

●Application

- Motor drive
- Inverter, Converter
- Photovoltaics, wind power generation.
- Induction heating equipment.

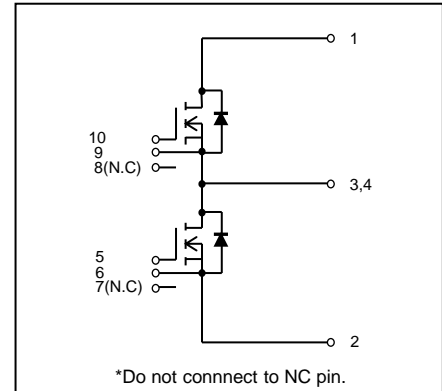
●Features

- 1) Low surge, low switching loss.
- 2) High-speed switching possible.
- 3) Reduced temperature dependence.

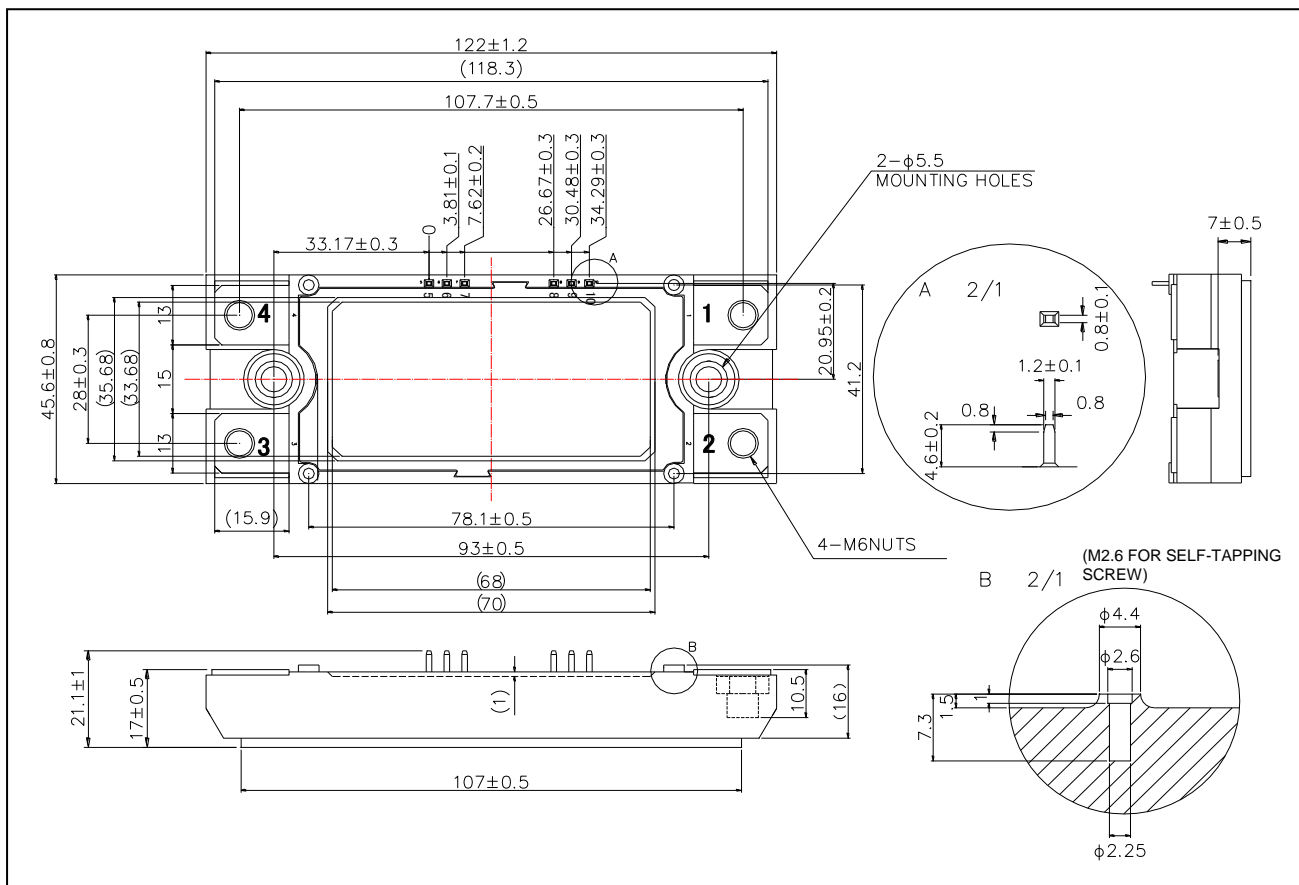
●Construction

This product is a half bridge module consisting of SiC-DMOS from ROHM.

●Circuit diagram



●Dimensions & Pin layout (Unit : mm)



● **Absolute maximum ratings** (T_j = 25°C)

Parameter	Symbol	Conditions	Limit	Unit
Drain-source voltage	V _{DSS}	G-S short	1200	V
Gate-source voltage(+)	V _{GSS}	D-S short	22	V
Gate-source voltage(-)			-6	V
Drain current *1	I _D	DC(T _c =60°C)	180	A
	I _{DRM}	Pulse (T _c =60°C) 1ms *2	360	A
Source current *1	I _S	T _c =60°C	180	A
	I _{SRM} *2*3	Pulse (T _c =60°C) 1ms V _{GS} =18V	360	A
		Pulse (T _c =60°C) 10μs V _{GS} =0V	360	A
Total power dissipation *4	P _{tot}	T _c =25°C	1130	W
Junction temperature	T _j		-40 to 150	°C
Storage temperature	T _{stg}		-40 to 125	°C
Isolation voltage*5	Visol	Terminals to baseplate, f=60Hz AC 1min.	2500	Vrms
Mounting torque	-	Main Terminals : M6 screw	4.5	N · m
		Mounting to heat sink : M5 screw	3.5	N · m

(*1) Measurement of T_c is to be done at the point just under the chip.

(*2) Repetition rate should be kept within the range where temperature rise of die should not exceed T_j max.

(*3) Duration of current conduction at gate-off state should not exceed 10μsec.

(*4) T_j is less than 150°C (*5) Actual measurement is 3000Vrms/1sec. in accordance with UL1557.

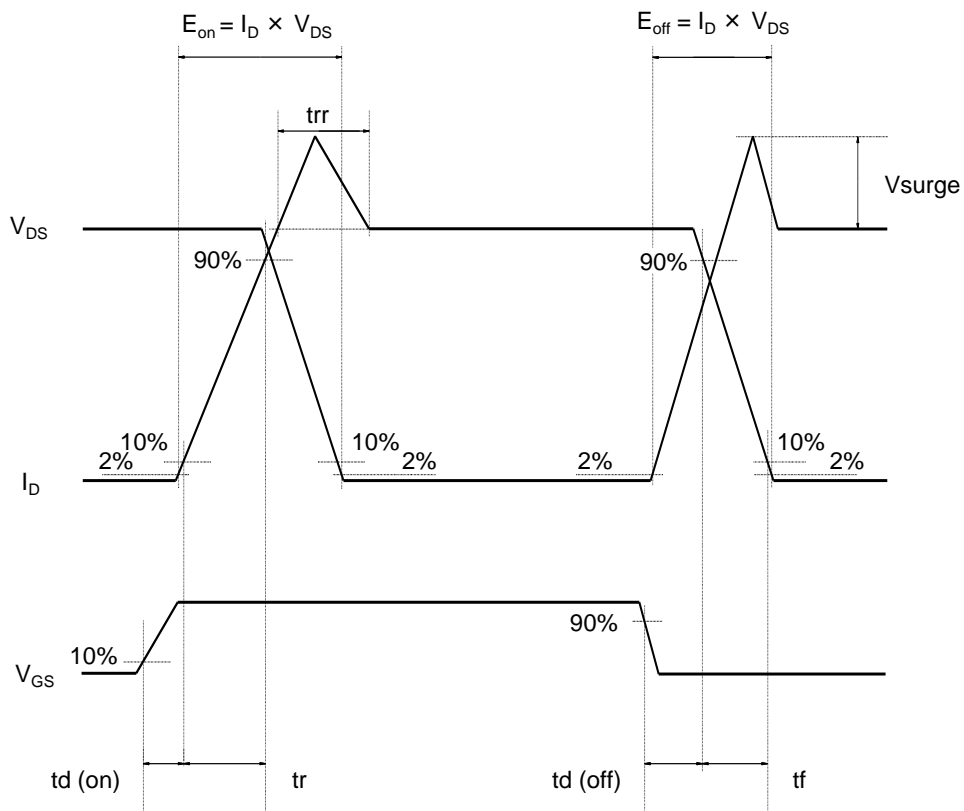
● **Electrical characteristics** (T_j=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit	
Static drain-source on-state voltage	V _{DS(on)}	I _C =180A, V _{GS} =18V	T _j =25°C	-	2.3	3.2	V
			T _j =125°C	-	3.3	4.4	V
Drain cutoff current	I _{DSS}	V _{DS} =1200V, V _{GS} =0V	-	-	10	μA	
Source-drain voltage	V _{SD}	V _{GS} =0V, I _S =180A	T _j =25°C	-	5.4	-	V
			T _j =125°C	-	5.1	-	
		V _{GS} =18V, I _S =180A	T _j =25°C	-	2.3	-	
			T _j =125°C	-	3.3	-	
Gate-source threshold voltage	V _{GS(th)}	V _{DS} =10V, I _D =35.2mA	1.6	2.7	4.0	V	
Gate-source leakage current	I _{GSS}	V _{GS} =22V, V _{DS} =0V	-	-	0.5	μA	
		V _{GS} =-6V, V _{DS} =0V	-0.5	-	-	μA	
Switching characteristics	td(on)	V _{GS(on)} =18V, V _{GS(off)} =0V	-	80	-	ns	
	tr	V _{DS} =600V	-	90	-	ns	
	trr	I _D =180A	-	50	-	ns	
	td(off)	R _G =5.6Ω	-	300	-	ns	
	tr	inductive load	-	90	-	ns	
Input capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz	-	23	-	nF	
Internal gate resistor	R _{Gint}	T _j =25°C	-	1.15	-	Ω	
Junction-to-case thermal resistance	R _{th(j-c)}	DMOS (1/2 module) *6	-	-	0.11	°C/W	
Case-to-heat sink Thermal resistance	R _{th(c-f)}	Case to heat sink, per 1 module, Thermal grease applied *7	-	0.035	-	°C/W	

(*6) Measurement of T_c is to be done at the point just beneath the chip.

(*7) Typical value is measured by using thermally conductive grease of λ=0.9W / (m · K).

●Waveform for switching test



●Electrical characteristic curves (Typical)

Fig.1 Typical Output Characteristics

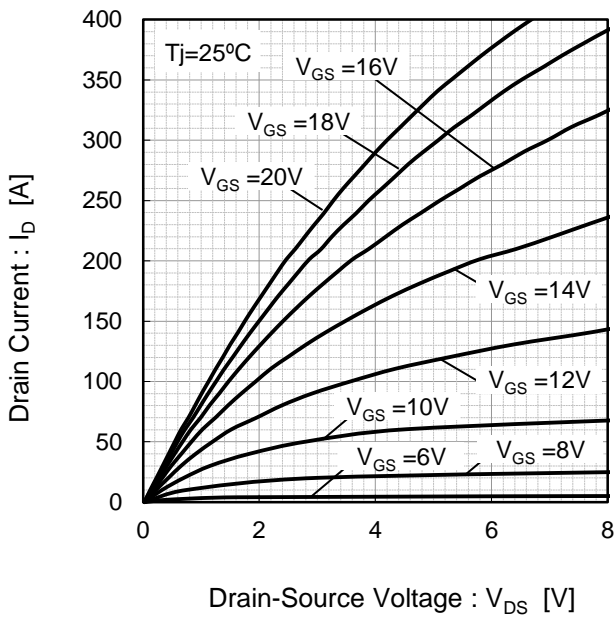


Fig.2 Drain-Source Voltage vs. Drain Current

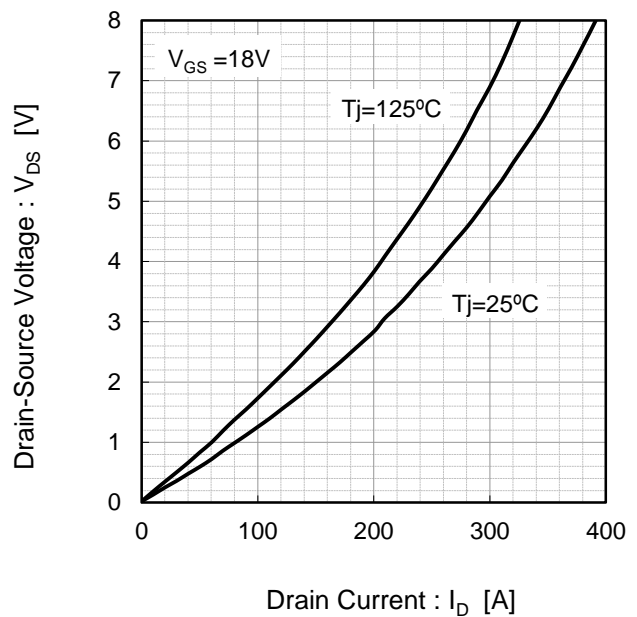


Fig.3 Drain-Source Voltage vs. Gate-Source Voltage

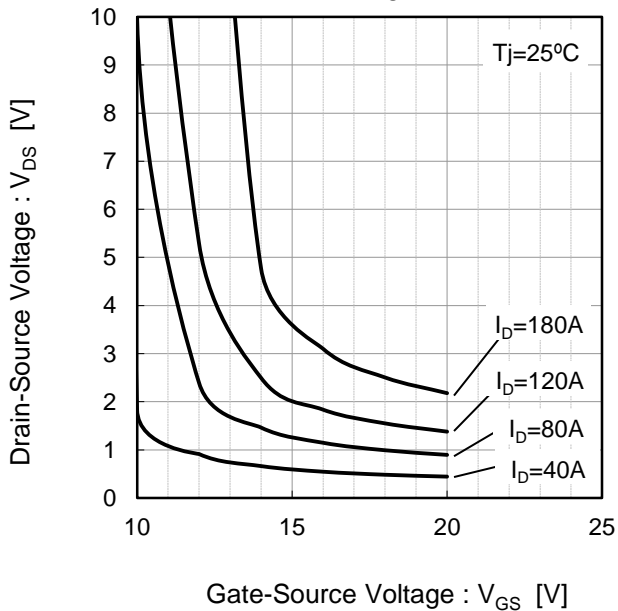
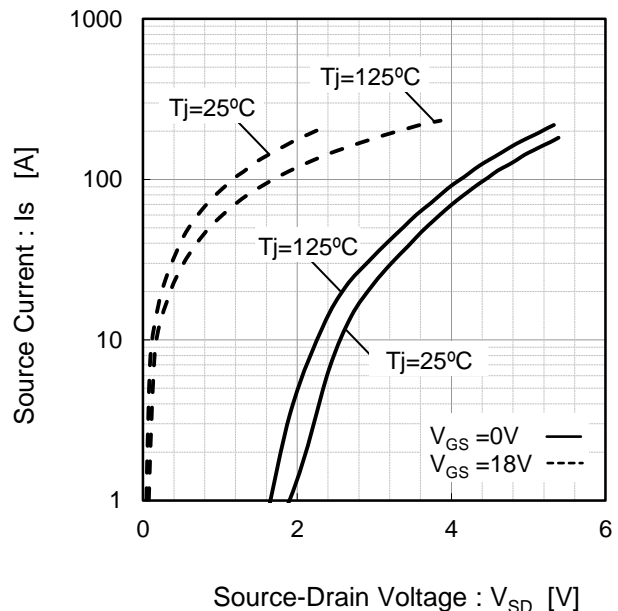


Fig.4 Forward characteristic of Diode



●Electrical characteristic curves (Typical)

Fig.5 Drain Current vs. Gate-Source Voltage

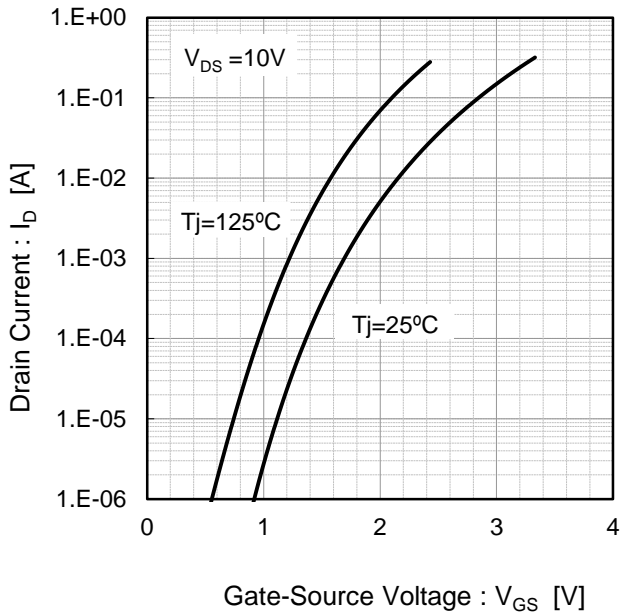


Fig.6 Drain Current vs. Gate-Source Voltage

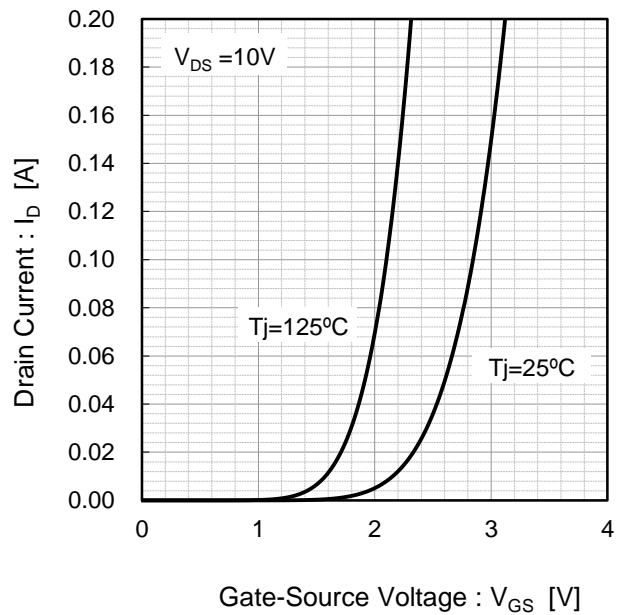


Fig.7 Switching Characteristics [$T_j = 25^\circ C$]

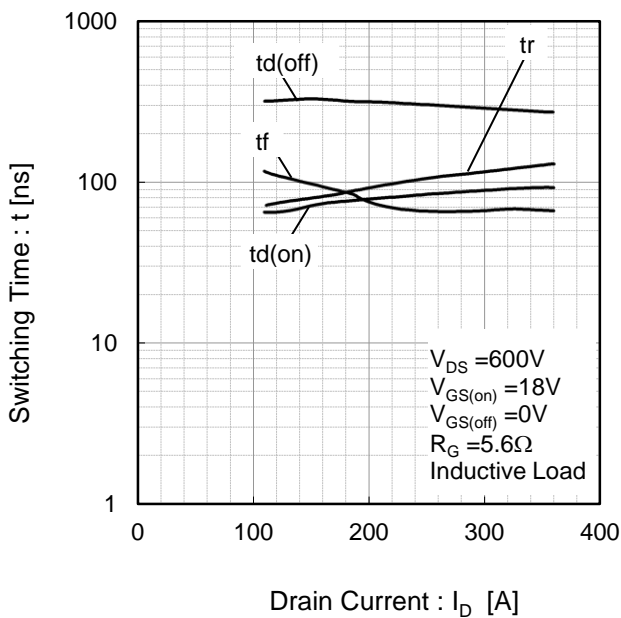
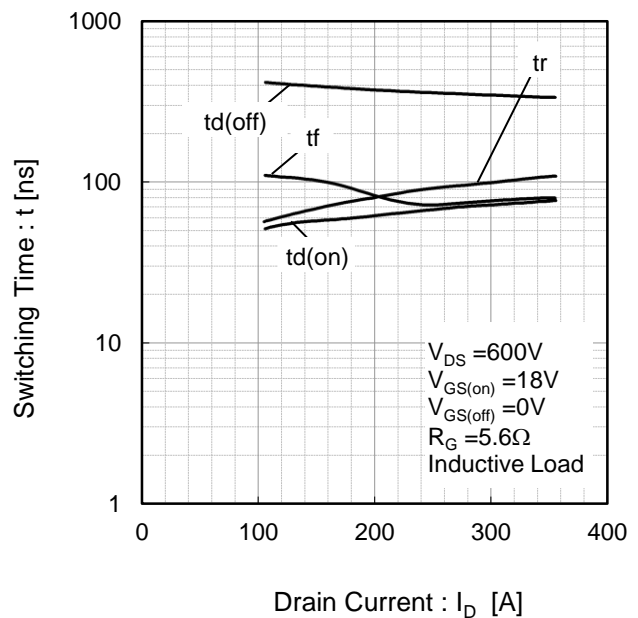


Fig.8 Switching Characteristics [$T_j = 125^\circ C$]



●Electrical characteristic curves (Typical)

Fig.9 Switching Loss vs. Drain Current [Tj=25°C]

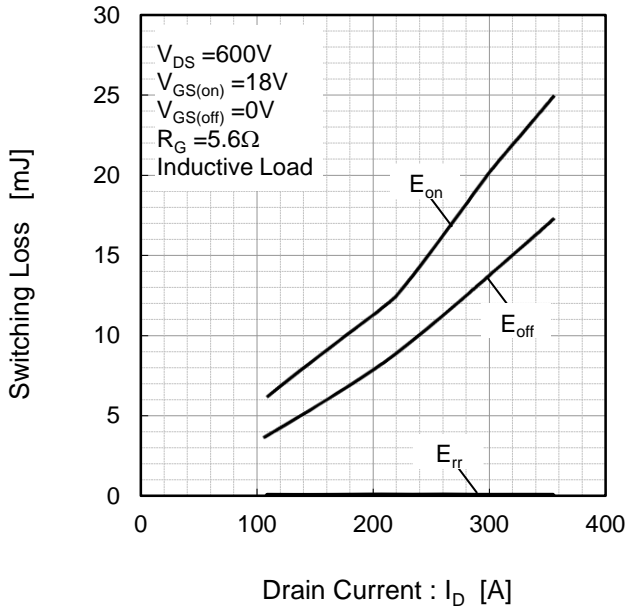


Fig.10 Switching Loss vs. Drain Current [Tj=125°C]

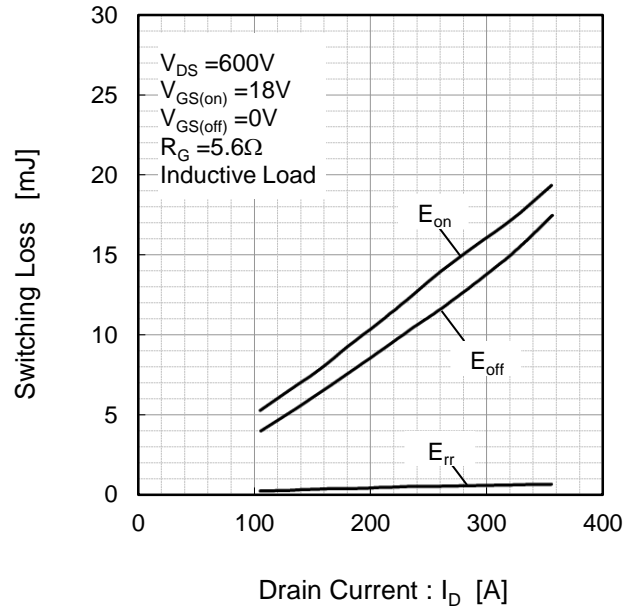


Fig.11 Recovery Characteristics vs. Drain Current [Tj=25°C]

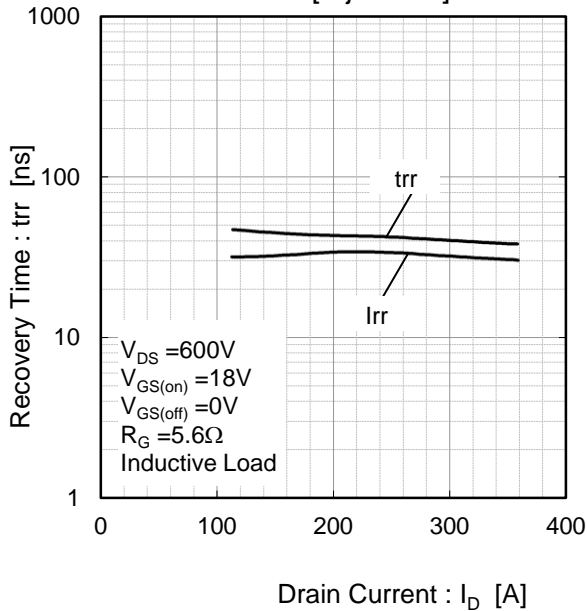
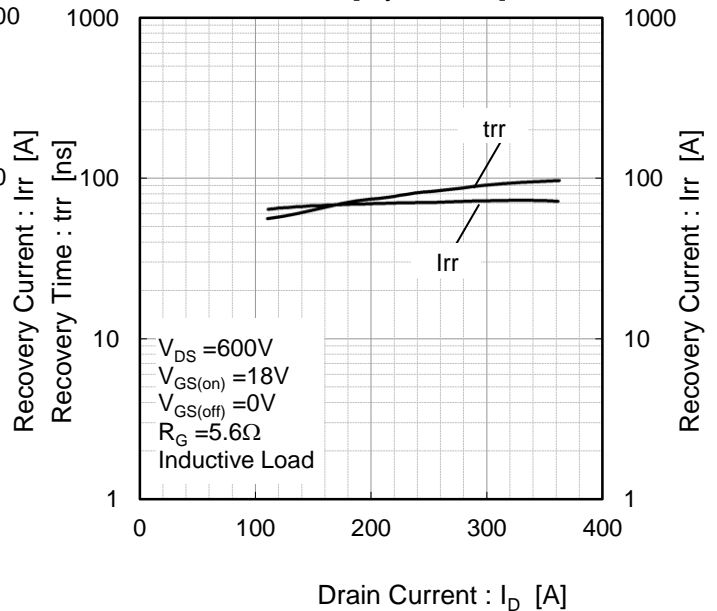


Fig.12 Recovery Characteristics vs. Drain Current [Tj=125°C]



●Electrical characteristic curves (Typical)

Fig.13 Switching Characteristics vs. Gate Resistance [Tj=25°C]

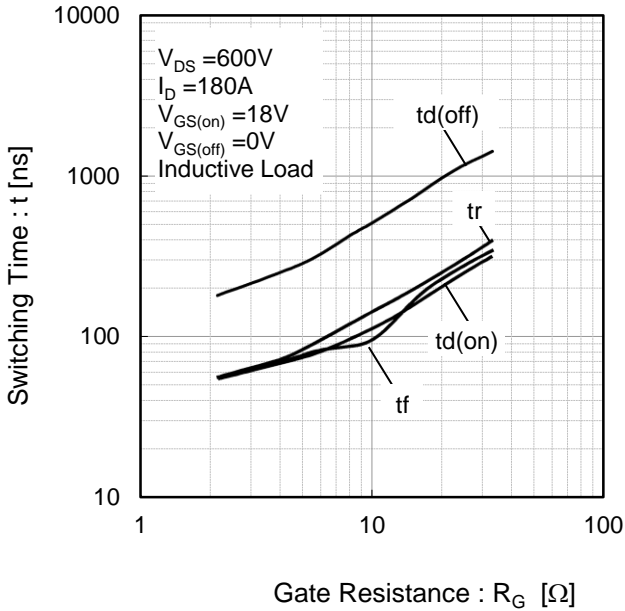


Fig.14 Switching Characteristics vs. Gate Resistance [Tj=125°C]

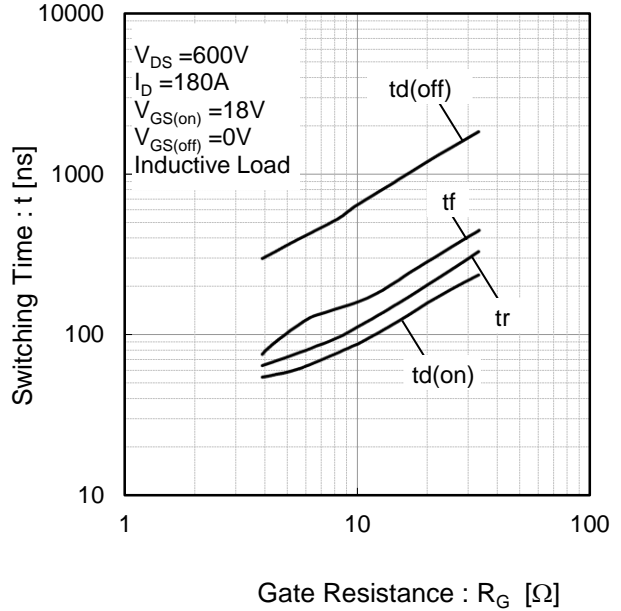


Fig.15 Switching Loss vs. Gate Resistance [Tj=25°C]

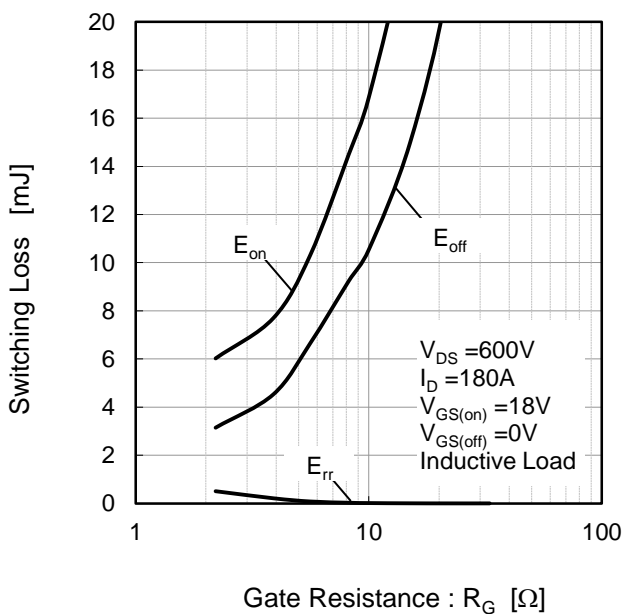
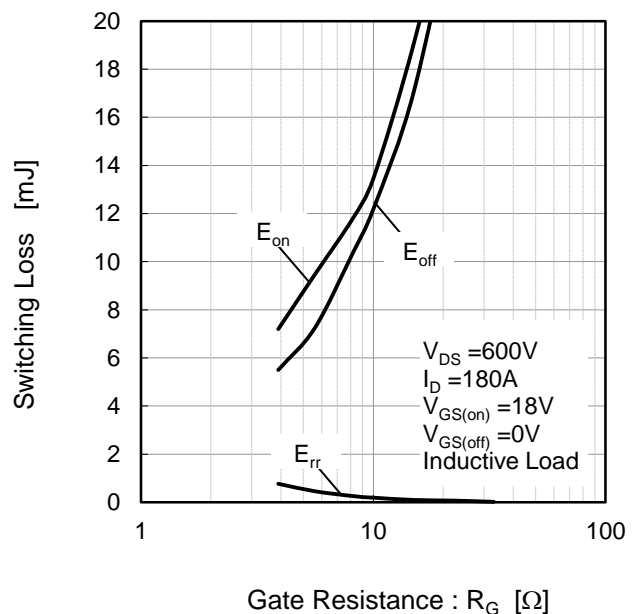


Fig.16 Switching Loss vs. Gate Resistance [Tj=125°C]



●Electrical characteristic curves (Typical)

Fig.17 Typical Capacitance vs. Drain-Source Voltage

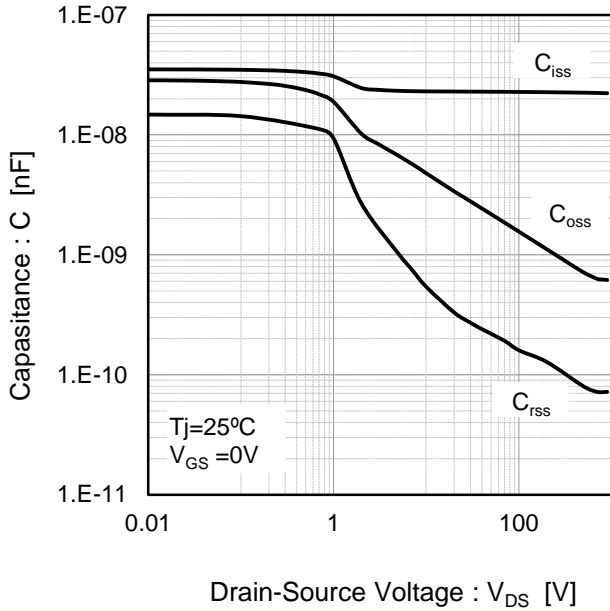


Fig.18 Gate Charge Characteristics [$T_j=25^\circ\text{C}$]

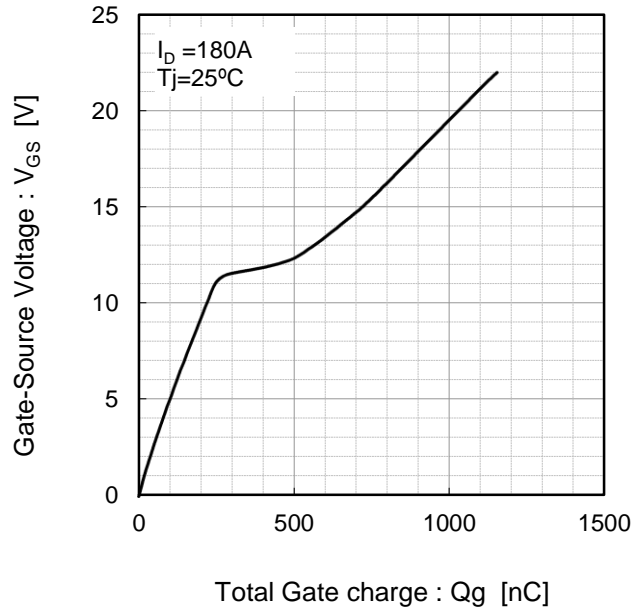


Fig.19 Normalized Transient Thermal Impedance

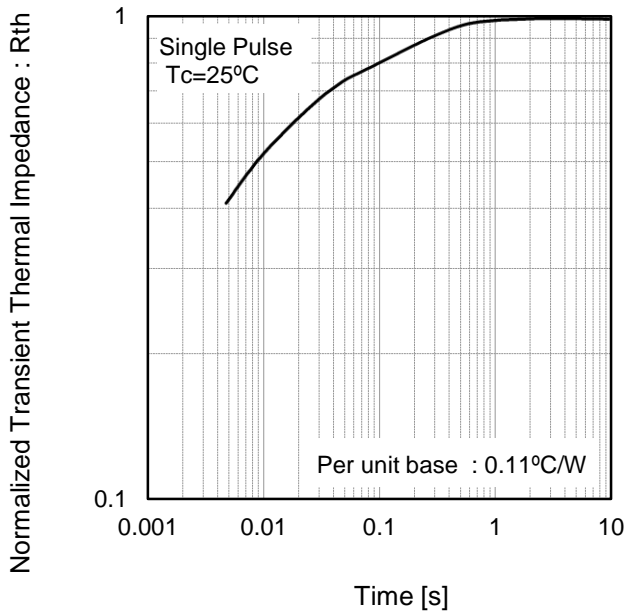
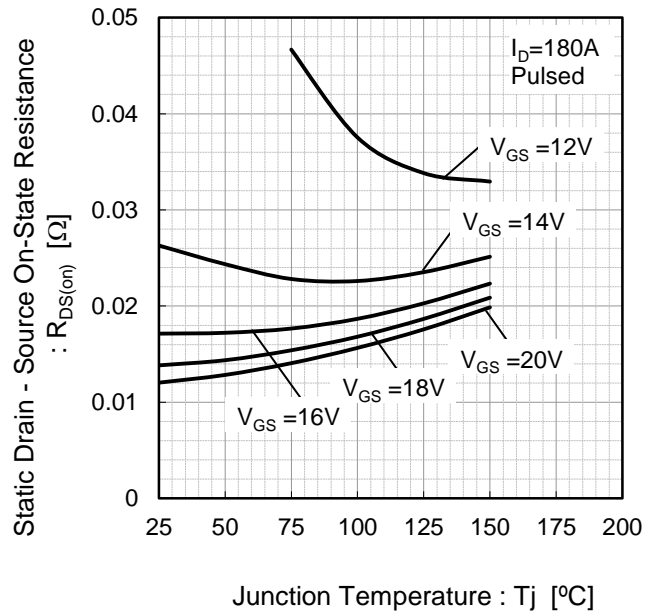


Fig.20 Static Drain - Source On-State Resistance vs. Junction Temperature



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