

V_{DSS}	30V
$R_{DS(on)(Max.)}$	23.7m Ω
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.

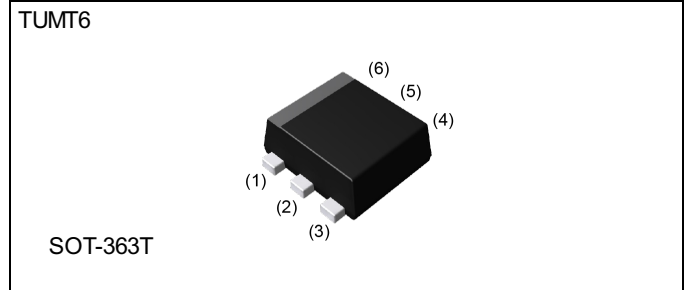
●Application

Switching

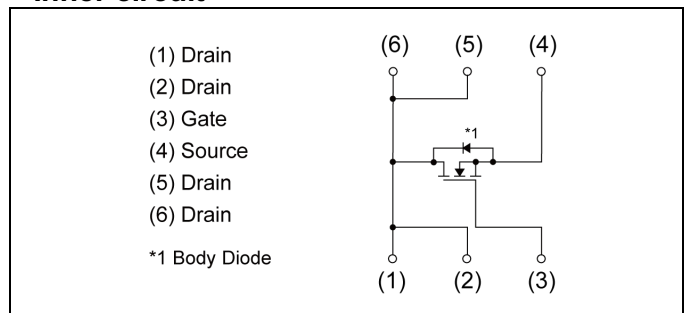
●Absolute maximum ratings ($T_a = 25^\circ C$)

Parameter	Symbol	Value	Unit
Drain - Source voltage	V_{DSS}	30	V
Continuous drain current	I_D	± 4.5	A
Pulsed drain current	$I_{D,pulse}^{*1}$	± 18	A
Gate - Source voltage	V_{GSS}	± 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°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°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_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Input capacitance	C _{iss}	V _{GS} = 0V	-	900	-	pF
Output capacitance	C _{oss}	V _{DS} = 15V	-	100	-	
Reverse transfer capacitance	C _{rss}	f = 1MHz	-	70	-	
Turn - on delay time	t _{d(on)} ^{*3}	V _{DD} ≈ 15V, V _{GS} = 4.5V	-	15	-	ns
Rise time	t _r ^{*3}	I _D = 2.2A	-	15	-	
Turn - off delay time	t _{d(off)} ^{*3}	R _L ≈ 6.8Ω	-	40	-	
Fall time	t _f ^{*3}	R _G = 10Ω	-	10	-	

●Gate charge characteristics (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Total gate charge	Q _g ^{*3}	V _{DD} ≈ 15V, I _D = 4.5A, V _{GS} = 4.5V	-	8.1	-	nC
Gate - Source charge	Q _{gs} ^{*3}		-	2.1	-	
Gate - Drain charge	Q _{gd} ^{*3}		-	2.0	-	

●Body diode electrical characteristics (Source-Drain) (T_a = 25°C)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Body diode continuous forward current	I _S	T _a = 25°C	-	-	0.8	A
Body diode pulse current	I _{SP} ^{*1}		-	-	18	A
Forward voltage	V _{SD} ^{*3}	V _{GS} = 0V, I _S = 0.8A	-	-	1.2	V

● Electrical characteristic curves

Fig.1 Power Dissipation Derating Curve

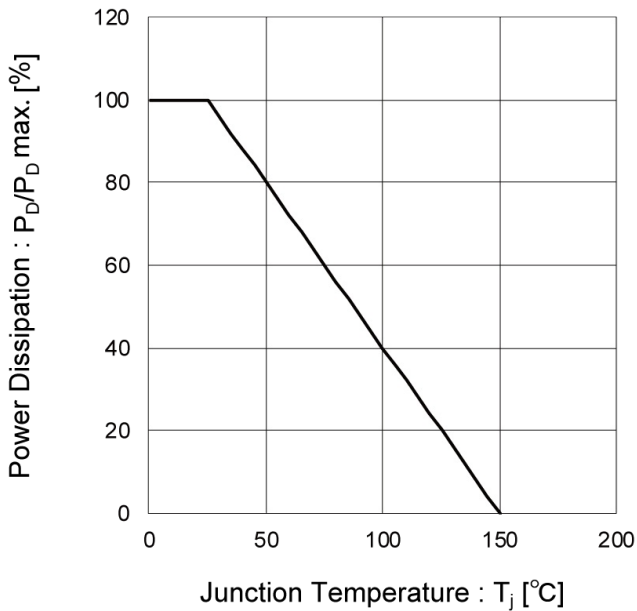


Fig.2 Maximum Safe Operating Area

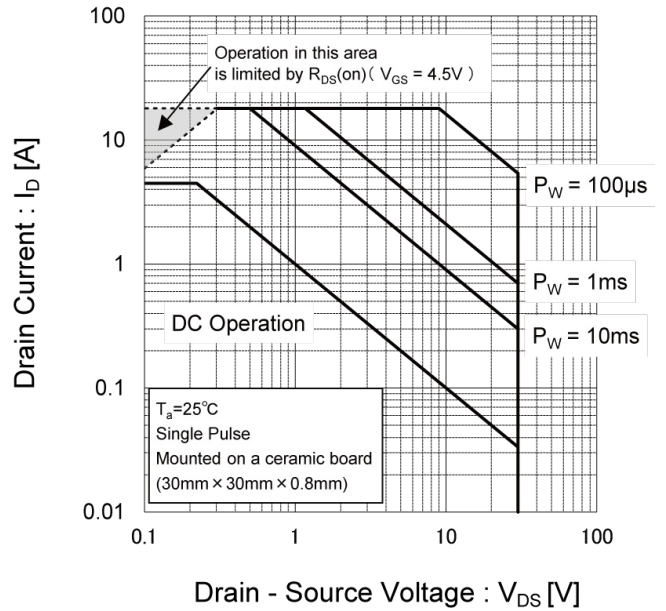


Fig.3 Normalized Transient Thermal Resistance vs. Pulse Width

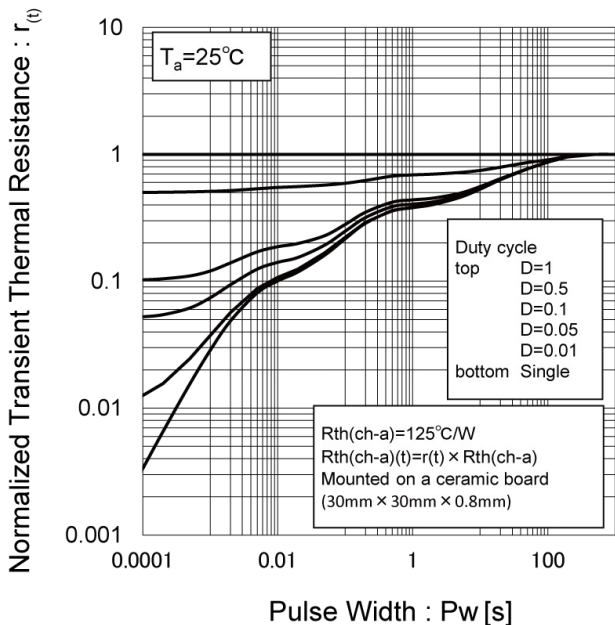
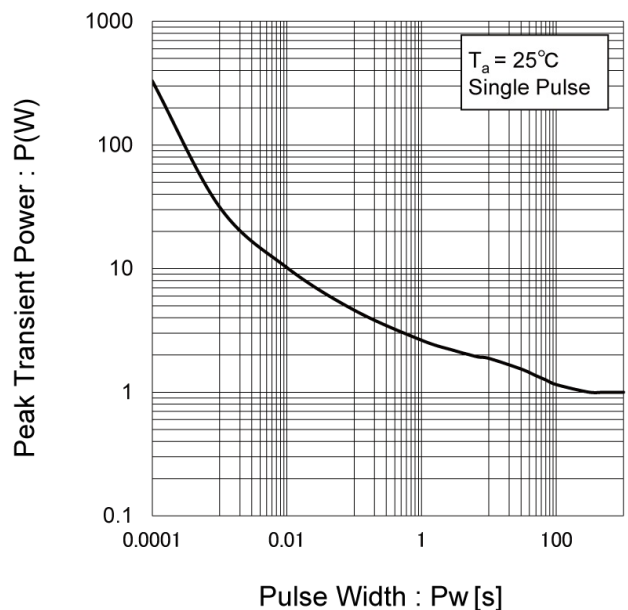


Fig.4 Single Pulse Maximum Power dissipation



● Electrical characteristic curves

Fig.5 Typical Output Characteristics(I)

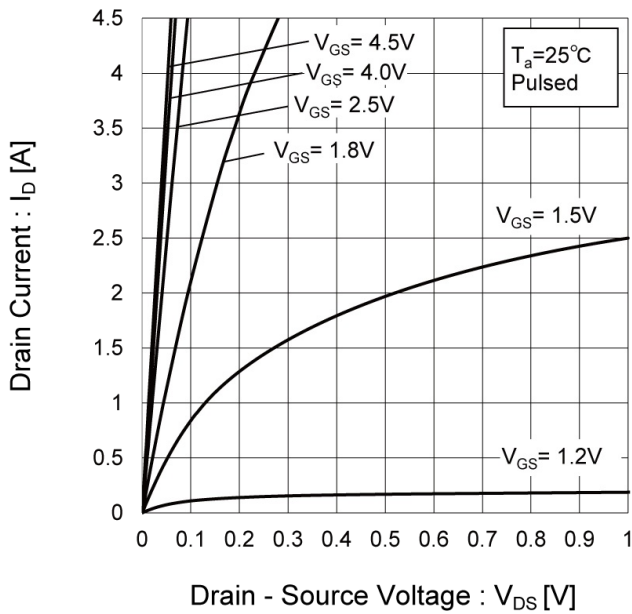


Fig.6 Typical Output Characteristics(II)

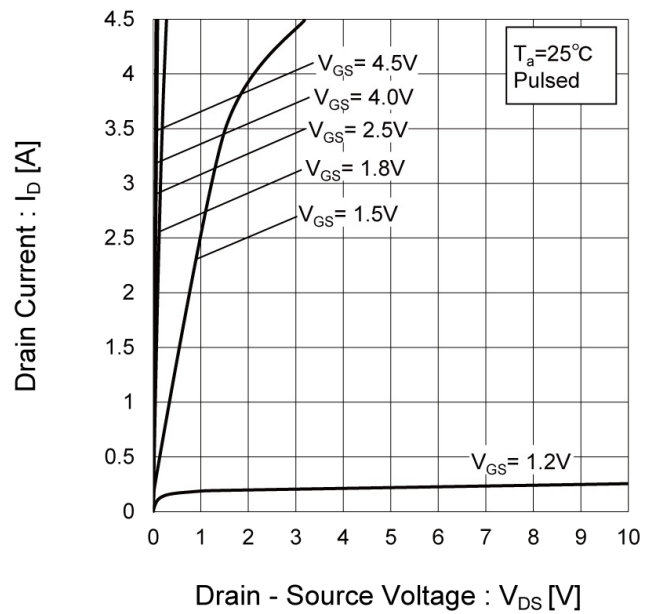
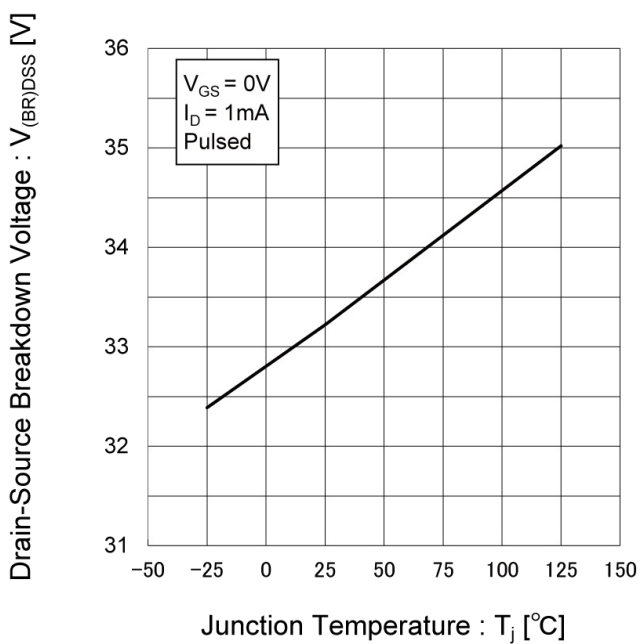


Fig.7 Breakdown Voltage vs. Junction Temperature



●Electrical characteristic curves

Fig.8 Typical Transfer Characteristics

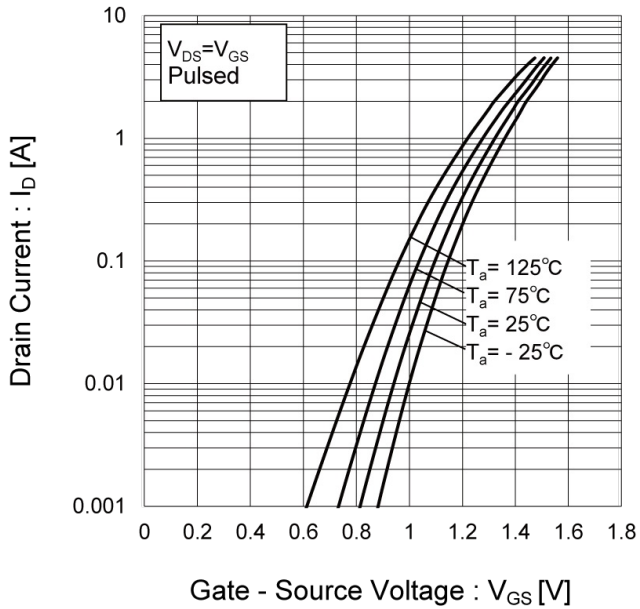


Fig.9 Gate Threshold Voltage vs. Junction Temperature

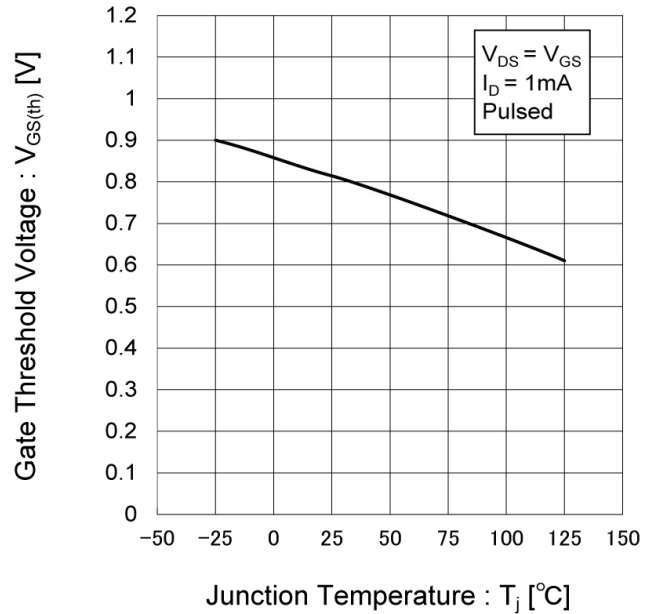
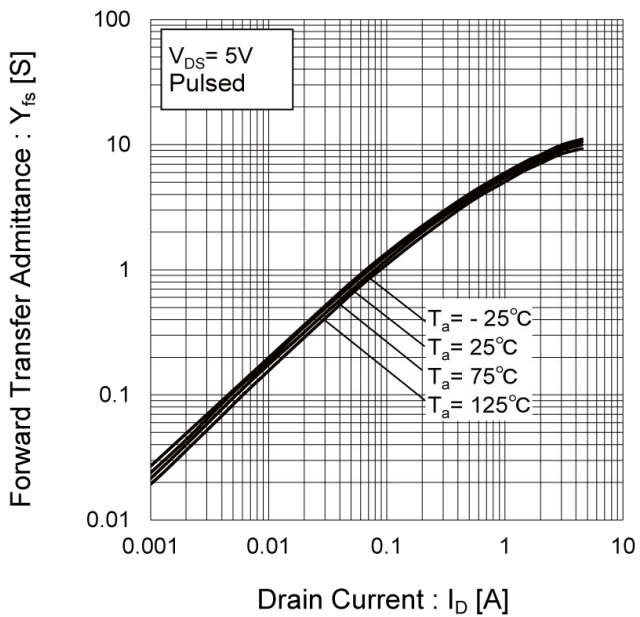


Fig.10 Transconductance vs. Drain Current



●Electrical characteristic curves

Fig.11 Drain Current Derating Curve

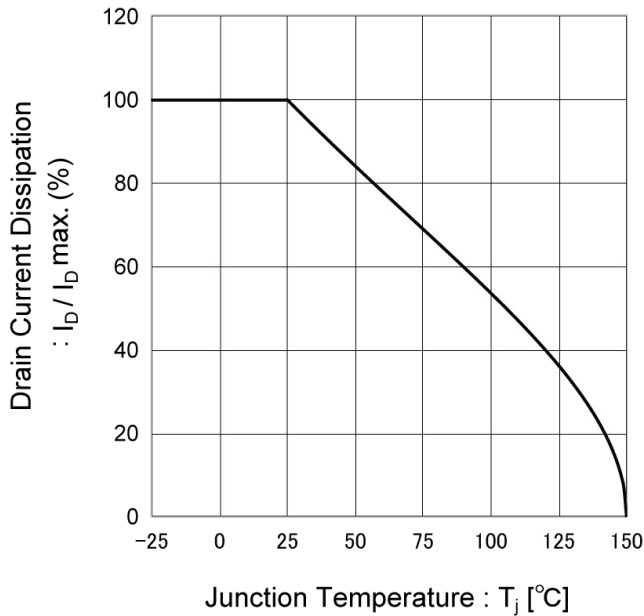


Fig.12 Static Drain - Source On - State Resistance vs. Gate Source Voltage

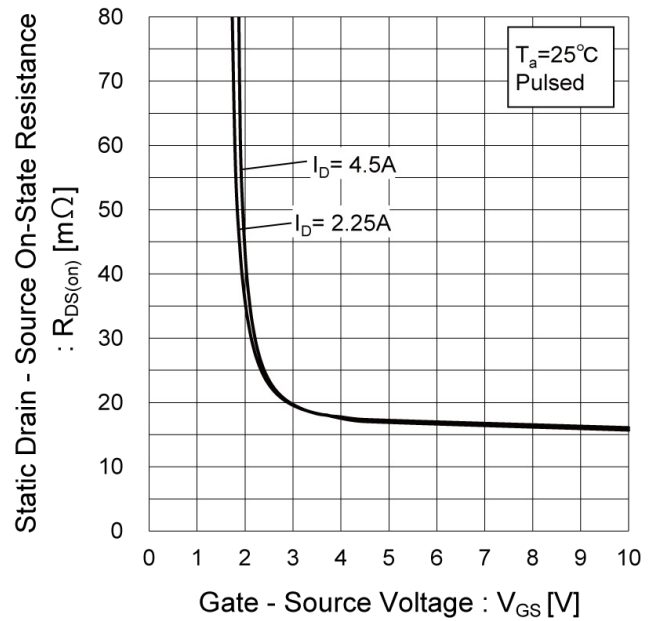
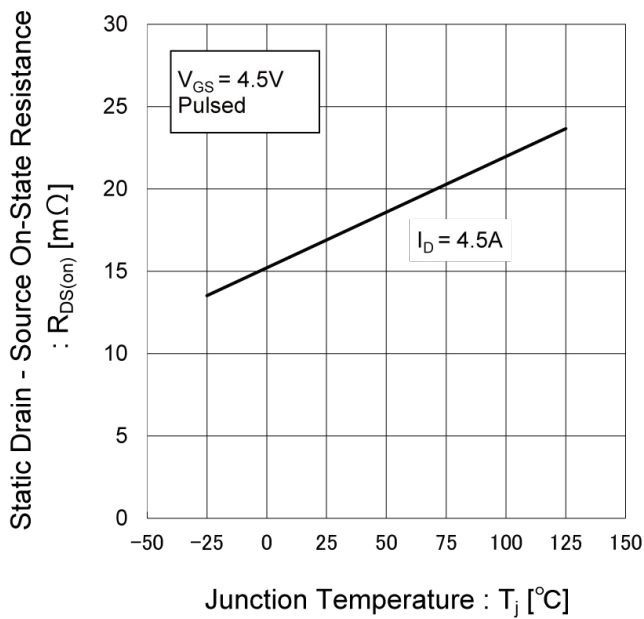


Fig.13 Static Drain - Source On - State Resistance vs. Junction Temperature



● Electrical characteristic curves

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

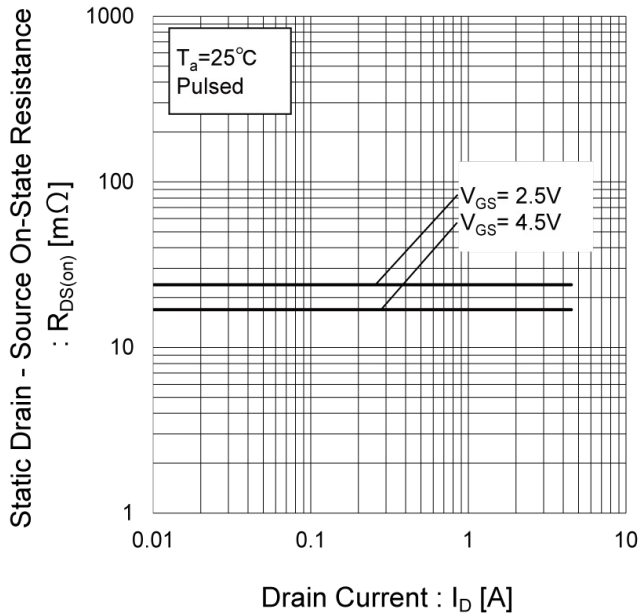


Fig.15 Static Drain - Source On - State Resistance vs. Drain Current(II)

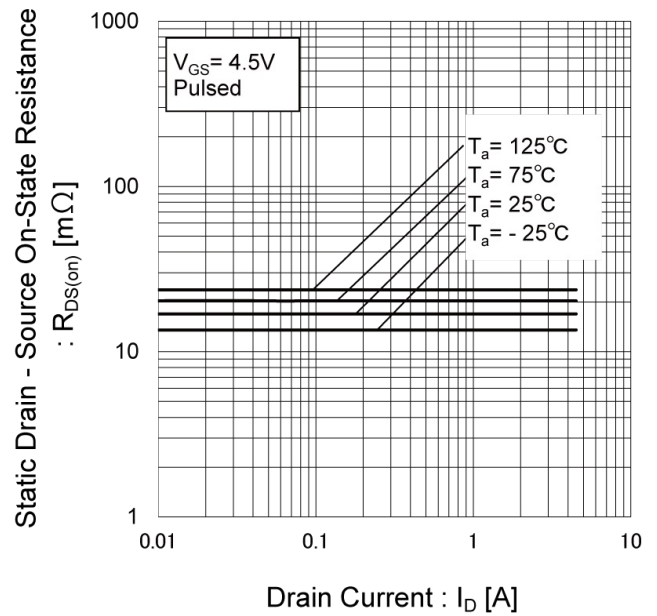
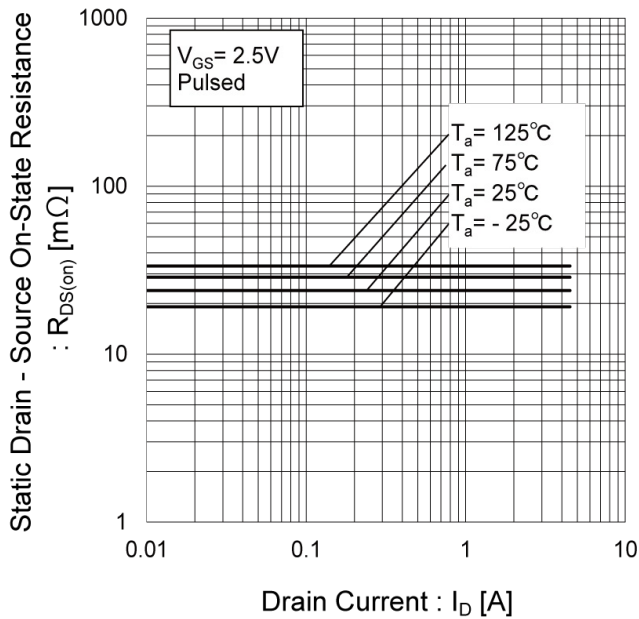


Fig.16 Static Drain - Source On - State Resistance vs. Drain Current(III)



●Electrical characteristic curves

Fig.17 Typical Capacitance vs. Drain - Source Voltage

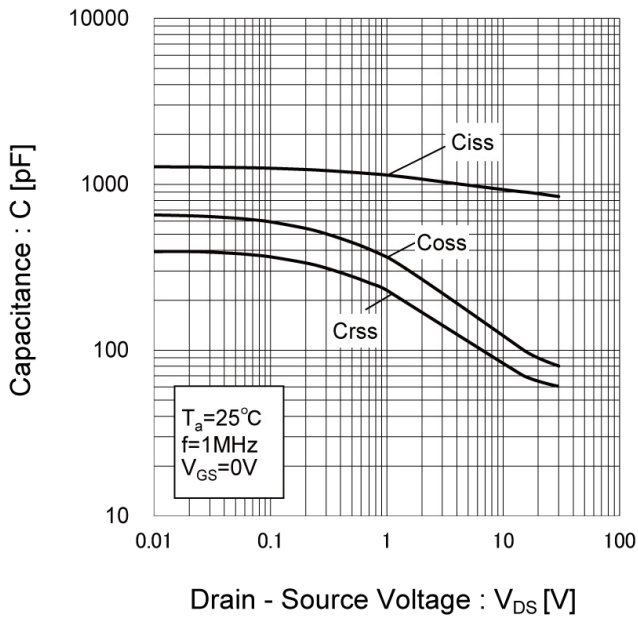


Fig.18 Switching Characteristics

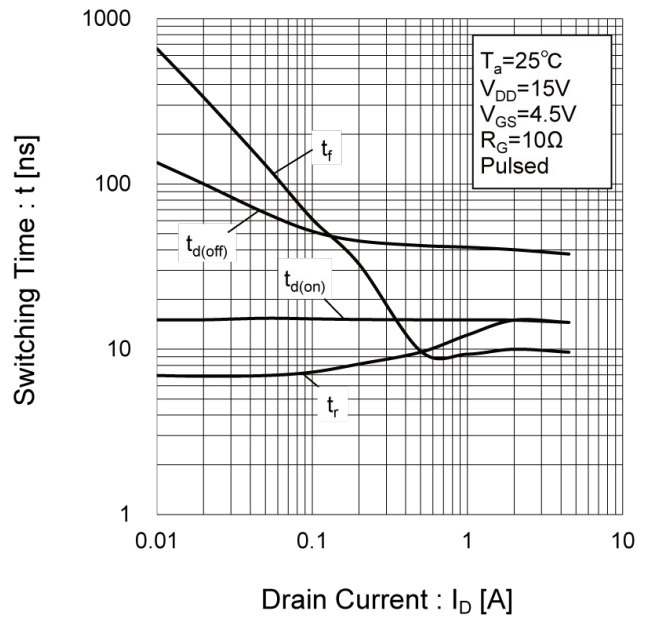


Fig.19 Dynamic Input Characteristics

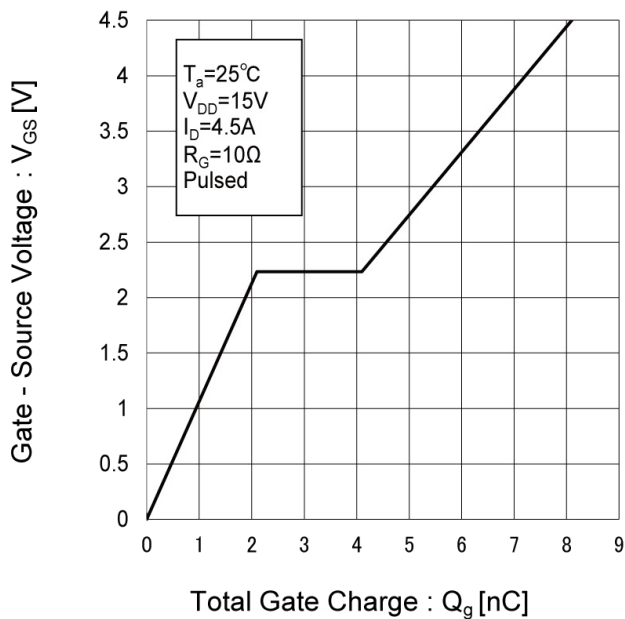
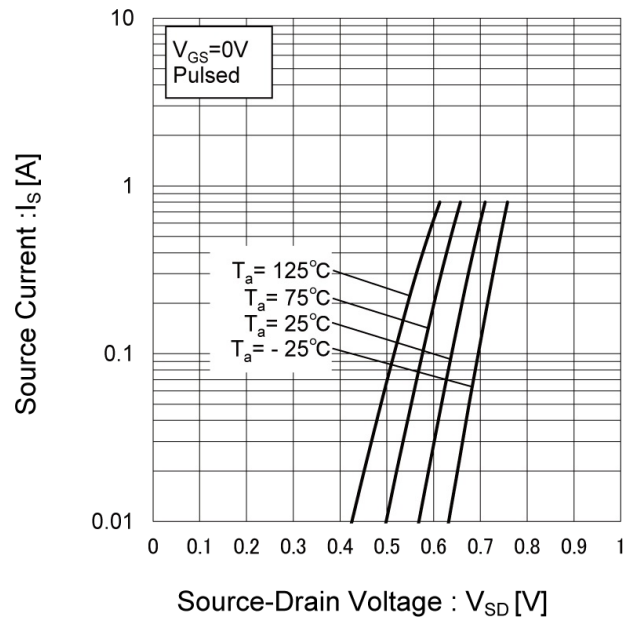


Fig.20 Source Current vs. Source Drain Voltage



● Measurement circuits

Fig.1-1 Switching Time Measurement Circuit

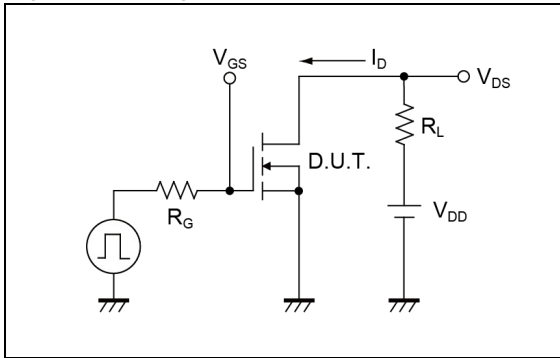


Fig.1-2 Switching Waveforms

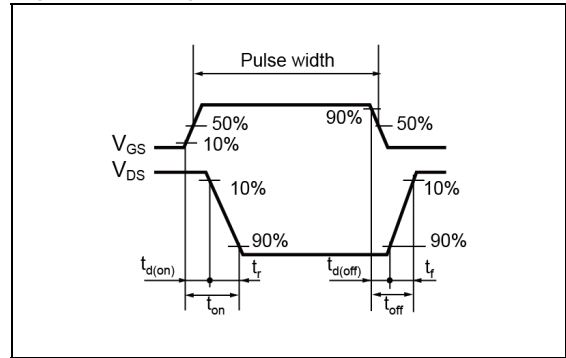


Fig.2-1 Gate Charge Measurement Circuit

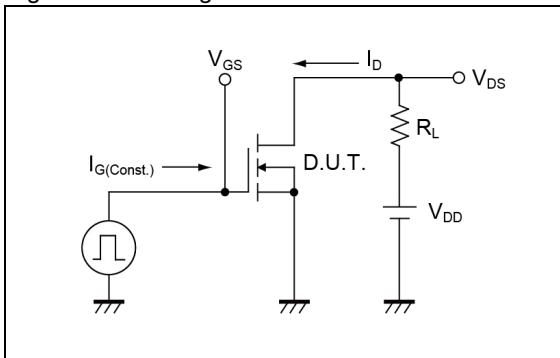
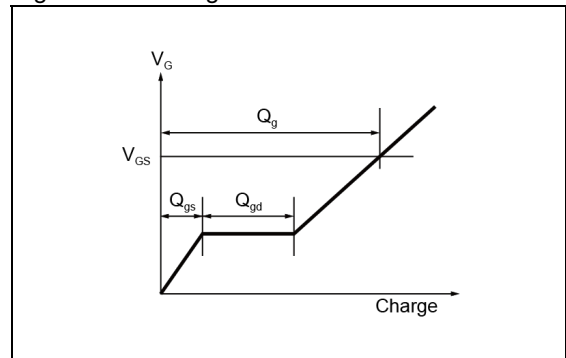


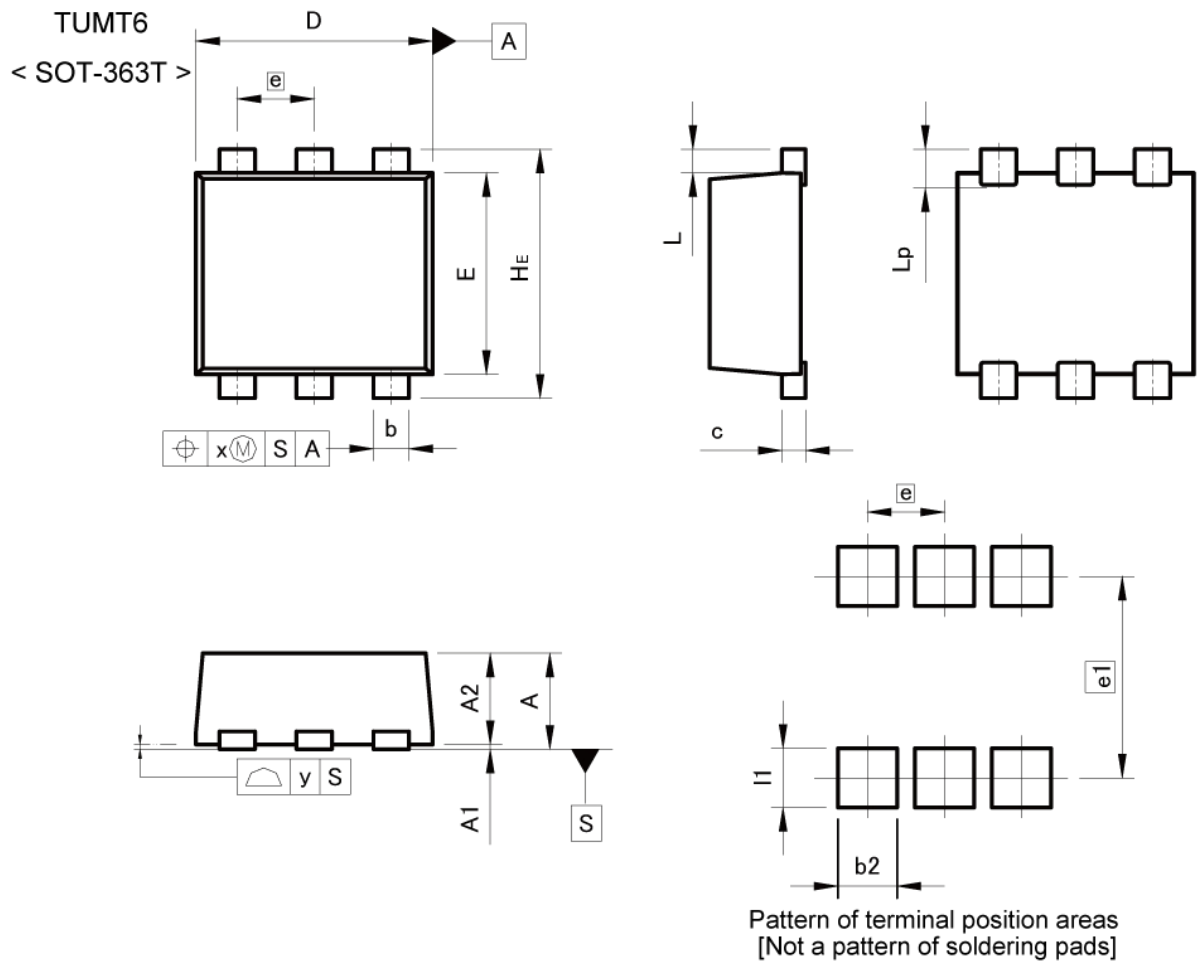
Fig.2-2 Gate Charge Waveform



● 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