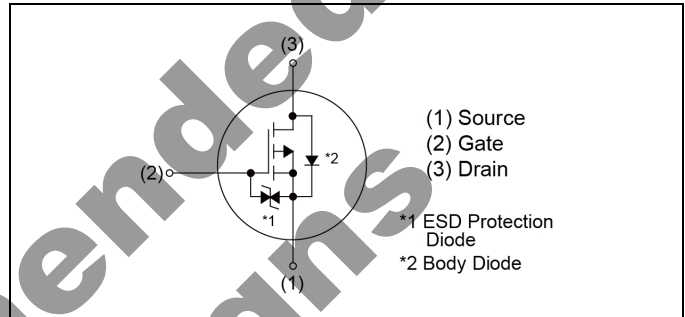
### ●Thermal resistance

Parameter	Symbol	Value	Unit
junction - ambient	$R_{th(ch-a)}^{*2}$	625	°C/W

### ●Outline



### ●Inner circuit



### ●Packaging specifications

Type	Packing	Embossed Tape
	Reel size (mm)	180
	Tape width (mm)	8
	Basic ordering unit (pcs)	3000
	Taping code	T106
	Marking	WP

**●Electrical characteristics (T<sub>a</sub> = 25°C)**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain - Source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -1mA	-30	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V	-	-	-1	μA
Gate - Source leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V	-	-	±10	μA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -1mA	-1.0	-	-2.5	V
Static drain - source on - state resistance	R <sub>DS(on)</sub> <sup>*3</sup>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -0.2A	-	0.9	1.4	Ω
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -0.15A	-	1.4	2.1	
		V <sub>GS</sub> = -4.0V, I <sub>D</sub> = -0.15A	-	1.6	2.4	
Transconductance	g <sub>fs</sub> <sup>*3</sup>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -0.15A	0.2	-	-	S
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V	-	30	-	pF
Output capacitance	C <sub>oss</sub>	V <sub>DS</sub> = -10V	-	4	-	
Reverse transfer capacitance	C <sub>rss</sub>	f = 1MHz	-	5	-	
Turn - on delay time	t <sub>d(on)</sub> <sup>*3</sup>	V <sub>DD</sub> = -15V, V <sub>GS</sub> = -10V	-	8	-	ns
Rise time	t <sub>r</sub> <sup>*3</sup>	I <sub>D</sub> = 0.15A	-	5	-	
Turn - off delay time	t <sub>d(off)</sub> <sup>*3</sup>	R <sub>L</sub> = 100Ω	-	30	-	
Fall time	t <sub>f</sub> <sup>*3</sup>	R <sub>G</sub> = 10Ω	-	40	-	

**●Body diode electrical characteristics (Source-Drain) (T<sub>a</sub> = 25°C)**

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	V <sub>SD</sub> <sup>*3</sup>	V <sub>GS</sub> = 0V, I <sub>S</sub> = -0.1A	-	-	-1.2	V

\*1 P<sub>w</sub> ≤ 10μs, Duty cycle ≤ 1%

\*2 Each terminal mounted on a recommended land

\*3 Pulsed

● Electrical characteristic curves

Fig.1 Typical Capacitance vs. Drain - Source Voltage

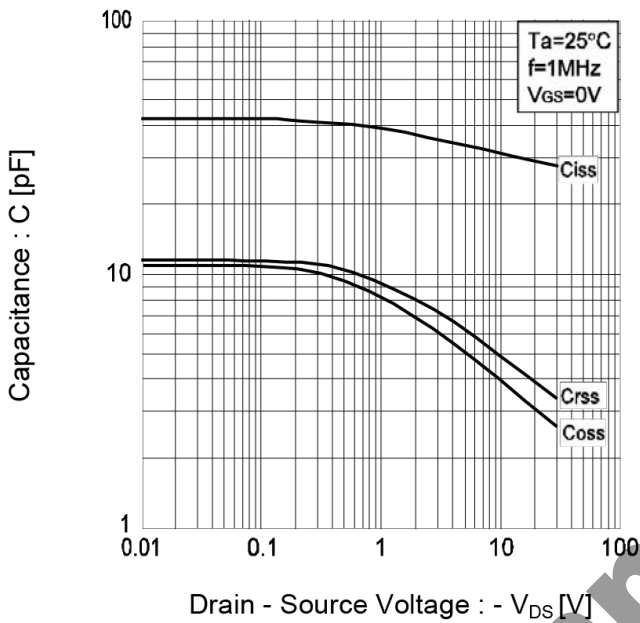


Fig.2 Switching Characteristics

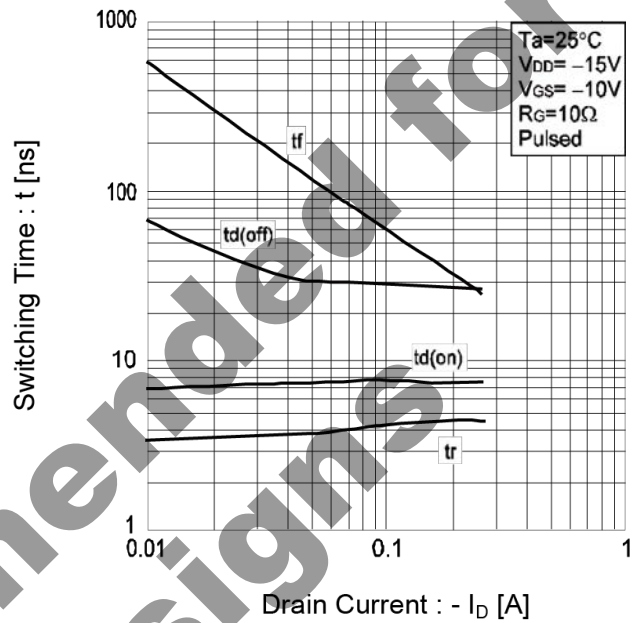


Fig.3 Dynamic Input Characteristics

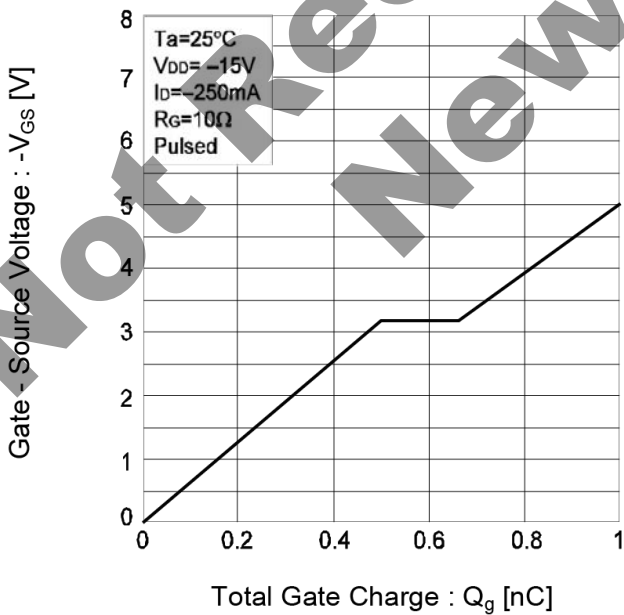
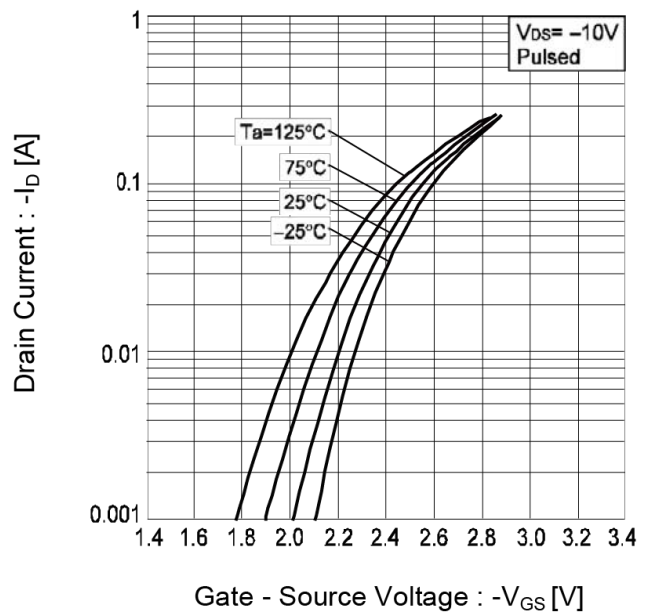


Fig.4 Typical Transfer Characteristics



● Electrical characteristic curves

Fig.5 Static Drain - Source On - State Resistance vs. Gate Source Voltage

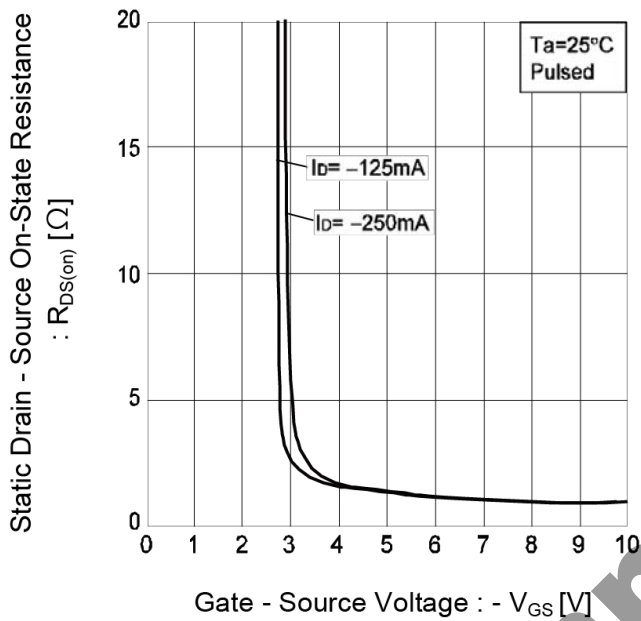


Fig.6 Reverse Drain Current vs. Source- Drain Voltage

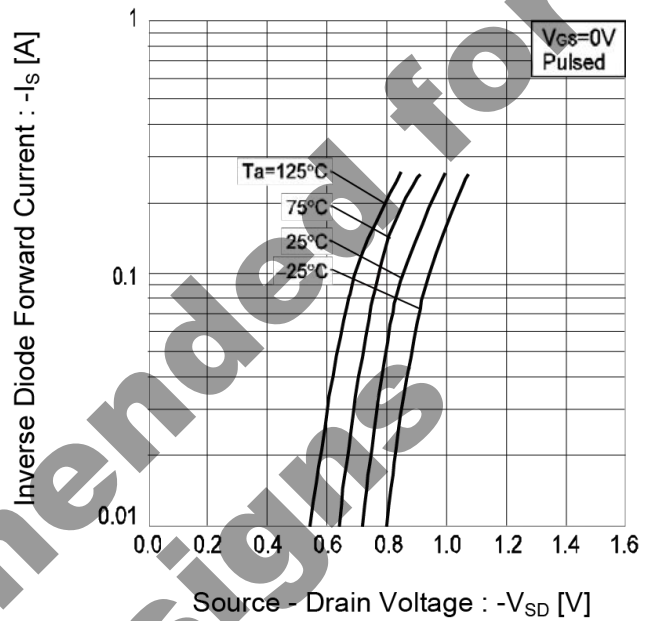


Fig.7 Static Drain - Source On - State Resistance vs. Drain Current (I)

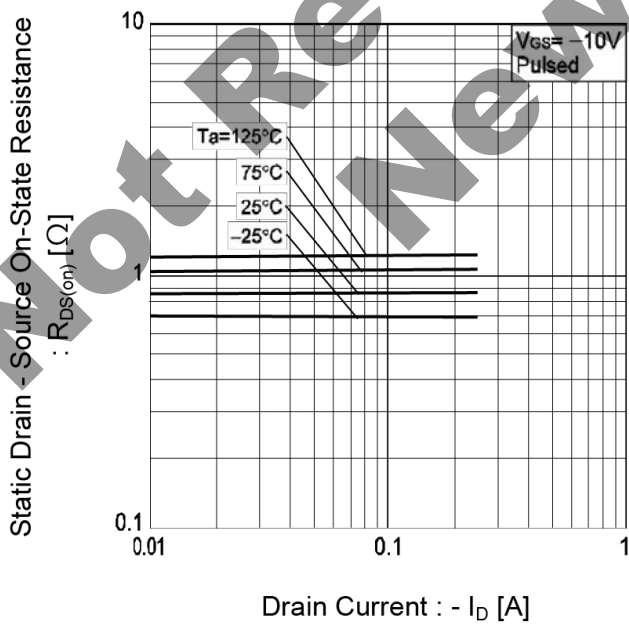
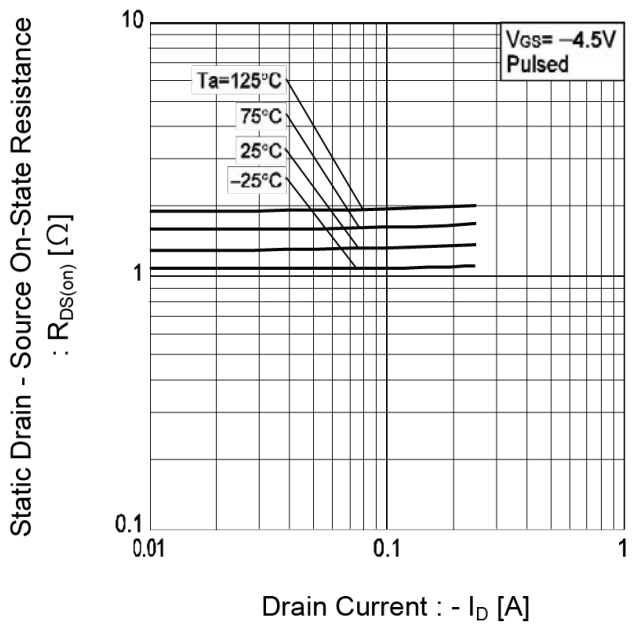


Fig.8 Static Drain - Source On - State Resistance vs. Drain Current (II)



● Electrical characteristic curves

Fig.9 Static Drain - Source On - State Resistance vs. Drain Current (III)

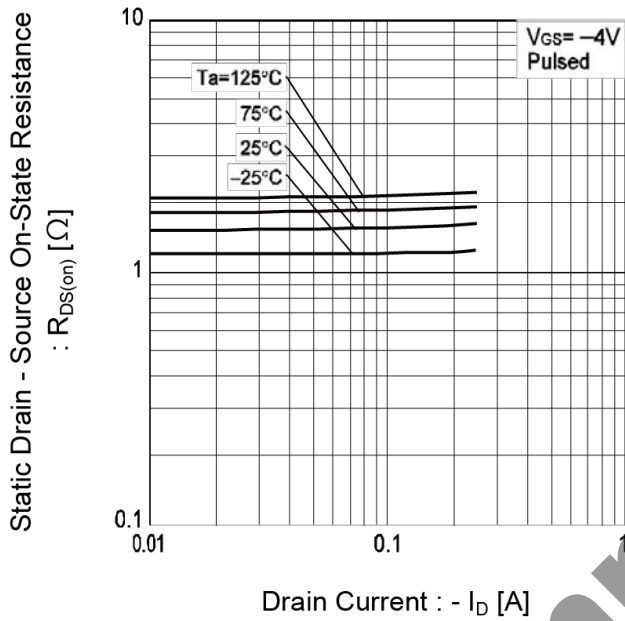
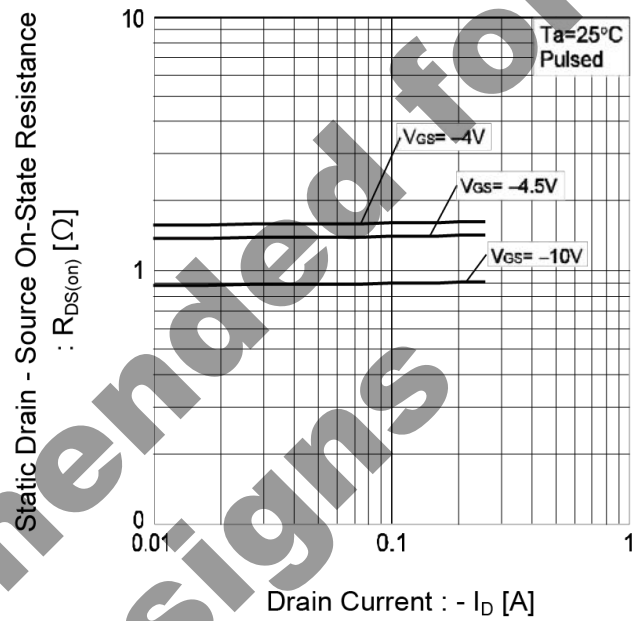


Fig.10 Static Drain - Source On - State Resistance vs. Drain Current (IV)



Not Recommended for New Designs

● Measurement circuits

Fig.1-1 Switching Time Measurement Circuit

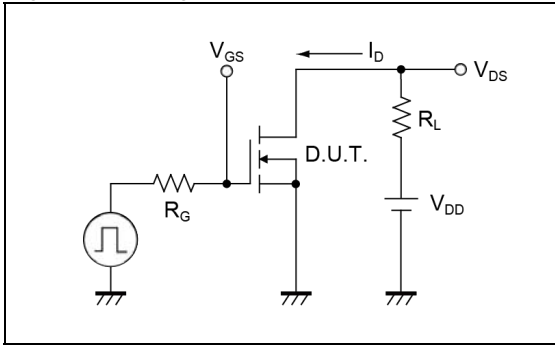
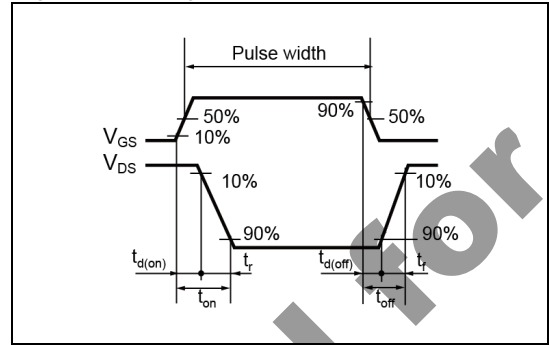


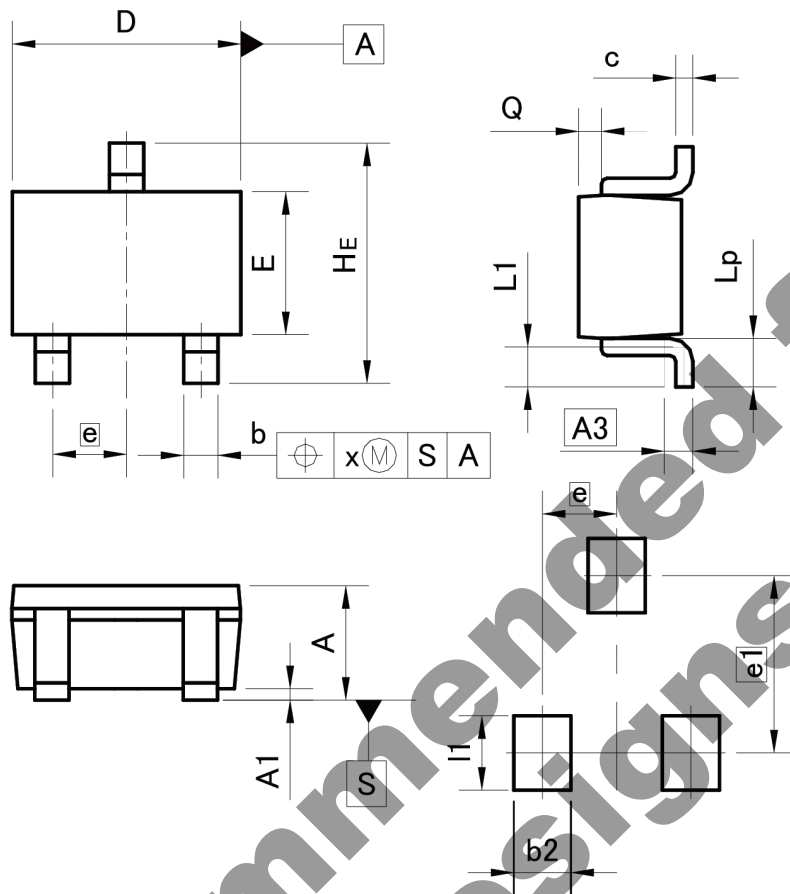
Fig.1-2 Switching Waveforms



Not Recommended for New Designs

●Dimensions

UMT3



Pattern of terminal position areas  
[Not a recommended pattern of soldering pads]

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.00	0.031	0.039
A1	0.00	0.10	0.000	0.004
A3	0.25		0.010	
b	0.15	0.30	0.006	0.012
c	0.10	0.20	0.004	0.008
D	1.90	2.10	0.075	0.083
E	1.15	1.35	0.045	0.053
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L1	0.20	0.50	0.008	0.020
Lp	0.25	0.55	0.010	0.022
Q	0.10	0.30	0.004	0.012
x	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.50	-	0.020
e1	1.55		0.061	
l1	-	0.65	-	0.026

Dimension in mm/inches

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