Descriptions

This is N-Ch SiC Power MOSFET in a TO-247 Plastic Package.

Features

- VDS=1700V
- ID=5A（Tc=25℃）
- RDS=710mΩ（VGS=15V,TJ=25℃）
- Low On-Resistance with High Blocking Voltage
- Low Capacitance
- Halogen Free, Rohs Compliant

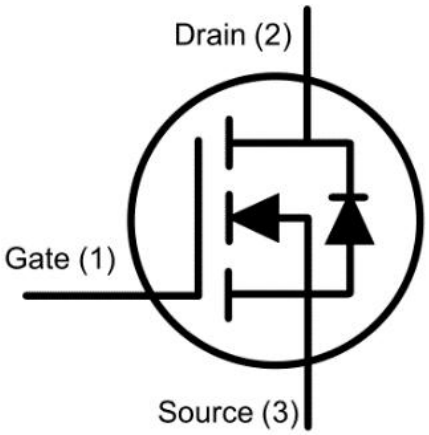
Applications

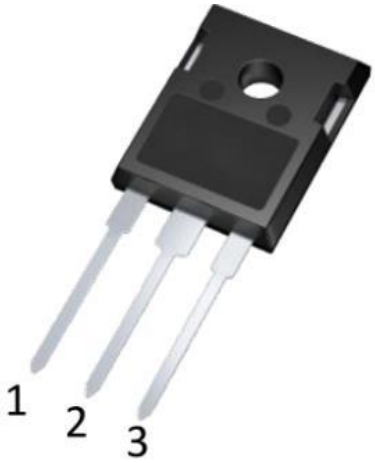
- Switch Mode Power Supplies (SMPS)
- Auxiliary power supplies
- High-voltage capacitive loads

Benefits

- High Frequency Operation
- Enabling Higher Switching Frequency
- Increased Power Density
- Reduction of Heat Sink Requirements

Schematic & PIN Configuration





Maximum Rated Valued of MOSFET

Drain-source voltage	V_{DSS}		1700	V
Recommend Gate-Source Voltage	V_{GSop}		-5/12…15	V
Gate-Source Voltage	V_{GSmax}	AC(f > 1KHz)	-10/25	V
Continuous drain current	I_D	V_{GS}=15V， Tc=100℃	3.5	A
		V_{GS}=15V， Tc=25℃	5	A
Pulsed drain current	I_{DM}	t_{Pulse} limited by Tjmax	12	A
Maximum power dissipation	P_{tot}	Tc=25℃， T_J =150℃	70	W
Operating Junction Temperature	Tj		-55~150	℃
Storage Temperature	T_{stg}		-55~150	℃

Thermal Characteristic

Thermal resistance, junction-to-case	$R_{\theta JC}$		1.78	℃/W
Thermal resistance, junction-to-ambient	$R_{\theta JA}$		62.5	℃/W

Electrical Characteristics of MOSFET

Drain-Source breakdown voltage	V(BR)DSS	ID=250uA, VGS=0V	TJ=25℃	1700	-	-	V
Gate threshold voltage	VGS(th)	ID=5mA, VDS=VGS	TJ=25℃ TJ=150℃	2.0 -	2.9 2.0	4.0 -	V
Zero gate voltage drain current	IDSS	VDS=1700V, VGS=0V	TJ=25℃	-	-	100	uA
Gate-Source leakage current	IGSSF	VDS=0V, VGS=20V	TJ=25℃	-	-	200	nA
	IGSSR	VDS=0V, VGS=-4V	TJ=25℃	-	-	-200	nA
Drain-Source On-State resistance	RDS(ON)	VGS=15V, ID=2A	TJ=25℃	-	710	850	mΩ
			TJ=150℃	-	1010	-	mΩ
		VGS=12V, ID=2A	TJ=25℃	-	1040	1200	mΩ
			TJ=150℃	-	1230	-	mΩ
Transconductance	gfs	VDS=20V, ID=2A	TJ=25℃	-	7.3	-	S
Internal gate resistance	RGint	f=1MHz, VAC=25mV	TJ=25℃	-	20	-	Ω
Input capacitance	Ciss	f=1MHz, VDS=1000V, VGS=0V, VAC=25mV	TJ=25℃	-	380	-	pF
Output capacitance	Coss		TJ=25℃	-	14	-	pF
Reverse transfer capacitance	Crss		TJ=25℃	-	3.2	-	pF
Gate to source charge	QGS	VDS=800V IDS=2A VGS= -5V/20V	TJ=25℃	-	4.8	-	nC
Gate to drain charge	QGD		TJ=25℃	-	5.6	-	nC
Total gate charge	QG		TJ=25℃	-	13	-	nC
Turn-on delay time	td on	VDS=1200V, IDS=2A, RG-ext=2.5Ω, VGS=-5V/20V,	TJ=25℃	-	6	-	ns
Rise time	tr		TJ=25℃	-	9.5	-	ns
Turn-off delay time	td off		TJ=25℃	-	14	-	ns
Fall time	tf		TJ=25℃	-	23	-	ns
Turn-on energy loss per pulse	Eon		TJ=25℃	-	37	-	uJ
Turn-off energy loss per pulse	Eoff		TJ=25℃	-	15	-	uJ

Characteristics of Body Diode

Forward voltage	V_{SD}	I_{SD}=1A, V_{GS}=-4V	T_J=25℃	-	3.5	-	V
Continuous diode forward current	I_S		T_J=25℃	-	-	4	A
Peak reverse recovery current	I_{RM}	V_R=1200V, I_{SD}=2A, V_{GS}=-5V -di/dt=1200A/us	T_J=150℃	-	3.5	-	A
Reverse recovery time	t_{rr}		T_J=150℃	-	22	-	ns
Recovery charge	Q_{rr}		T_J=150℃	-	31	-	nC

Typical Characteristics

Fig.1 Typical Forward Output Characteristics at T_J=25°C

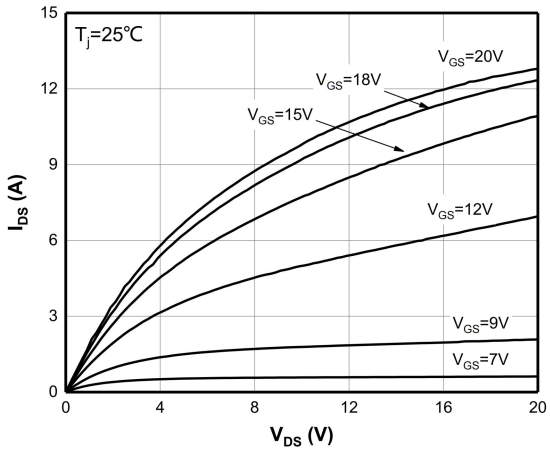


Fig.2 Typical Forward Output Characteristics at T_J =150 ℃

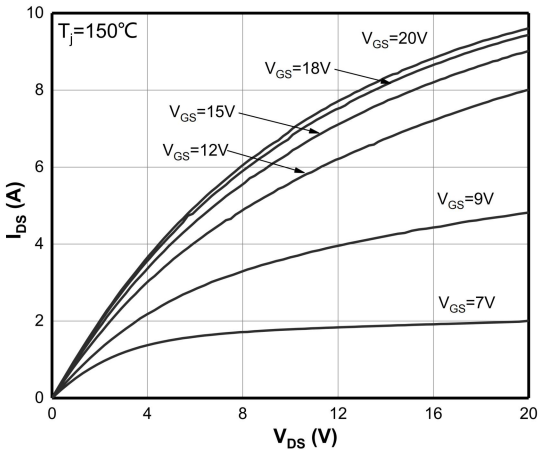


Fig.3 Transfer Characteristics for Various Temperature

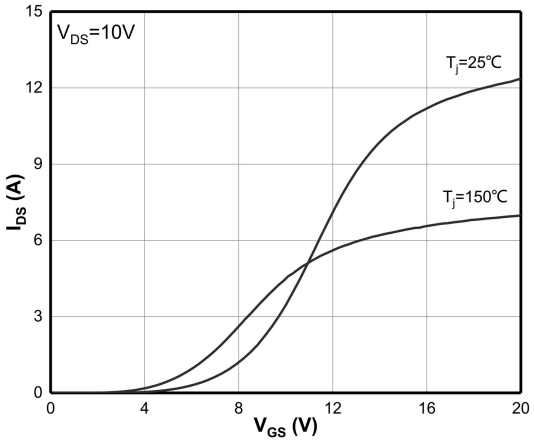


Fig.4 Threshold Voltage for Various Temperature

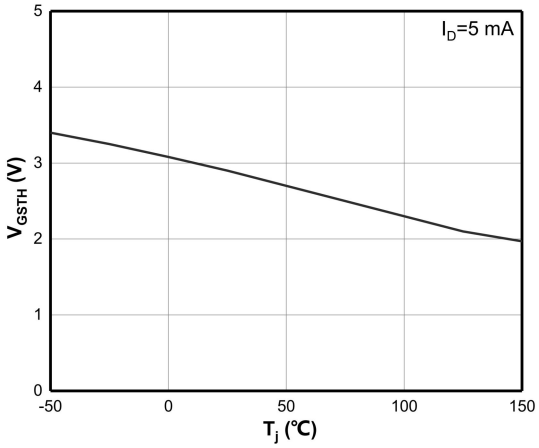


Fig.5 Normalized On-Resistance vs. Temperature for Various Gate Voltage

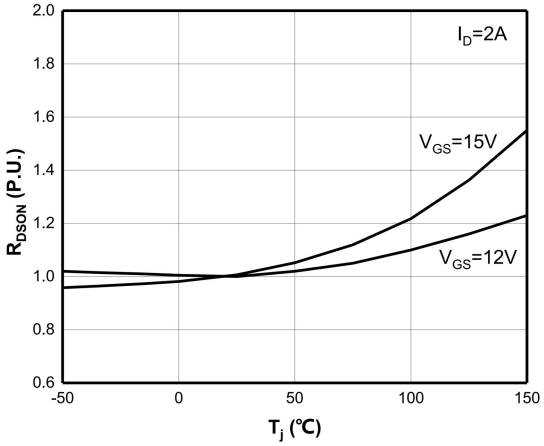
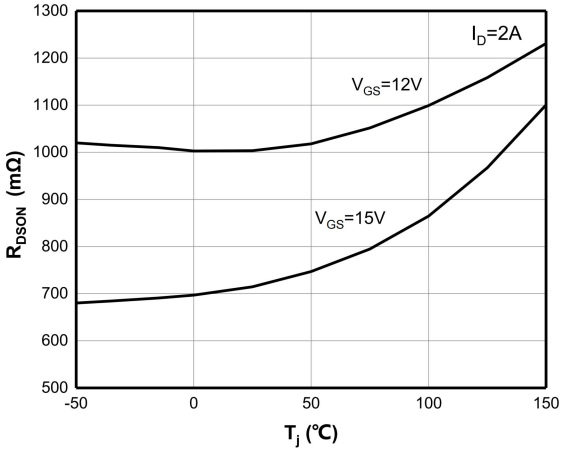


Fig.6 On-Resistance vs. Temperature for Various Gate Voltage



Typical Characteristics

Fig.7 Breakdown Voltage vs. Temperature

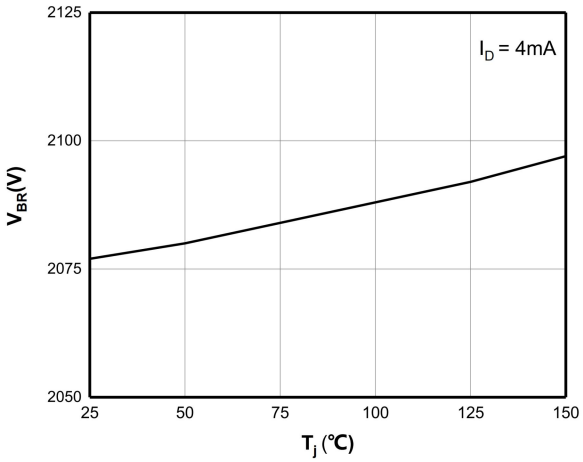


Fig.8 Body Diode Characteristics

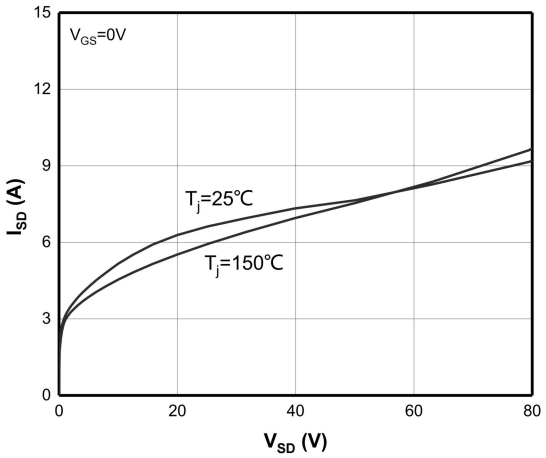


Fig.9 Capacitance vs. Drain-Source Voltage

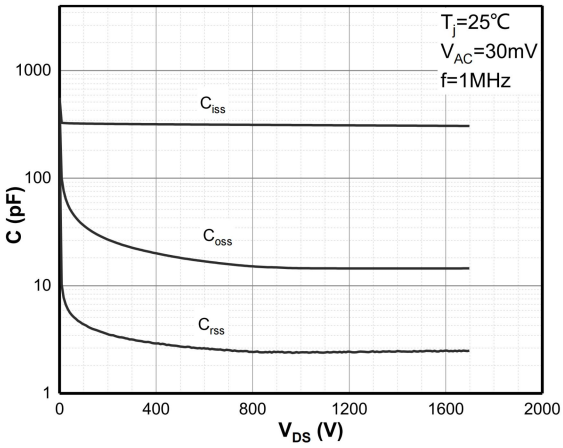


Fig.10 Gate Charge Characteristics

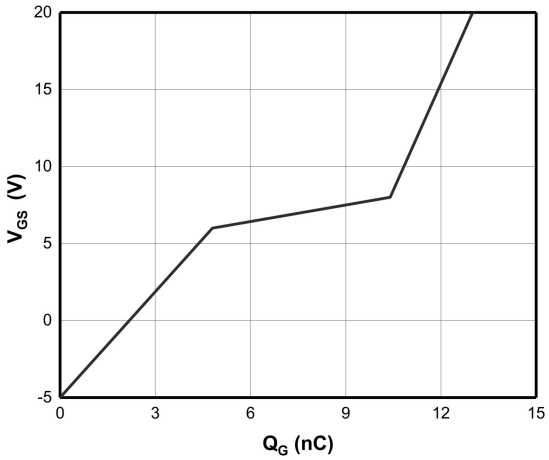


Fig.11 Continuous Drain Current Derating vs. Case Temperature

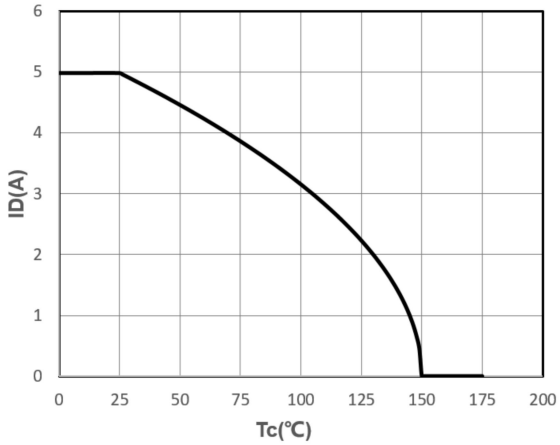
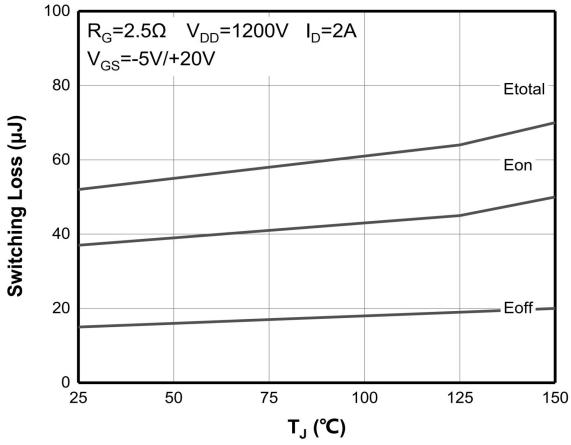


Fig.12 Clamped inductive switching energy vs. temperature



Typical Characteristics

Fig.13 Clamped Inductive Switching Energy vs. External Gate Resistance

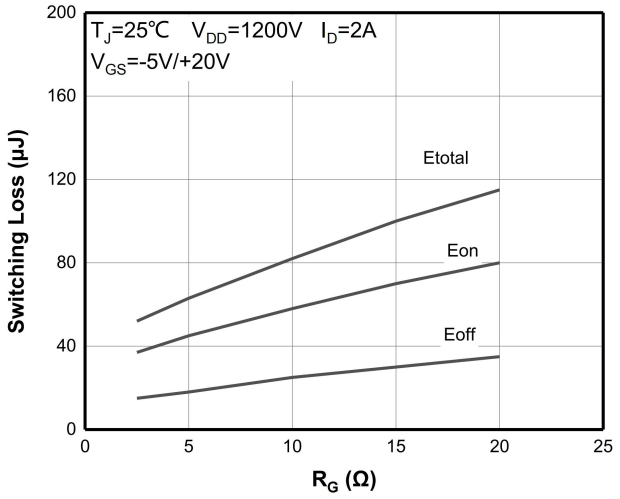


Fig.14 Safe Operating Area

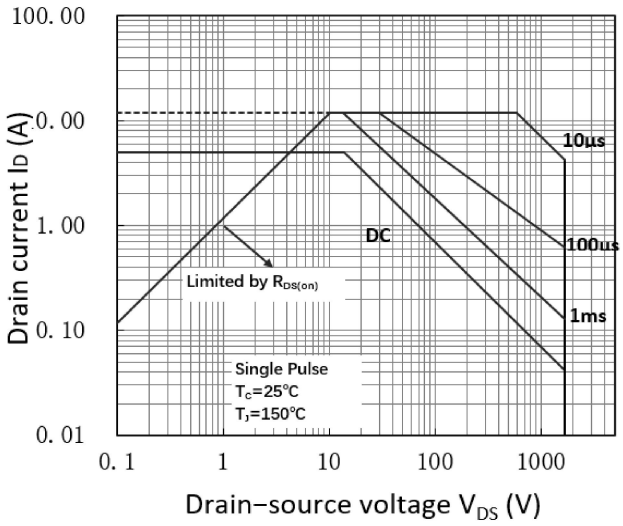
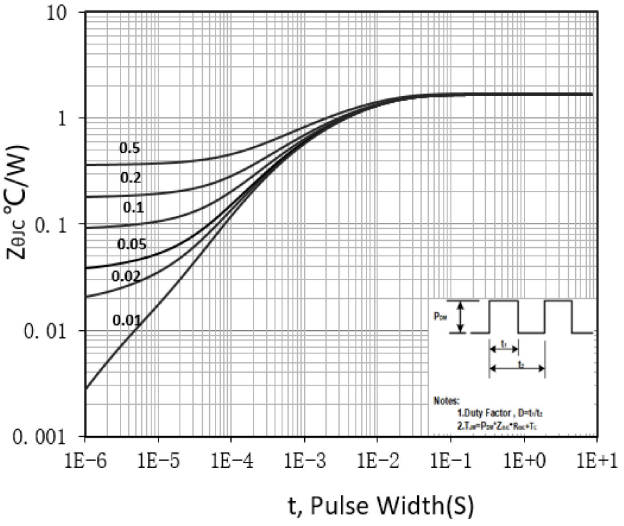


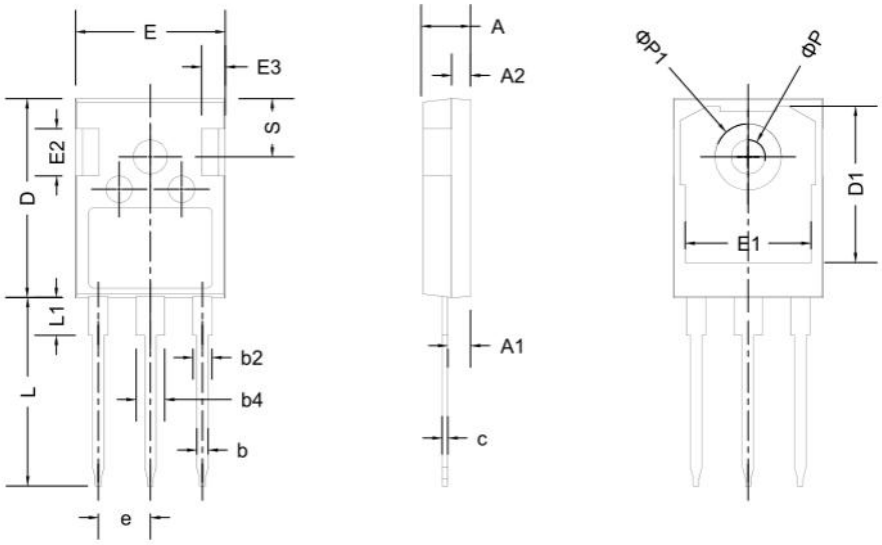
Fig.15 Transient Thermal Impedance (Junction – Case)



Ordering Information

Part	Package	Marking	Packing method
CTCM01KJ170T2C	TO-247	1KJ170T2C	Tube

Package Information



SYMBOL	mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.80	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44 BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
ϕ P	3.40	3.60	3.80
ϕ P1	-	-	7.30
S	6.16 BSC		