

## Descriptions

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

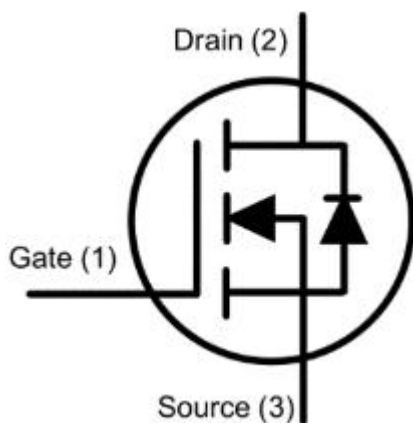
## Applications

- 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	$V_{(BR)DSS}$	$I_D=100\mu A, V_{GS}=0V$	$T_J=25^\circ C$	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=10mA, V_{DS}=V_{GS}$	$T_J=25^\circ C$	2..3	-	3.8	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V$	$T_J=25^\circ C$	-	1	100	$\mu A$
Gate-Source leakage current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=20V$	$T_J=25^\circ C$	-	-	200	nA
Drain-Source On-State resistance	$R_{DS(on)}$	$V_{GS}=18V, I_D=20A$	$T_J=25^\circ C$	-	35	55	m $\Omega$
			$T_J=150^\circ C$	-	50	-	m $\Omega$
Transconductance	$G_{fs}$	$V_{DS}=20V, I_D=20A$	$T_J=25^\circ C$	-	9.4	-	S
Internal gate resistor	$R_{Gint}$	$f=1MHz, V_{AC}=30mV$	$T_J=25^\circ C$	-	1.5	-	$\Omega$
Input capacitance	$C_{iss}$	$f=1MHz, V_{DS}=400V, V_{AC}=30mV, V_{GS}=0V$	$T_J=25^\circ C$	-	2900	-	pF
Output capacitance	$C_{oss}$			-	225	-	pF
Reverse transfer capacitance	$C_{rss}$			-	6.7	-	pF
Gate to source charge	$Q_{GS}$	$V_{DS}=400V, I_{DS}=20A, V_{GS}=-5V/18V$	$T_J=25^\circ C$	-	30	-	nC
Gate to drain charge	$Q_{GD}$			-	20	-	nC
Total gate charge	$Q_G$			-	70	-	nC
Turn-on delay time	$t_{d on}$	$V_{DS}=400V, I_{DS}=20A, R_{G-ext}=5\Omega, V_{GS}=-5V/18V,$	$T_J=25^\circ C$	-	15	-	ns
Rise time	$t_r$		$T_J=25^\circ C$	-	45	-	ns
Turn-off delay time	$t_{d off}$		$T_J=25^\circ C$	-	13	-	ns
Fall time	$t_f$		$T_J=25^\circ C$	-	10	-	ns
Turn-on energy loss per pulse	$E_{on}$		$T_J=25^\circ C$	-	1.6	-	$\mu J$
Turn-off energy loss per pulse	$E_{off}$		$T_J=25^\circ C$	-	0.8	-	$\mu J$

### Characteristics of Body Diode

Forward voltage	$V_{SD}$	$I_{SD}=15A, V_{GS}=-5V$	$T_J=25^\circ C$	-	3.6	-	V
Continuous diode forward current	$I_S$	$V_{GS}=0V$	$T_J=25^\circ C$	-	60	-	A
Peak reverse recovery current	$I_{RM}$	$V_{DS}=400V, I_{SD}=15A, V_{GS}=-5V, -di/dt=1200A/\mu s$	$T_J=150^\circ C$	-	10	-	A
Reverse recovery time	$t_{rr}$		$T_J=150^\circ C$	-	30	-	ns
Recovery charge	$Q_{rr}$		$T_J=150^\circ C$	-	120	-	nC

Typical Characteristics

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

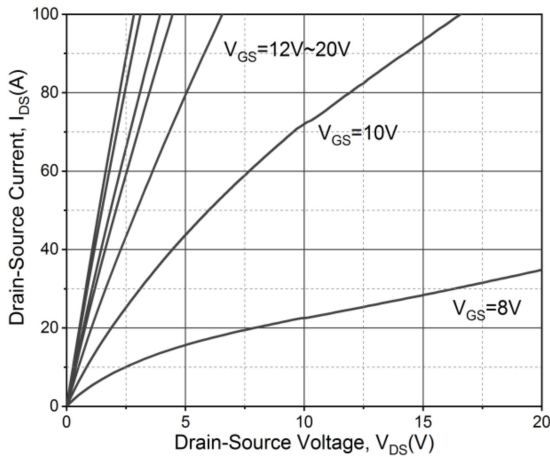


Fig.2 Typical Forward Output Characteristics at  $T_J=150^\circ\text{C}$

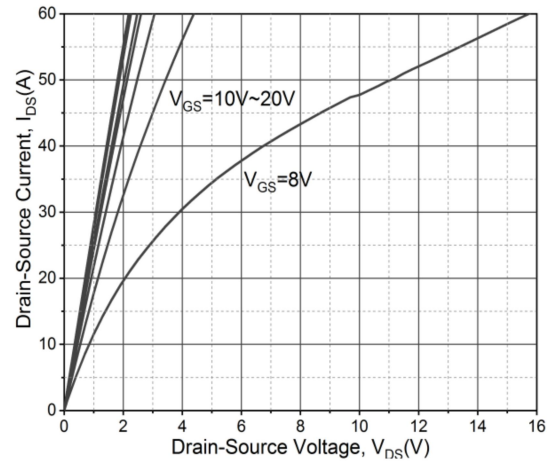


Fig.3 On-Resistance For Various Gate Voltage

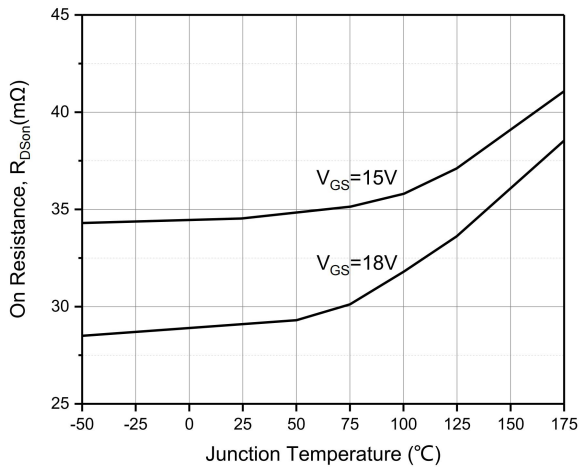


Fig.4 Threshold Voltage vs. Temperature

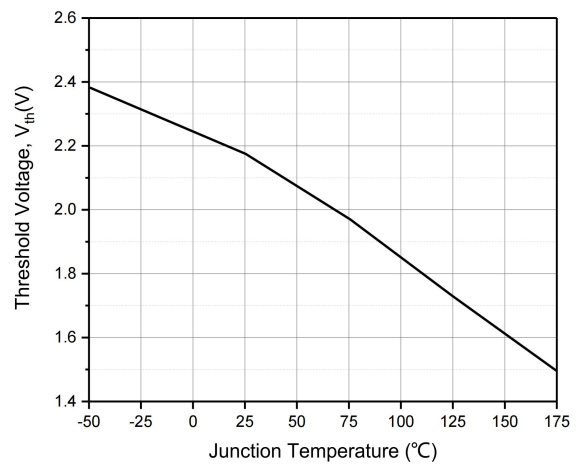


Fig.5 Body Diode Characteristics at  $T_J=25^\circ\text{C}$

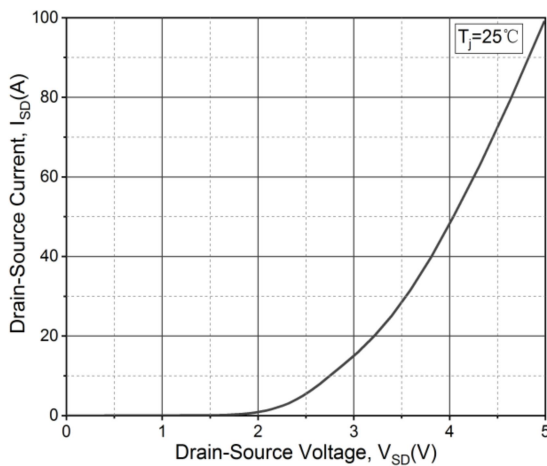
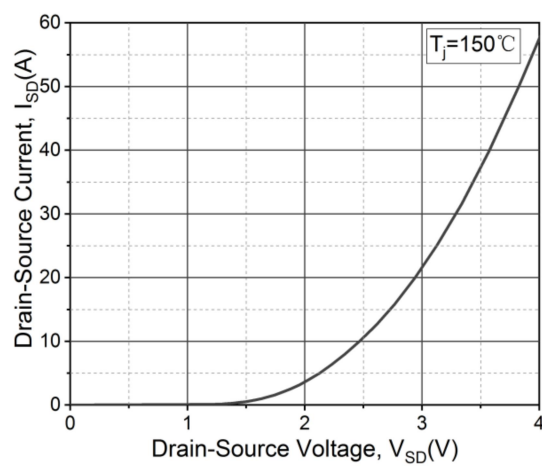


Fig.6 Body Diode Characteristics at  $T_J=150^\circ\text{C}$



Typical Characteristics

Fig.7 Transfer Characteristic for Various Junction Temperatures

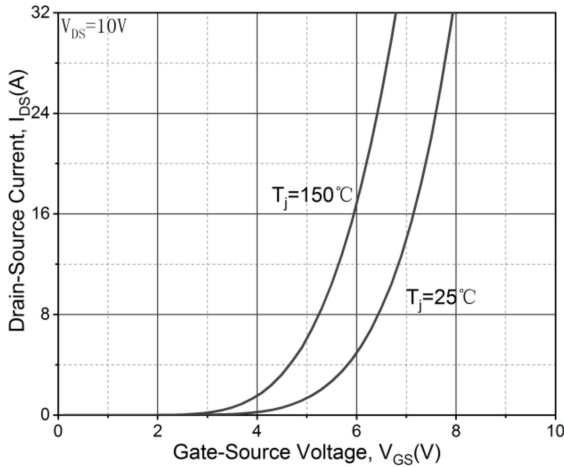


Fig.9 Capacitance vs. Drain-Source Voltage (0 - 650V)

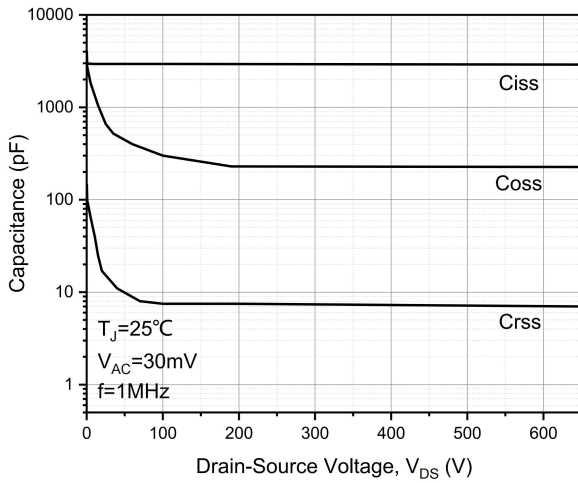


Fig.11 Transient Thermal Impedance (Junction – Case)

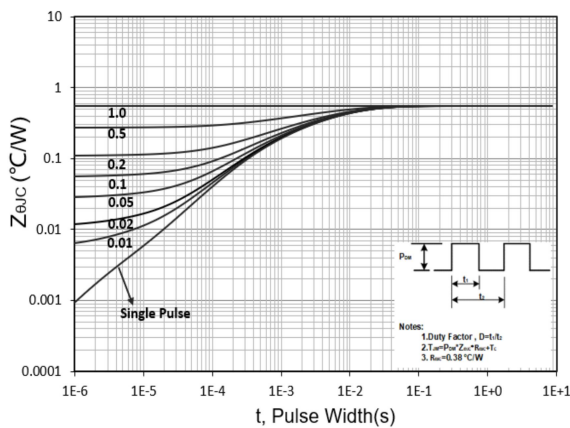


Fig.8 Maximum Power Dissipation Derating vs. Case Temperature

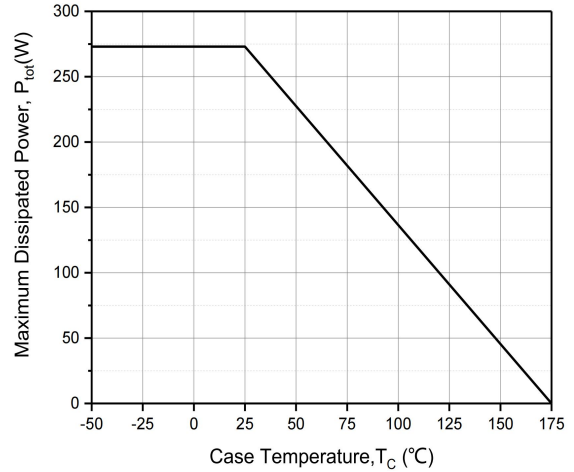


Fig.10 Gate Charge Characteristics

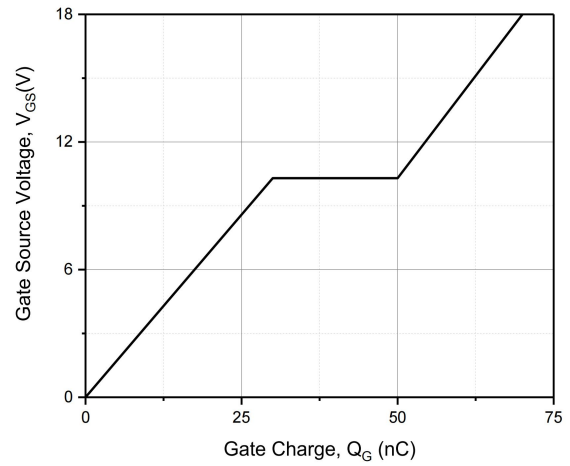
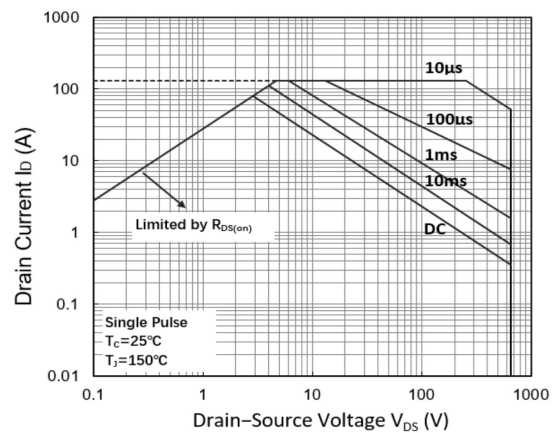


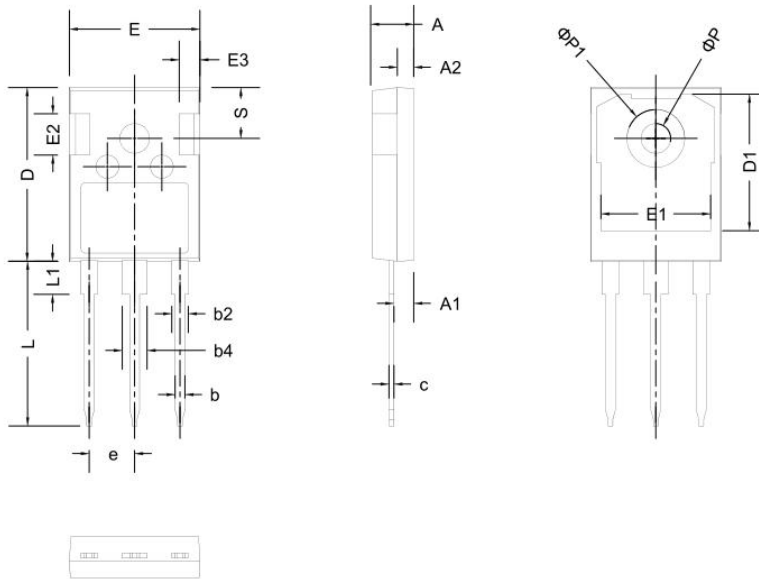
Fig.12 Safe Operating Area



**Ordering Information**

Part	Package	Marking	Packing method
CTCM035J65T2C	TO-247	35J65T2C	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		