

$V_{DSS}$	30V
$R_{DS(on)(Max.)}$	23.7m $\Omega$
$I_D$	$\pm 4.5A$
$P_D$	1W

### ●Features

- 1) Low on - resistance.
- 2) High Power Package (TUMT6).
- 3) Pb-free lead plating ; RoHS compliant.
- 4) Halogen Free.

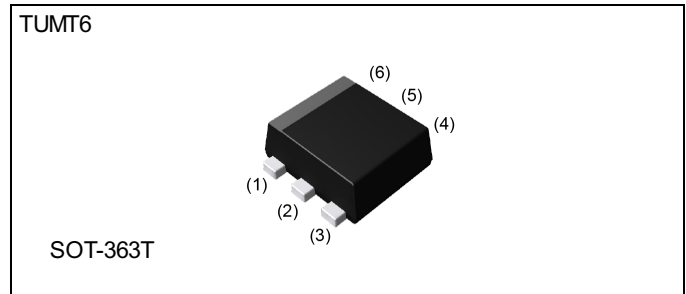
### ●Application

Switching

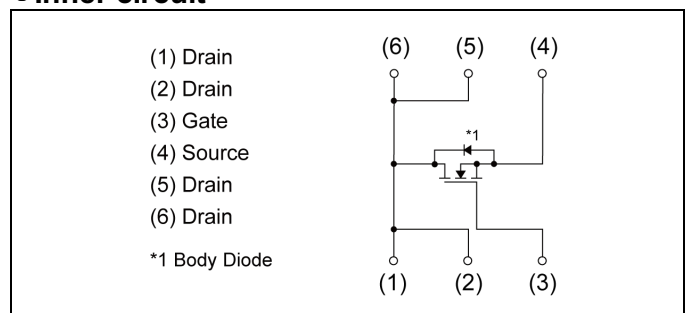
### ●Absolute maximum ratings ( $T_a = 25^\circ C$ )

Parameter	Symbol	Value	Unit
Drain - Source voltage	$V_{DSS}$	30	V
Continuous drain current	$I_D$	$\pm 4.5$	A
Pulsed drain current	$I_{D,pulse}^{*1}$	$\pm 18$	A
Gate - Source voltage	$V_{GSS}$	$\pm 12$	V
Power dissipation	$P_D^{*2}$	1	W
Junction temperature	$T_j$	150	$^\circ C$
Range of storage temperature	$T_{stg}$	-55 to +150	$^\circ C$

### ●Outline



### ●Inner circuit



### ●Packaging specifications

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

## ● Thermal resistance

Parameter	Symbol	Values			Unit
		Min.	Typ.	Max.	
Thermal resistance, junction - ambient	$R_{thJA}^{*2}$	-	-	125	°C/W

● Electrical characteristics ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Drain - Source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 1mA$	30	-	-	V
Breakdown voltage temperature coefficient	$\frac{\Delta V_{(BR)DSS}}{\Delta T_j}$	$I_D = 1mA$ referenced to $25^\circ\text{C}$	-	18	-	mV/°C
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 30V, V_{GS} = 0V$	-	-	1	μA
Gate - Source leakage current	$I_{GSS}$	$V_{GS} = \pm 12V, V_{DS} = 0V$	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 1mA$	0.5	-	1.5	V
Gate threshold voltage temperature coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_j}$	$I_D = 1mA$ referenced to $25^\circ\text{C}$	-	-2	-	mV/°C
Static drain - source on - state resistance	$R_{DS(on)}^{*3}$	$V_{GS} = 4.5V, I_D = 4.5A$	-	16.9	23.7	mΩ
		$V_{GS} = 2.5V, I_D = 4.5A$	-	23.9	33.5	
Gate input resistance	$R_G$	f = , open drain	-	2.7	-	Ω
Forward Transfer Admittance	$ Y_{fs} ^{*3}$	$V_{DS} = 5V, I_D = 4.5A$	6	-	-	S

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

\*2 Mounted on a ceramic board (30×30×0.8mm)

\*3 Pulsed

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

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V	-	900	-	pF
Output capacitance	C <sub>oss</sub>	V <sub>DS</sub> = 15V	-	100	-	
Reverse transfer capacitance	C <sub>rss</sub>	f = 1MHz	-	70	-	
Turn - on delay time	t <sub>d(on)</sub> <sup>*3</sup>	V <sub>DD</sub> ≈ 15V, V <sub>GS</sub> = 4.5V	-	15	-	ns
Rise time	t <sub>r</sub> <sup>*3</sup>	I <sub>D</sub> = 2.2A	-	15	-	
Turn - off delay time	t <sub>d(off)</sub> <sup>*3</sup>	R <sub>L</sub> ≈ 6.8Ω	-	40	-	
Fall time	t <sub>f</sub> <sup>*3</sup>	R <sub>G</sub> = 10Ω	-	10	-	

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

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Total gate charge	Q <sub>g</sub> <sup>*3</sup>	V <sub>DD</sub> ≈ 15V, I <sub>D</sub> = 4.5A, V <sub>GS</sub> = 4.5V	-	8.1	-	nC
Gate - Source charge	Q <sub>gs</sub> <sup>*3</sup>		-	2.1	-	
Gate - Drain charge	Q <sub>gd</sub> <sup>*3</sup>		-	2.0	-	

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

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Body diode continuous forward current	I <sub>S</sub>	T <sub>a</sub> = 25°C	-	-	0.8	A
Body diode pulse current	I <sub>SP</sub> <sup>*1</sup>		-	-	18	A
Forward voltage	V <sub>SD</sub> <sup>*3</sup>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 0.8A	-	-	1.2	V

● Electrical characteristic curves

Fig.1 Power Dissipation Derating Curve



Fig.2 Maximum Safe Operating Area

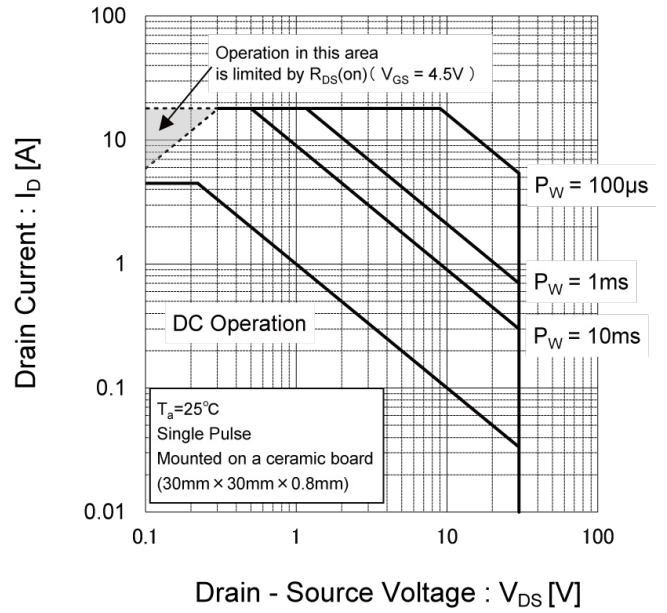


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

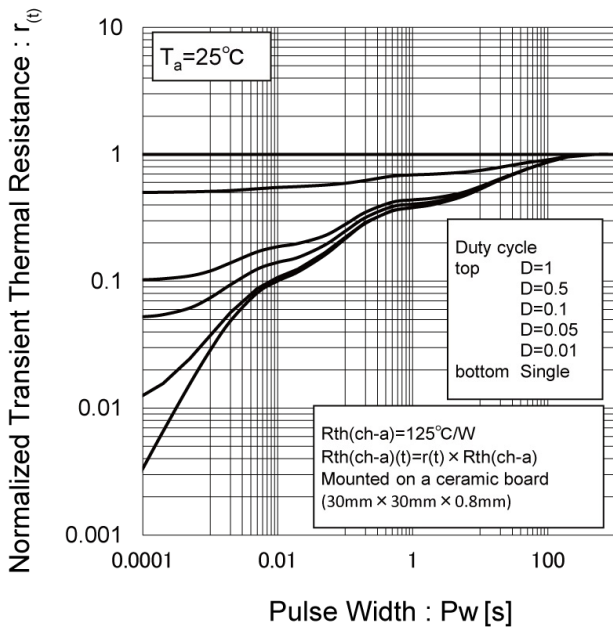
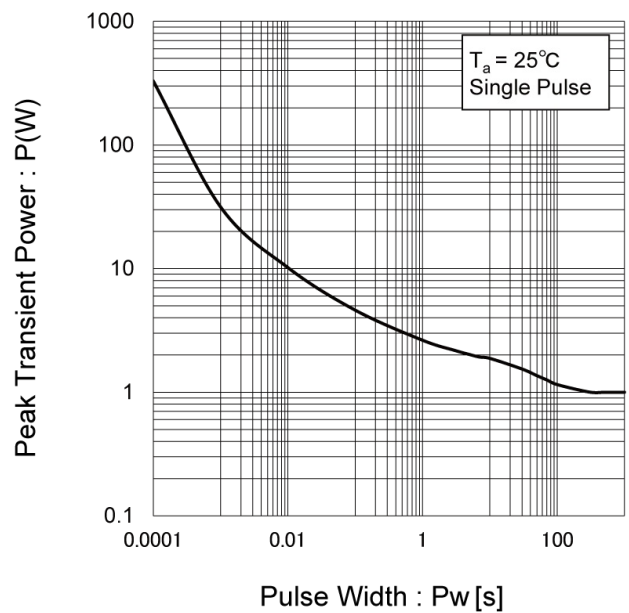


Fig.4 Single Pulse Maximum Power dissipation



● Electrical characteristic curves

Fig.5 Typical Output Characteristics(I)

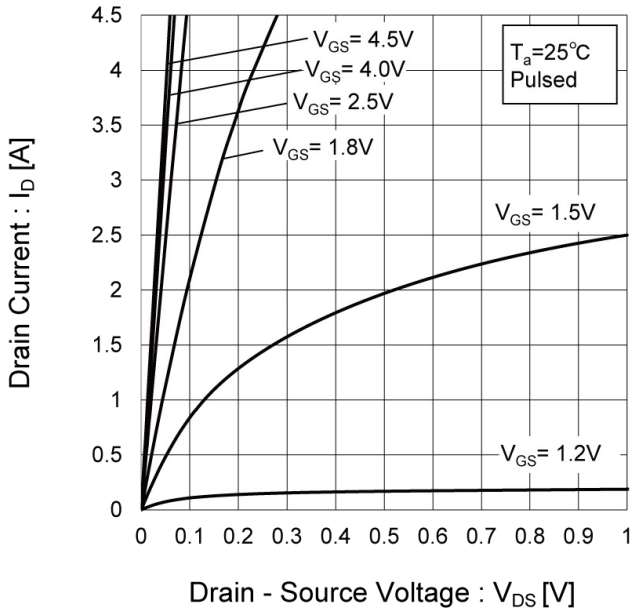


Fig.6 Typical Output Characteristics(II)

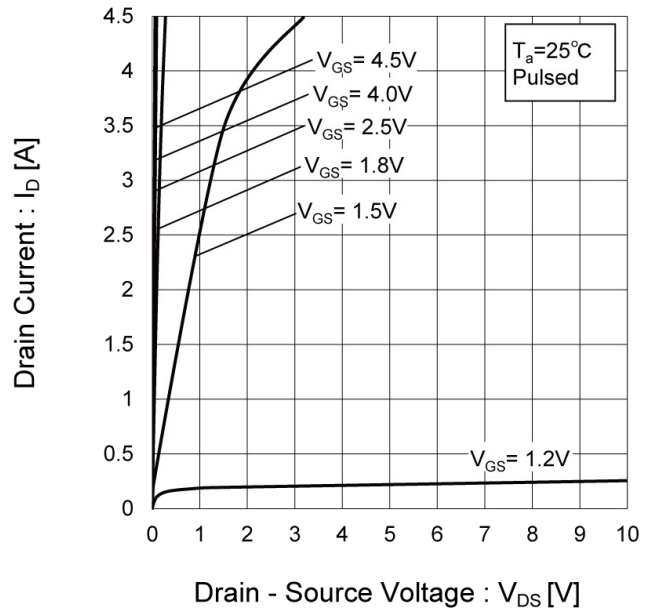
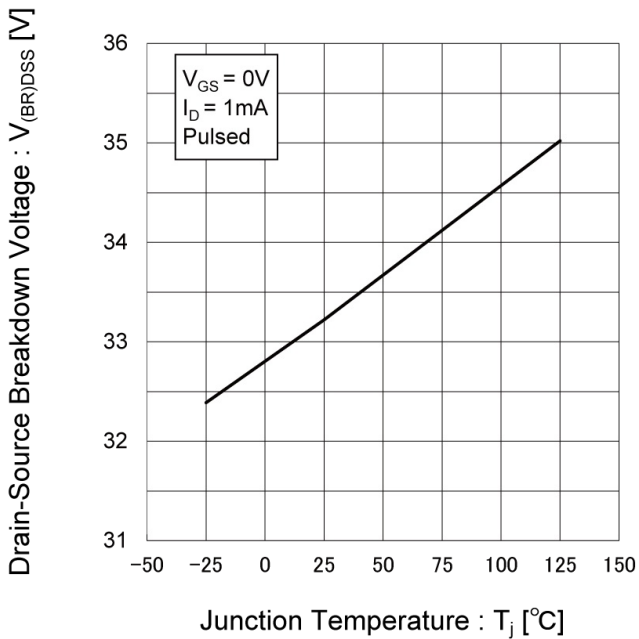


Fig.7 Breakdown Voltage vs. Junction Temperature



●Electrical characteristic curves

Fig.8 Typical Transfer Characteristics

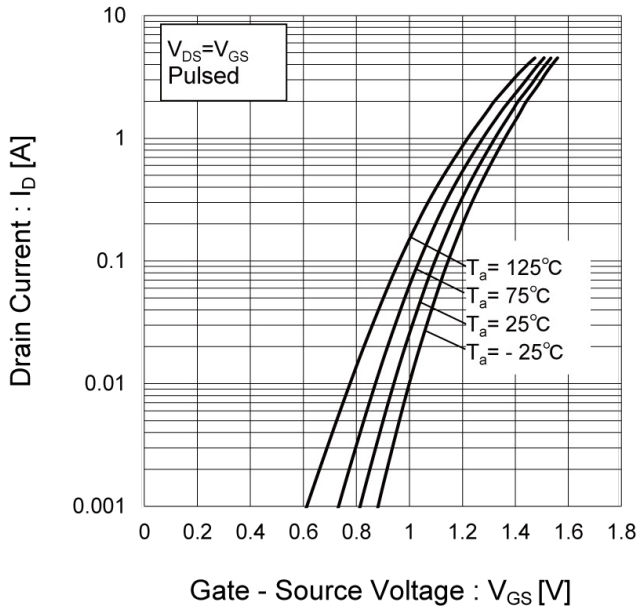


Fig.9 Gate Threshold Voltage vs. Junction Temperature

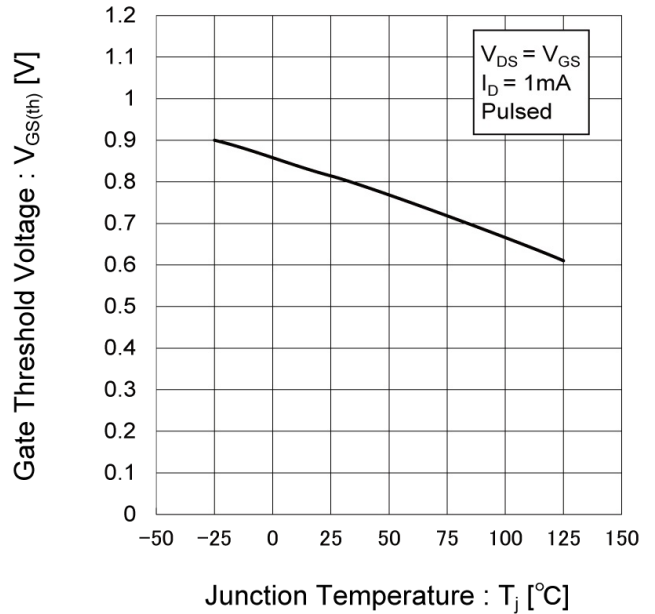
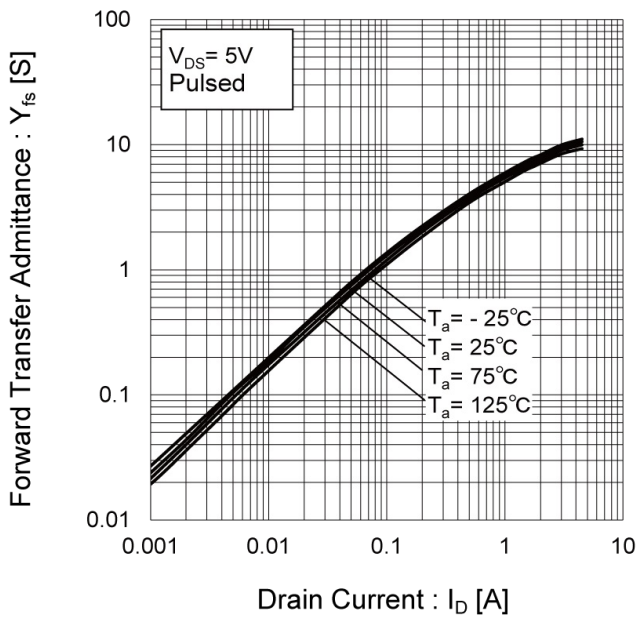


Fig.10 Transconductance vs. Drain Current



● Electrical characteristic curves

Fig.11 Drain Current Derating Curve



Fig.12 Static Drain - Source On - State Resistance vs. Gate Source Voltage

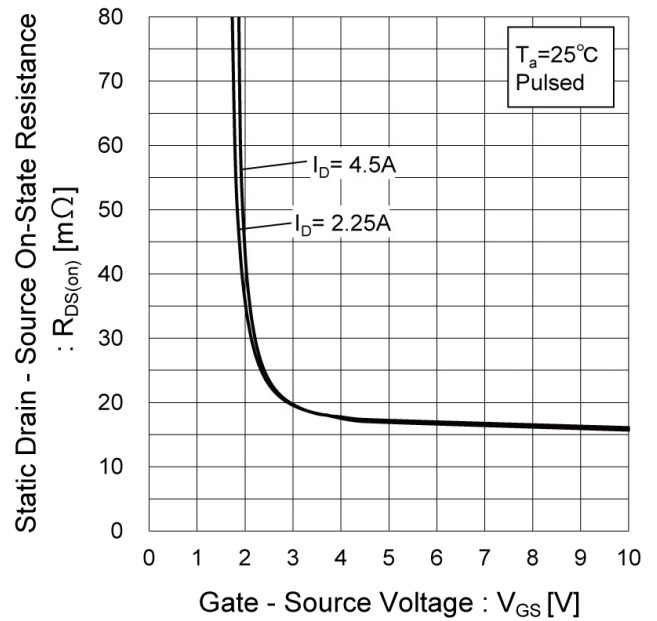
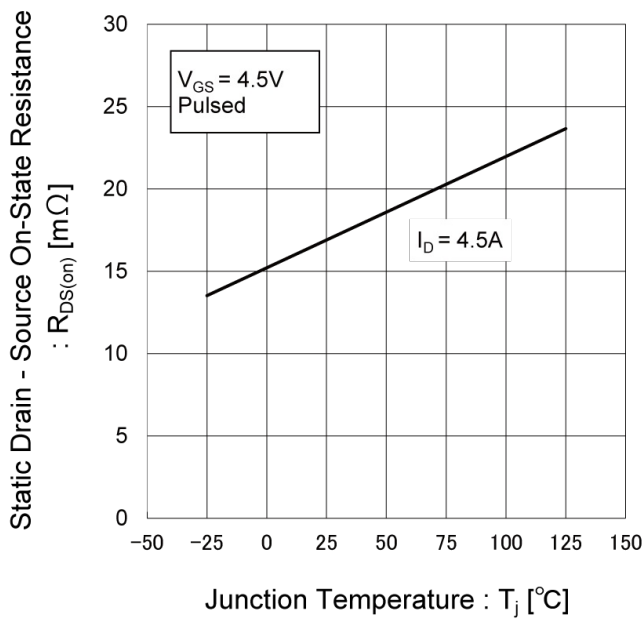


Fig.13 Static Drain - Source On - State Resistance vs. Junction Temperature



● Electrical characteristic curves

Fig.14 Static Drain - Source On - State Resistance vs. Drain Current(I)

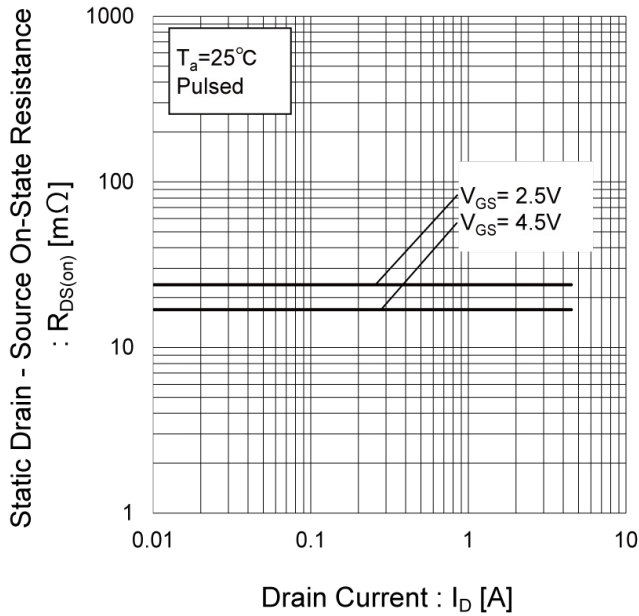


Fig.15 Static Drain - Source On - State Resistance vs. Drain Current(II)

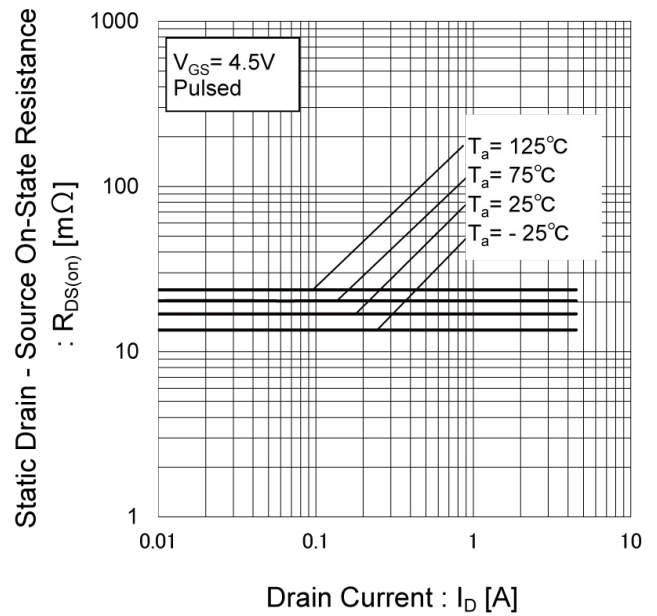
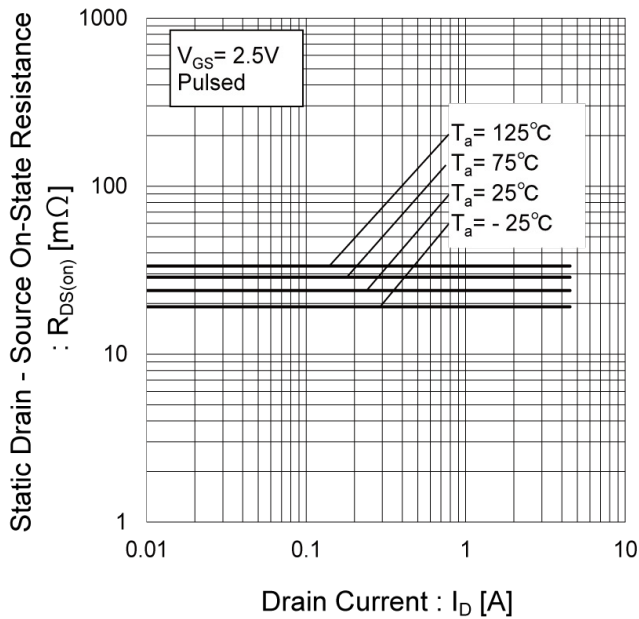


Fig.16 Static Drain - Source On - State Resistance vs. Drain Current(III)





●Electrical characteristic curves

Fig.17 Typical Capacitance vs. Drain - Source Voltage

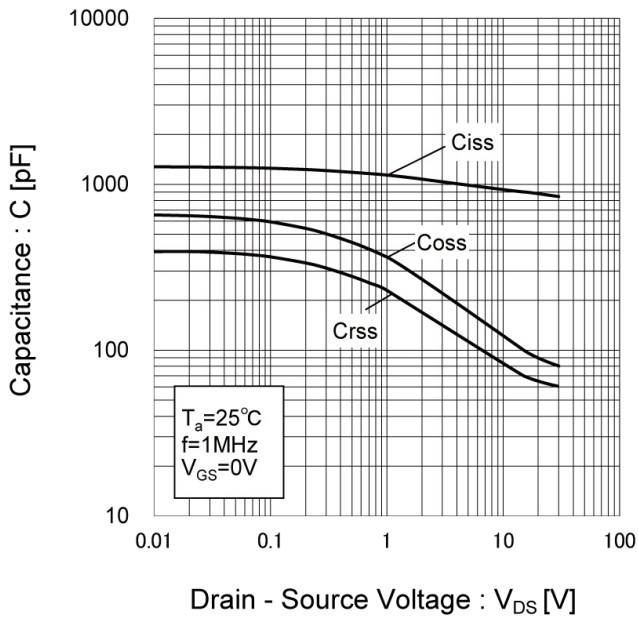


Fig.18 Switching Characteristics

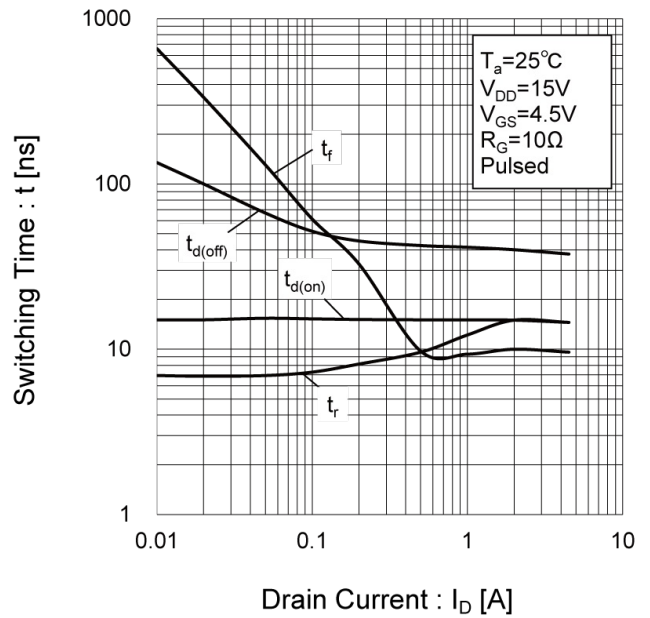


Fig.19 Dynamic Input Characteristics

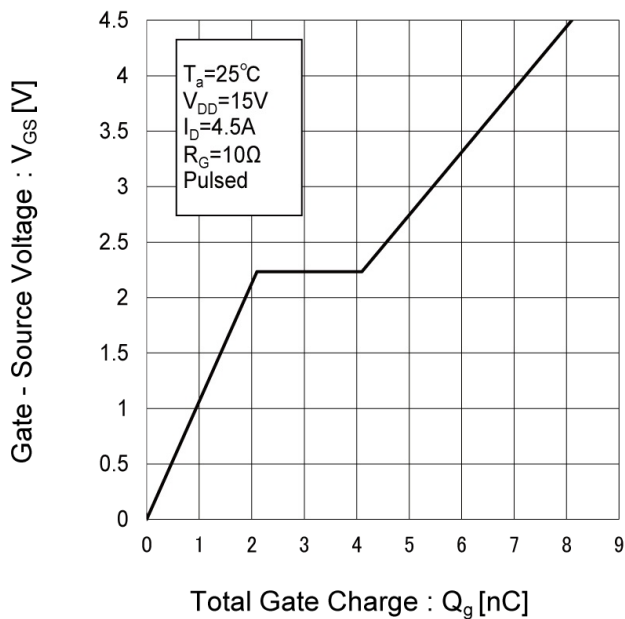
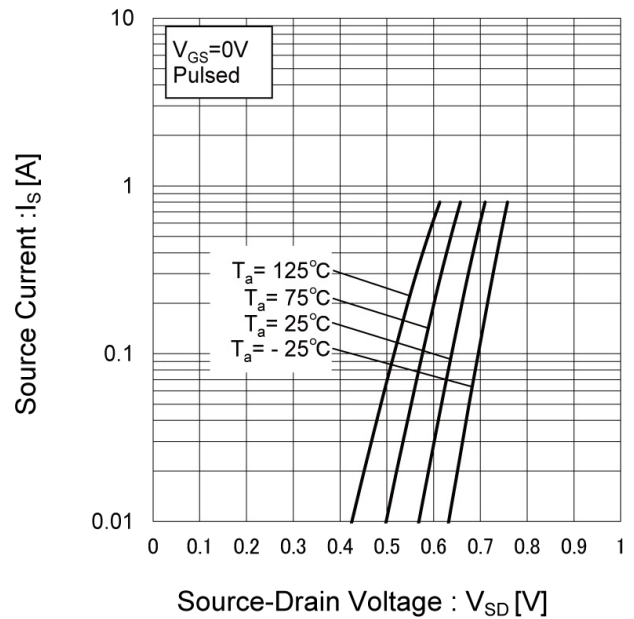


Fig.20 Source Current vs. Source Drain Voltage



● Measurement circuits

Fig.1-1 Switching Time Measurement Circuit



Fig.1-2 Switching Waveforms

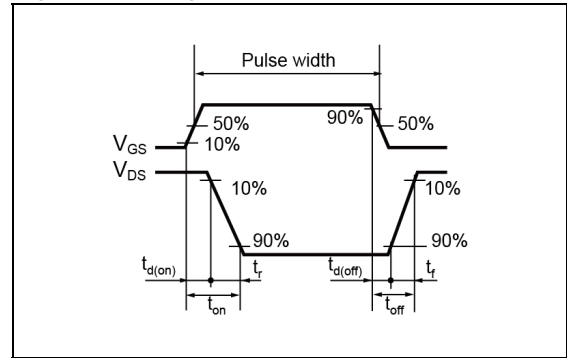


Fig.2-1 Gate Charge Measurement Circuit

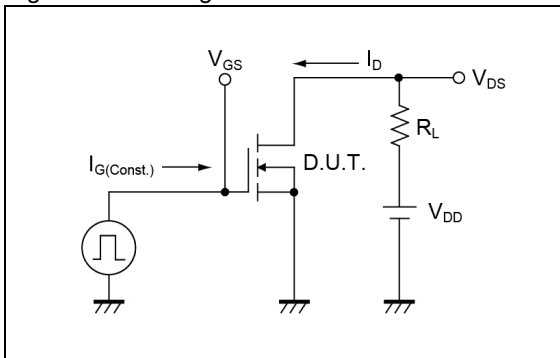
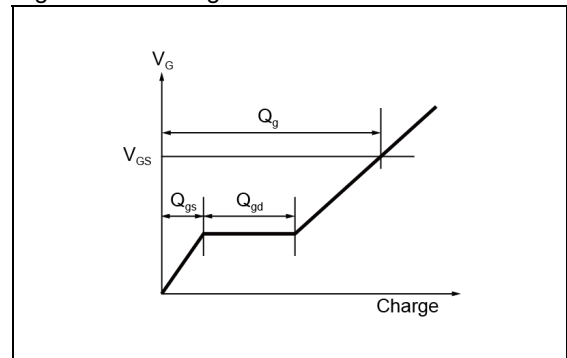


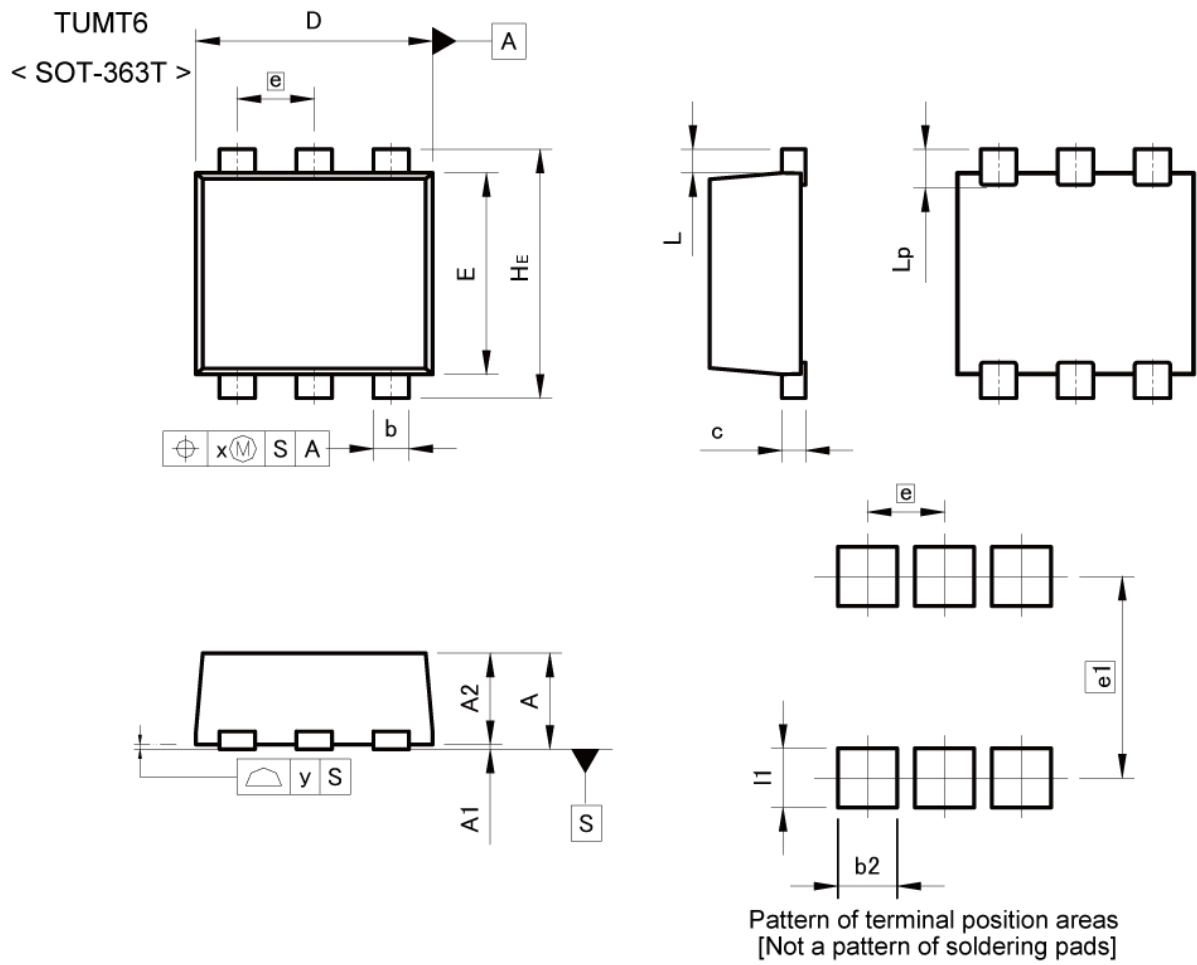
Fig.2-2 Gate Charge Waveform



● Notice

This product might cause chip aging and breakdown under the large electrified environment. Please consider to design ESD protection circuit.

●Dimensions



DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	0.85	-	0.033
A1	0.00	0.10	0.000	0.004
A2	0.72	0.82	0.028	0.032
b	0.25	0.40	0.010	0.016
c	0.12	0.22	0.005	0.009
D	1.90	2.10	0.075	0.083
E	1.60	1.80	0.063	0.071
e	0.65		0.026	
HE	2.00	2.20	0.079	0.087
L	0.20		0.008	
Lp	-	0.40	-	0.016
x	-	0.10	-	0.004
y	-	0.10	-	0.004

DIM	MILIMETERS		INCHES	
	MIN	MAX	MIN	MAX
b2	-	0.50	-	0.020
e1	1.70		0.067	
I1	-	0.50	-	0.020

Dimension in mm/inches

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## RF6E045AJ - Web Page

[Distribution Inventory](#)

Part Number	RF6E045AJ
Package	TUMT6
Unit Quantity	3000
Minimum Package Quantity	3000
Packing Type	Taping
Constitution Materials List	inquiry
RoHS	Yes