

# 1.5V Drive Nch MOSFET

## RT1C060UN

### ● Structure

Silicon N-channel MOSFET

### ● Features

- 1) Low on-resistance.
- 2) High power package (TSST8).
- 3) Low voltage drive (1.5V drive).

### ● Application

Switching

### ● Packaging specifications

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	3000
RT1C060UN		O

### ● Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		$V_{DSS}$	20	V
Gate-source voltage		$V_{GSS}$	$\pm 10$	V
Drain current	Continuous	$I_D$	$\pm 6$	A
	Pulsed	$I_{DP}$ *1	$\pm 24$	A
Source current (Body Diode)	Continuous	$I_S$	1	A
	Pulsed	$I_{SP}$ *1	24	A
Power dissipation		$P_D$ *2	1.25	W
Channel temperature		$T_{ch}$	150	°C
Range of storage temperature		$T_{stg}$	-55 to +150	°C

\*1  $P_w \leq 10 \mu s$ , Duty cycle  $\leq 1\%$

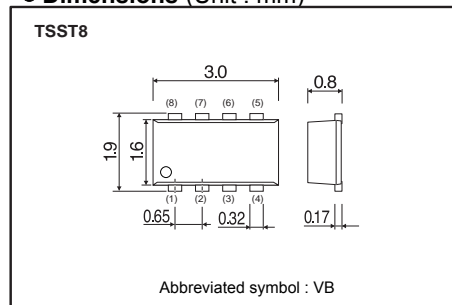
\*2 Each terminal mounted on a ceramic board.

### ● Thermal resistance

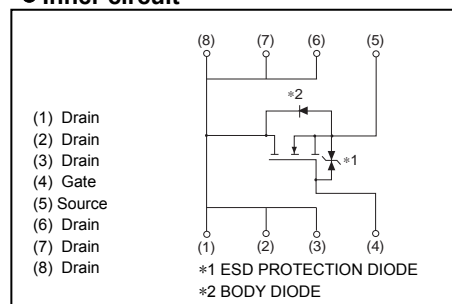
Parameter	Symbol	Limits	Unit
Channel to Ambient	$R_{th}(ch-a)^*$	100	°C / W

\* Each terminal mounted on a ceramic board.

### ● Dimensions (Unit : mm)



### ● Inner circuit



## ● Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Gate-source leakage	$I_{GSS}$	-	-	$\pm 10$	$\mu A$	$V_{GS} = \pm 10V, V_{DS} = 0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	20	-	-	V	$I_D = 1mA, V_{GS} = 0V$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	$\mu A$	$V_{DS} = 20V, V_{GS} = 0V$
Gate threshold voltage	$V_{GS(th)}$	0.3	-	1.0	V	$V_{DS} = 10V, I_D = 1mA$
Static drain-source on-state resistance	$R_{DS(on)}^*$	-	20	28	m $\Omega$	$I_D = 6A, V_{GS} = 4.5V$
		-	24	33		$I_D = 6A, V_{GS} = 2.5V$
		-	28	39		$I_D = 3A, V_{GS} = 1.8V$
		-	33	66		$I_D = 1.2A, V_{GS} = 1.5V$
Forward transfer admittance	$ Y_{fs} ^*$	5.5	-	-	S	$I_D = 6A, V_{DS} = 10V$
Input capacitance	$C_{iss}$	-	870	-	pF	$V_{DS} = 10V$
Output capacitance	$C_{oss}$	-	190	-	pF	$V_{GS} = 0V$
Reverse transfer capacitance	$C_{rss}$	-	85	-	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}^*$	-	7	-	ns	$I_D = 3A, V_{DD} \approx 10V$
Rise time	$t_r^*$	-	30	-	ns	$V_{GS} = 4.5V$
Turn-off delay time	$t_{d(off)}^*$	-	75	-	ns	$R_L = 3.3\Omega$
Fall time	$t_f^*$	-	20	-	ns	$R_G = 10\Omega$
Total gate charge	$Q_g^*$	-	11	-	nC	$I_D = 6A, V_{DD} \approx 10V$
Gate-source charge	$Q_{gs}^*$	-	2.0	-	nC	$V_{GS} = 4.5V, R_L = 1.7\Omega$
Gate-drain charge	$Q_{gd}^*$	-	2.1	-	nC	$R_G = 10\Omega$

\*Pulsed

## ● Body diode characteristics (Source-Drain) (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Forward Voltage	$V_{SD}^*$	-	-	1.2	V	$I_S = 6A, V_{GS} = 0V$

\*Pulsed

# ●Electrical characteristic curves

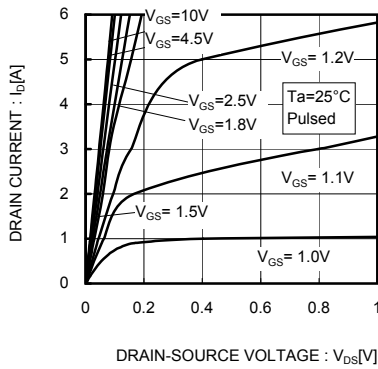


Fig.1 Typical Output Characteristics( I )

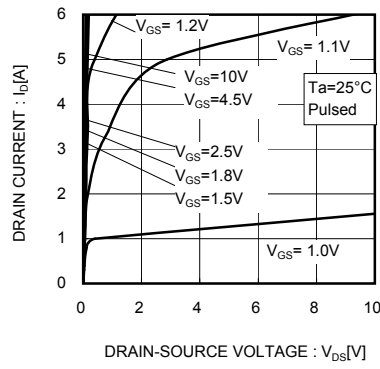


Fig.2 Typical Output Characteristics( II )

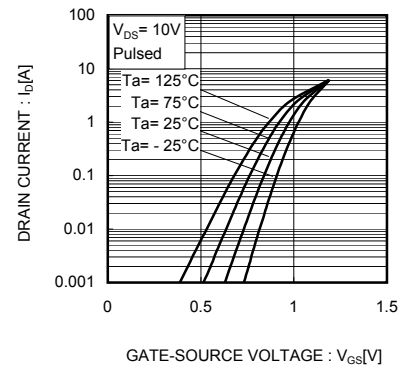


Fig.3 Typical Transfer Characteristics

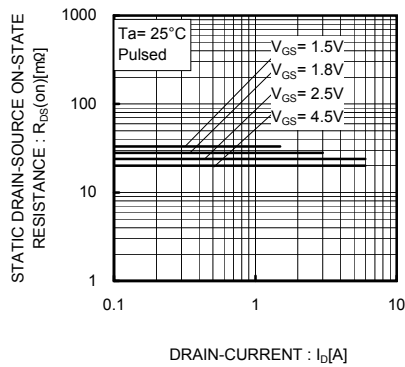


Fig.4 Static Drain-Source On-State Resistance vs. Drain Current( I )

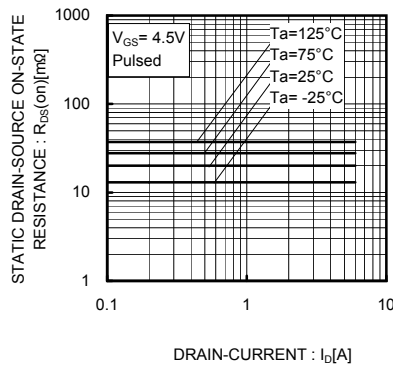


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current( II )

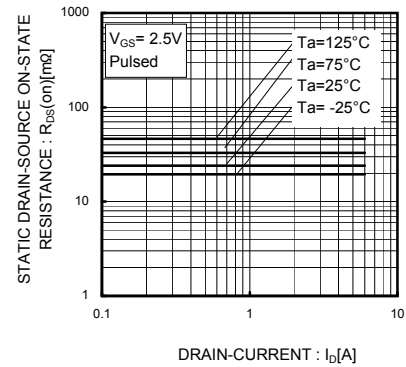


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current( III )

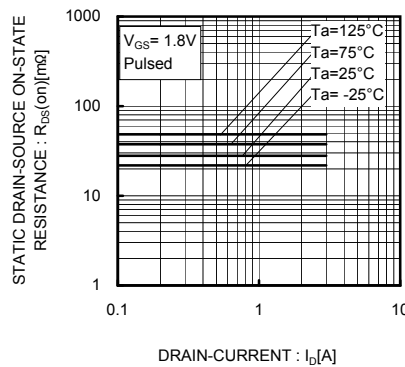


Fig.7 Static Drain-Source On-State Resistance vs. Drain Current( IV )

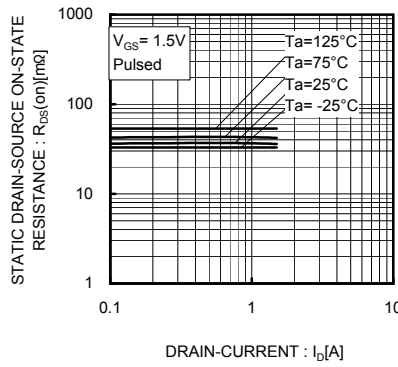


Fig.8 Static Drain-Source On-State Resistance vs. Drain Current( V )

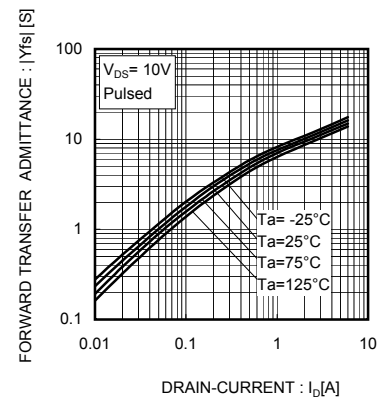


Fig.9 Forward Transfer Admittance vs. Drain Current

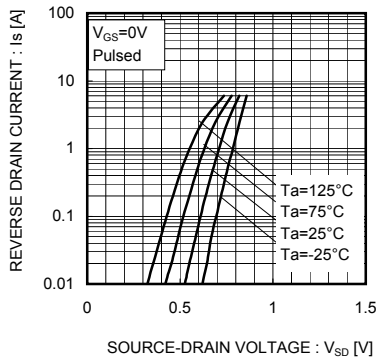


Fig.10 Reverse Drain Current  
vs. Source-Drain Voltage

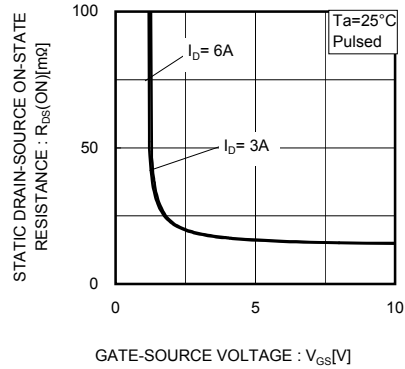


Fig.11 Static Drain-Source On-State  
Resistance vs. Gate Source Voltage

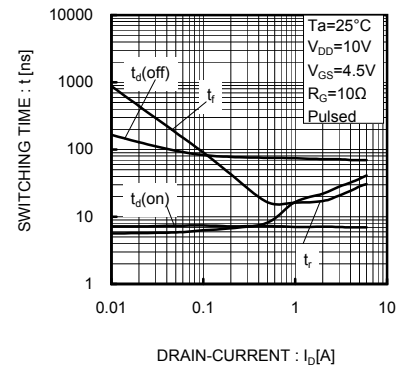


Fig.12 Switching Characteristics

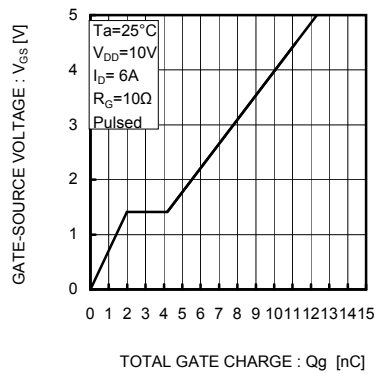


Fig.13 Dynamic Input Characteristics

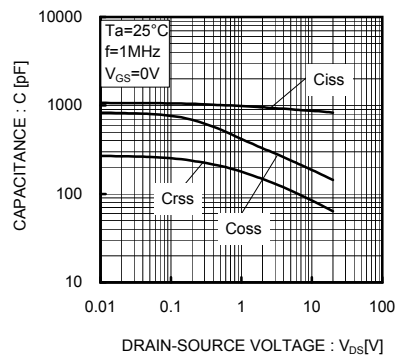


Fig.14 Typical Capacitance  
vs. Drain-Source Voltage

## ● Measurement circuits

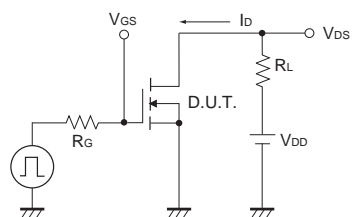


Fig.1-1 Switching time measurement circuit

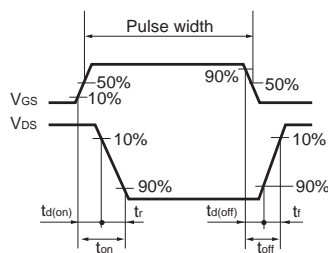


Fig.1-2 Switching waveforms

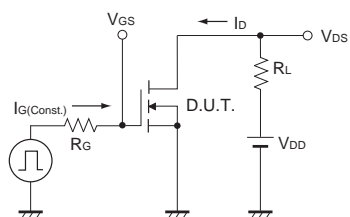


Fig.2-1 Gate charge measurement circuit

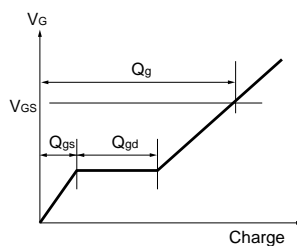


Fig.2-2 Gate Charge Waveform

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