

## Descriptions

This is N-Ch SiC Power MOSFET in a TO-247-4 Plastic Package.

## Features

- VDS=650V
- ID=60A (Tc=25°C)
- RDS=35mΩ (VGS=18V,TJ=25°C)
- Low On-Resistance with High Blocking Voltage
- High Speed Switching with Low Capacitance
- Avalanche Ruggedness
- Halogen Free, Rohs Compliant

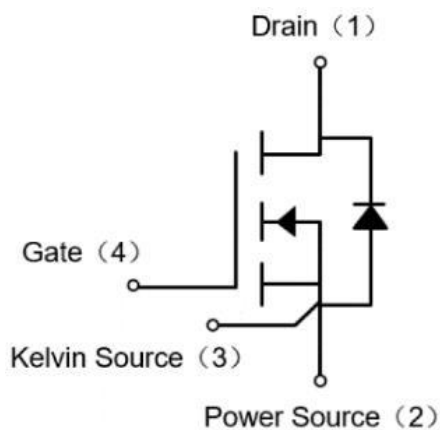
## Applications

- Switch Mode Power Supplies (SMPS)
- Pulsed Power applications
- Motor Drivers & Battery Chargers
- High Voltage DC/DC Converter

## Benefits

- High Switching Frequency Operation
- High System Efficiency
- Increased Power Density
- Reduction of Heat Sink Requirements

## Schematic & PIN Configuration



## Maximum Rated Valued of MOSFET

Drain-source voltage	$V_{DSS}$		650	V
Recommend Gate-Source Voltage	$V_{GSop}$		-5/18	V
Gate-Source Voltage	$V_{GSmax}$		-8/20	V
Continuous drain current	$I_D$	$T_C=100^{\circ}C, V_{GS}=20V$	40	A
		$T_C=25^{\circ}C, V_{GS}=20V$	60	
Pulsed drain current	$I_{DM}$	$t_{Pulse}$ limited by $T_{Jmax}$	130	A
Maximum power dissipation	$P_{tot}$	$T_C=25^{\circ}C, T_J=175^{\circ}C$	273	W
Operating Junction Temperature	$T_J$		-55~175	$^{\circ}C$
Storage Temperature	$T_{stg}$		-55~175	$^{\circ}C$

## Thermal Characteristic

Thermal resistance, junction-to-case	$R_{\theta JC}$		0.55	$^{\circ}C/W$
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### Electrical Characteristics of MOSFET

Drain-Source breakdown voltage	V(BR) <sub>DS</sub>	ID=100μA, VGS=0V	TJ=25°C	650	-	-	V
Gate threshold voltage	VGS(th)	ID=10mA, VDS=VGS	TJ=25°C	2.3	-	3.8	V
Zero gate voltage drain current	IDSS	VDS=650V, VGS=0V	TJ=25°C	-	1	100	μA
Gate-Source leakage current	IGSS	VDS=0V, VGS=20V	TJ=25°C	-	-	200	nA
Drain-Source On-State resistance	RDS(ON)	VGS=18V, ID=20A	TJ=25°C	-	32	55	mΩ
			TJ=150°C	-	36	-	mΩ
Transconductance	Gfs	VDS=20V, ID=20A	TJ=25°C	-	9.4	-	S
Internal gate resistor	RGint	f=1MHz, VAC=30mV	TJ=25°C	-	1.5	-	Ω
Input capacitance	Ciss	f=1MHz, VDS=400V, VAC=30mV, VGS=0V	TJ=25°C	-	2900	-	pF
Output capacitance	Coss			-	225	-	pF
Reverse transfer capacitance	Crss			-	6.7	-	pF
Gate to source charge	QGS	VDS=400V	TJ=25°C	-	30	-	nC
Gate to drain charge	QGD	IDS=20A		-	20	-	nC
Total gate charge	QG	VGS= -5V/18V		-	70	-	nC
Turn-on delay time	td on	VDS=400V, IDS=20A, RG-ext=5Ω, VGS=-5V/18V,	TJ=25°C	-	15	-	ns
Rise time	tr		TJ=25°C	-	45	-	ns
Turn-off delay time	td off		TJ=25°C	-	13	-	ns
Fall time	tf		TJ=25°C	-	10	-	ns
Turn-on energy loss per pulse	Eon		TJ=25°C	-	1.6	-	μJ
Turn-off energy loss per pulse	Eoff		TJ=25°C	-	0.8	-	μJ

### Characteristics of Body Diode

Forward voltage	VSD	ISD=15A, VGS=-5V	TJ=25°C	-	3.6	-	V
Continuous diode forward current	IS	VGS=0V	TJ=25°C	-	60	-	A
Peak reverse recovery current	IRM	VDS=400V, ISD=15A, VGS=-5V -di/dt=1200A/μs	TJ=150°C	-	10	-	A
Reverse recovery time	trr		TJ=150°C	-	30	-	ns
Recovery charge	Qrr		TJ=150°C	-	120	-	nC

Typical Characteristics

Fig.1 Typical Forward Output Characteristics at  $T_J=25^\circ\text{C}$

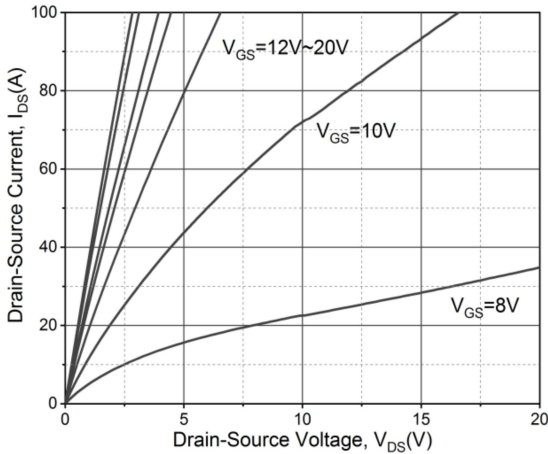


Fig.2 Typical Forward Output Characteristics at  $T_J = 150^\circ\text{C}$

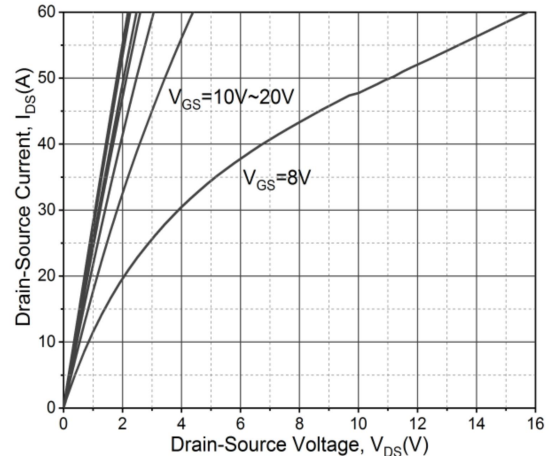


Fig.3 On-Resistance For Various Gate Voltage

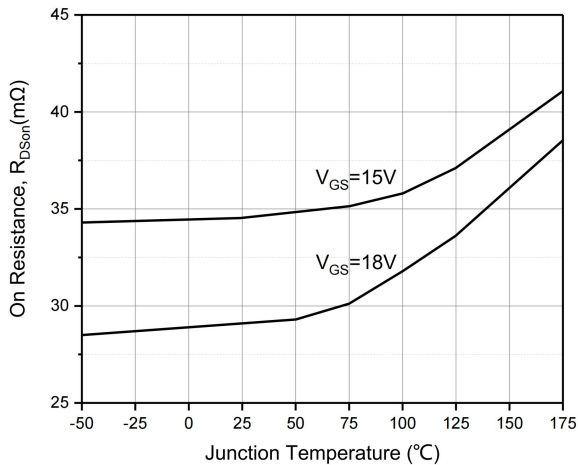


Fig.4 Threshold Voltage vs. Temperature

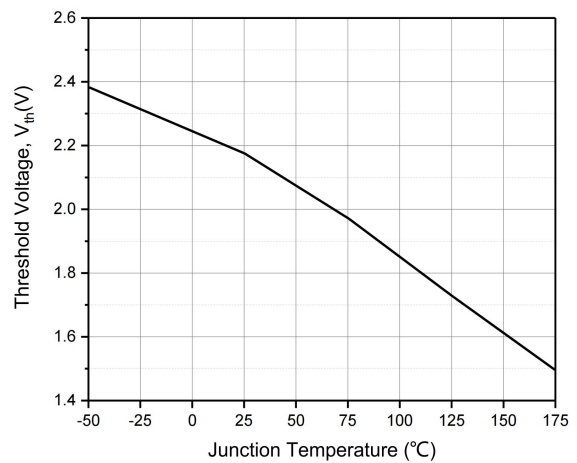


Fig.5 Body Diode Characteristics at  $T_J = 25^\circ\text{C}$

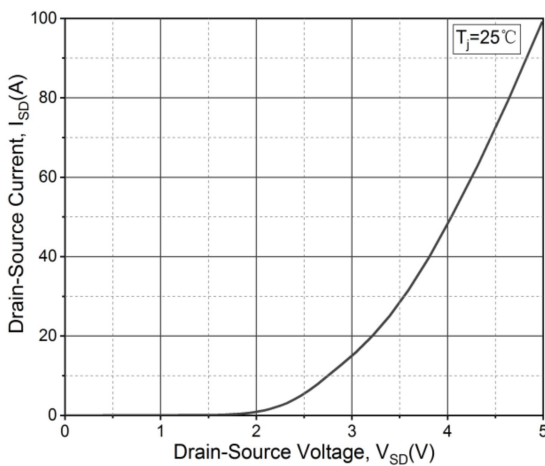
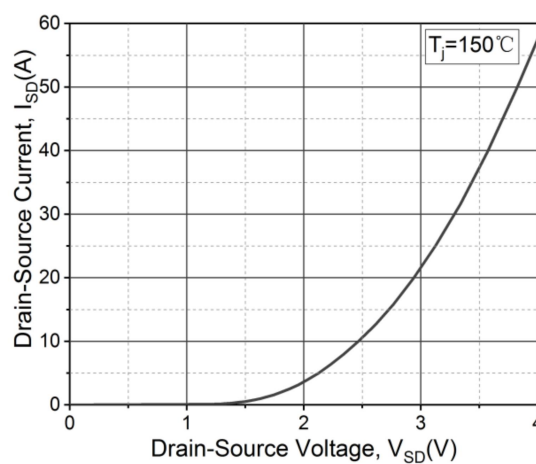


Fig.6 Body Diode Characteristics at  $T_J = 150^\circ\text{C}$



Typical Characteristics

Fig.7 Transfer Characteristic for Various Junction Temperatures

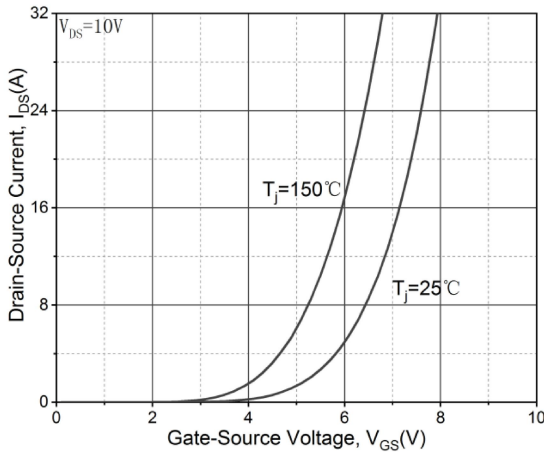


Fig.8 Maximum Power Dissipation Derating vs. Case Temperature

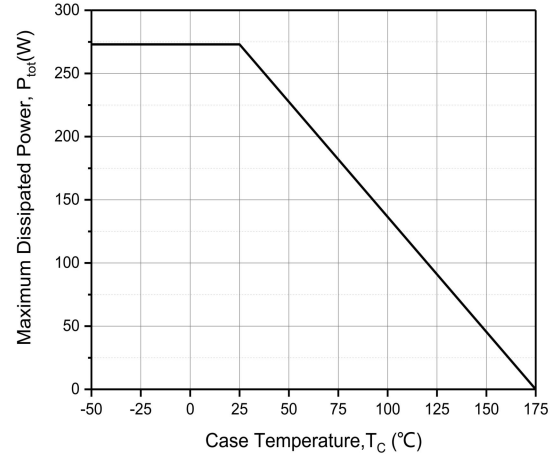


Fig.9 Capacitance vs. Drain-Source Voltage (0 - 650V)

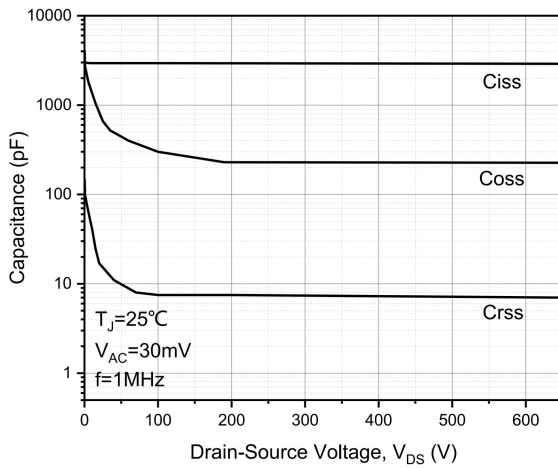


Fig.10 Gate Charge Characteristics

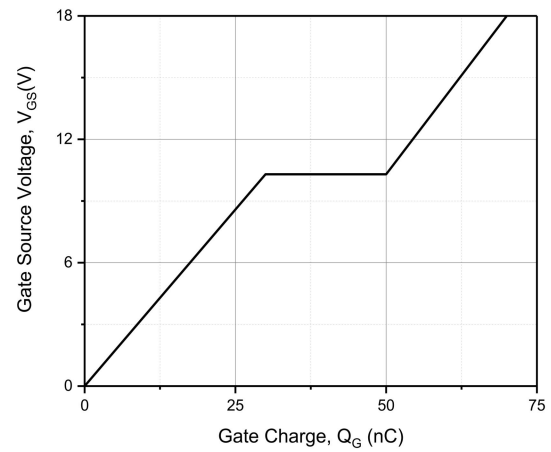


Fig.11 Transient Thermal Impedance (Junction – Case)

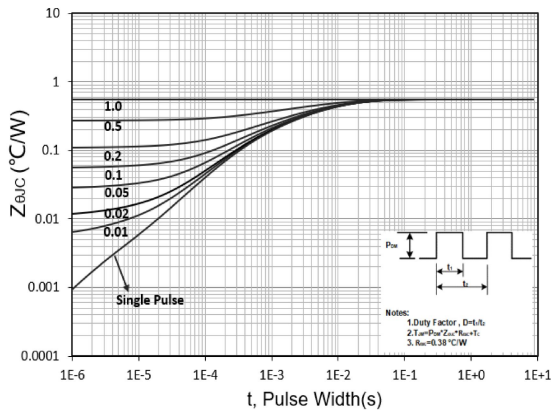
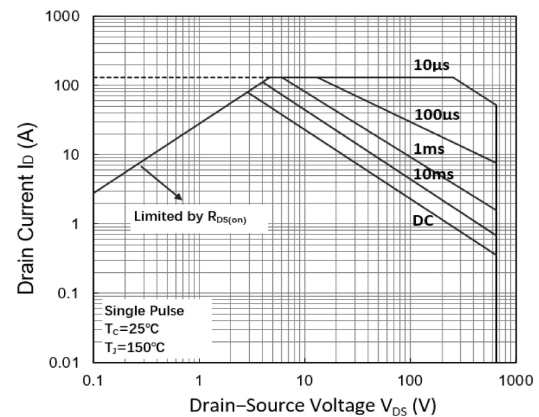


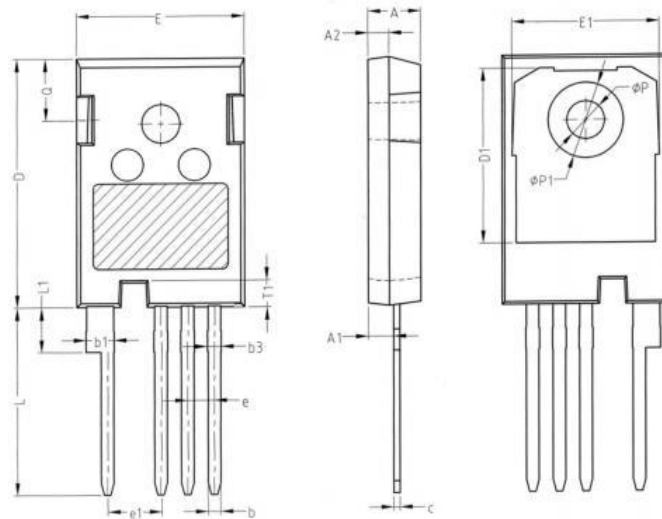
Fig.12 Safe Operating Area



**Ordering Information**

Part	Package	Marking	Packing method
CTCM035R65T2C	TO-247-4	35R65T2C	Tube

**Package Information**



SYMBOL	MM		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.80	2.00	2.20
b	1.06	1.21	1.36
b1	2.33	2.63	2.93
b3	1.07	1.30	1.60
c	0.51	0.61	0.75
D	23.30	23.45	23.60
D1	16.25	16.55	16.85
E	15.74	15.94	16.14
E1	13.72	14.02	14.32
T1	2.35	2.50	2.65
e	2.54 BSC		
e1	5.08 BSC		
Q	5.49	5.79	6.09
L	17.27	17.57	17.87
L1	3.99	4.19	4.39
Φ <sub>p</sub>	3.40	3.60	3.80
Φ <sub>p1</sub>	7.19 REF		