

Descriptions

This is N-Ch SiC Power MOSFET in a TO-263-7L Plastic Package.

Features

- $V_{DS}=1200V$
- $I_D=60A$ ($T_c=25^{\circ}C$)
- $R_{DS}=32m\Omega$ ($V_{GS}=18V, T_J=25^{\circ}C$)
- Low On-Resistance with High Blocking Voltage
- High Speed Switching with Low Capacitance
- Avalanche Ruggedness
- Halogen Free, Rohs Compliant

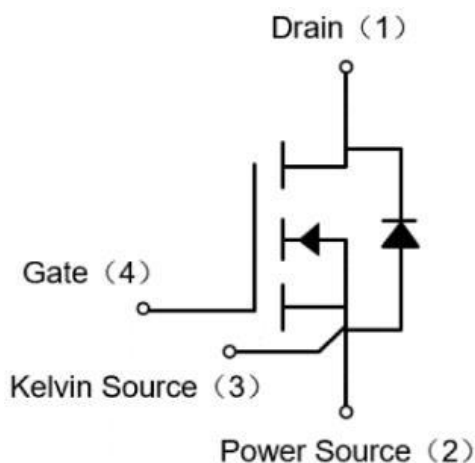
Applications

- 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}		1200	V
Recommend Gate-Source Voltage	V_{GSop}		-5/18	V
Gate-Source Voltage	V_{GSmax}		-8/20	V
Continuous drain current	I_D	$T_c=100^{\circ}\text{C}$, $V_{GS}=20\text{V}$	32	A
		$T_c=25^{\circ}\text{C}$, $V_{GS}=20\text{V}$	60	
Pulsed drain current	I_{DM}	t_{Pulse} limited by T_{Jmax}	100	A
Maximum power dissipation	P_{tot}	$T_c=25^{\circ}\text{C}$, $T_J=175^{\circ}\text{C}$	187	W
Operating Junction Temperature	T_J		-55~175	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-55~175	$^{\circ}\text{C}$

Thermal Characteristic

Thermal resistance, junction-to-case	$R_{\theta JC}$		0.8	$^{\circ}\text{C/W}$
Thermal resistance, junction-to-ambient	$R_{\theta JA}$		50	$^{\circ}\text{C/W}$

Electrical Characteristics of MOSFET

Drain-Source breakdown voltage	V(BR)DSS	ID=100uA, VGS=0V	TJ=25°C	1200	-	-	V
Gate threshold voltage	VGS(th)	ID=10mA, VDS=VGS	TJ=25°C	2.0	3.2	4.0	V
Zero gate voltage drain current	IDSS	VDS=1200V, VGS=0V	TJ=25°C	-	1	100	uA
Gate-Source leakage current	IGSS	VDS=0V, VGS=20V	TJ=25°C	-	-	200	nA
Drain-Source On-State resistance	RDS(ON)	VGS=18V, ID=33A	TJ=25°C	-	32	50	mΩ
			TJ=150°C	-	47	-	mΩ
Transconductance	gfs	VDS=20V, ID=33A	TJ=25°C	-	20	-	S
Internal gate resistor	RGint	f=1MHz, VAC=30mV	TJ=25°C	-	1.9	-	Ω
Input capacitance	Ciss	f=1MHz, VDS=1000V, VAC=30mV, VGS=0V	TJ=25°C	-	3400	-	pF
Output capacitance	Coss			-	133	-	pF
Reverse transfer capacitance	Crss			-	18.0	-	pF
Gate to source charge	QGS	VDS=800V	TJ=25°C	-	40	-	nC
Gate to drain charge	QGD	IDS=33A		-	37	-	nC
Total gate charge	QG	VGS= -5V/18V		-	128	-	nC
Turn-on delay time	td on	VDS=800V, IDS=33A, RG-ext=5Ω, VGS=-5V/18V,	TJ=25°C	-	60	-	ns
Rise time	tr		TJ=25°C	-	140	-	ns
Turn-off delay time	td off		TJ=25°C	-	50	-	ns
Fall time	tf		TJ=25°C	-	42	-	ns
Turn-on energy loss per pulse	Eon		TJ=150°C	-	1100	-	uJ
Turn-off energy loss per pulse	Eoff		TJ=150°C	-	410	-	uJ

Characteristics of Body Diode

Forward voltage	VSD	ISD=20A, 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=800V,	TJ=150°C	-	15	-	A
Reverse recovery time	trr	ISD=33A, VGS=-5V	TJ=150°C	-	35	-	ns
Recovery charge	Qrr	-di/dt=1200A/us	TJ=150°C	-	165	-	nC

Typical Characteristics

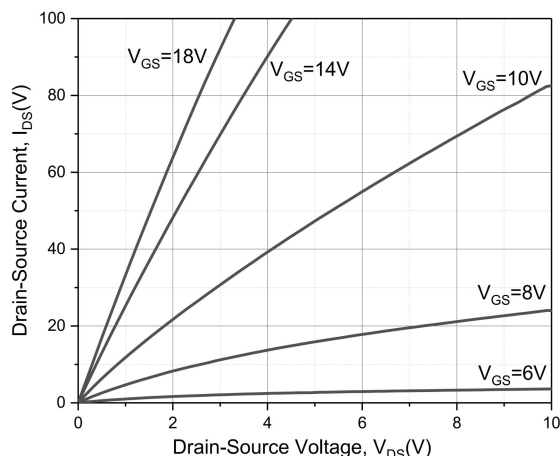
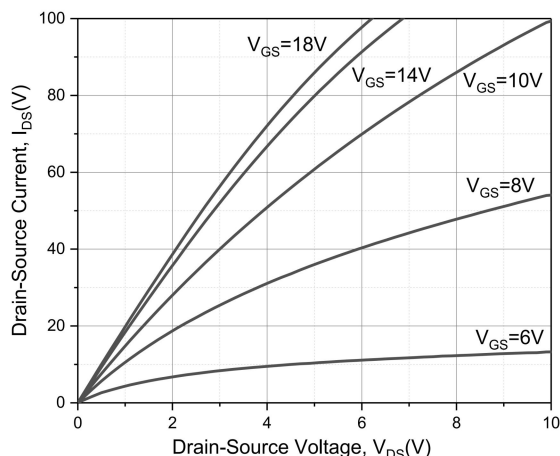
Fig.1 Typical Forward Output Characteristics
at $T_J=25^\circ\text{C}$ Fig.2 Typical Forward Output Characteristics
at $T_J=150^\circ\text{C}$ 

Fig.3 On-Resistance For Various Gate Voltage

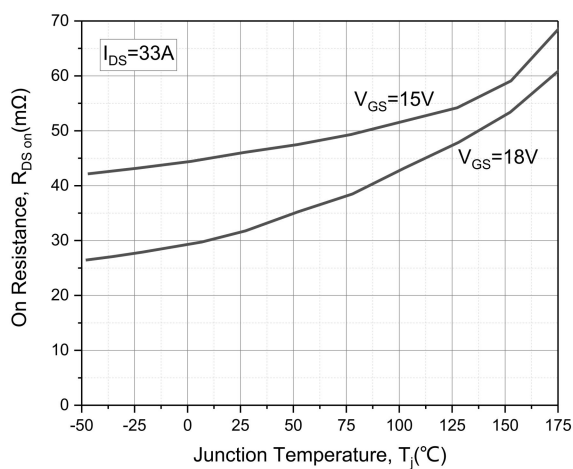
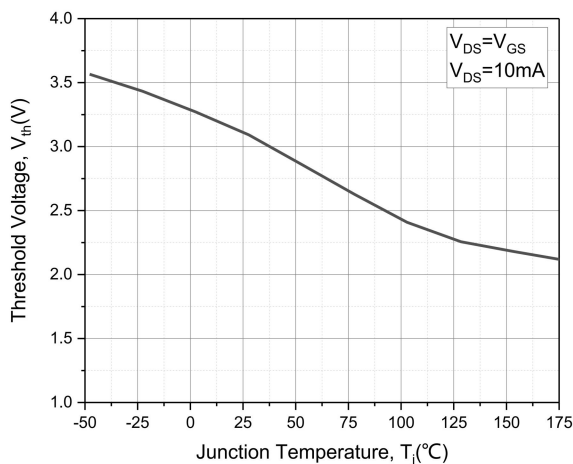
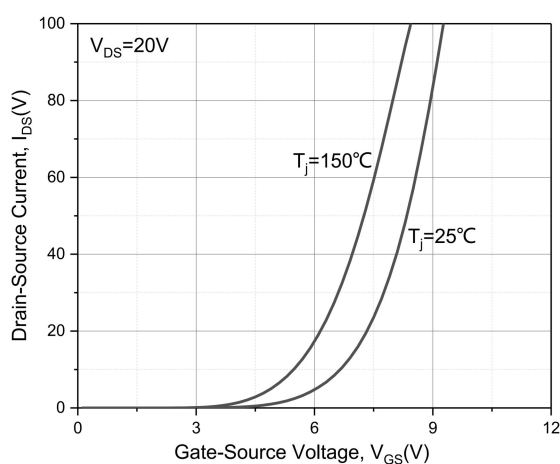
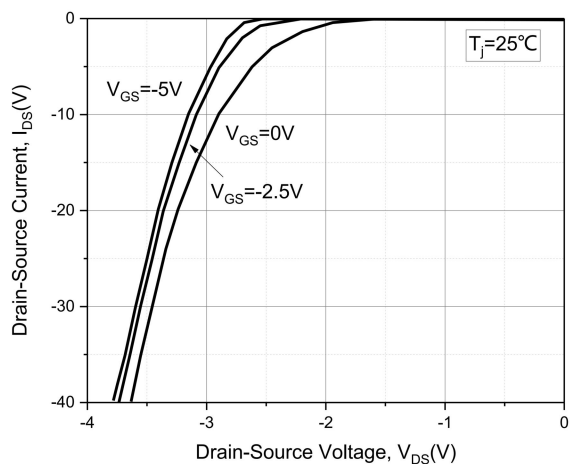


Fig.5 Threshold Voltage vs. Temperature

Fig.4 Transfer Characteristic for Various Junction
TemperaturesFig.6 Body Diode Characteristics at $T_J=25^\circ\text{C}$ 

Typical Characteristics

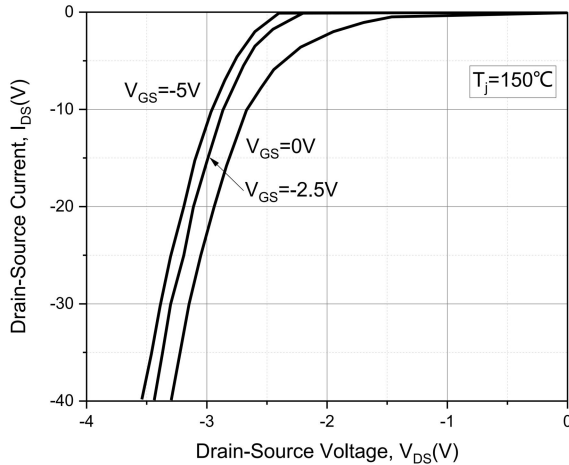
Fig.7 Body Diode Characteristics at $T_J = 150^\circ\text{C}$ 

Fig.8 Capacitance vs. Drain-Source Voltage (0 - 1200V)

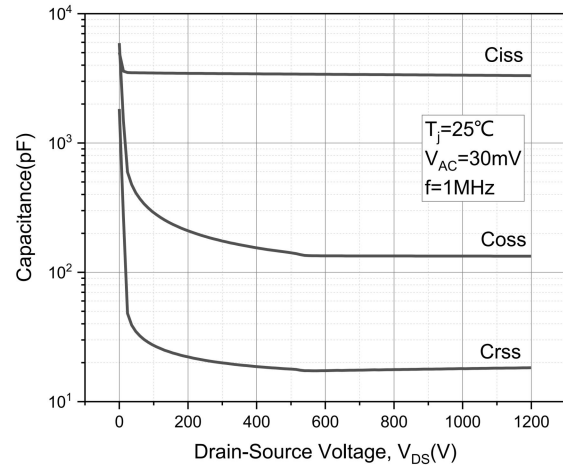


Fig.9 Gate Charge Characteristics

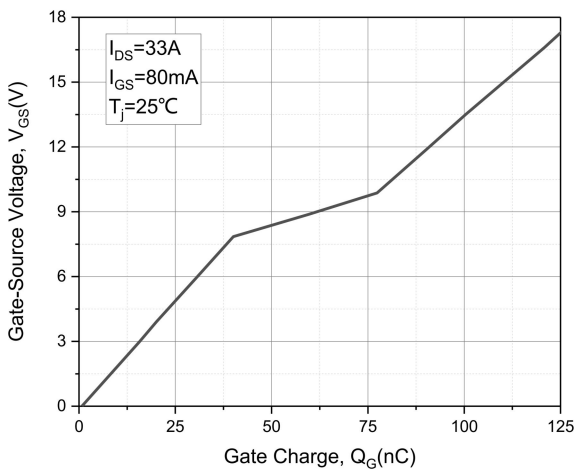


Fig.10 Maximum Power Dissipation Derating vs. Case Temperature

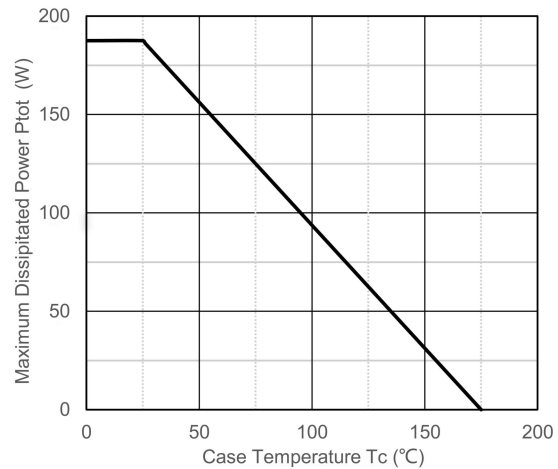


Fig.11 Transient Thermal Impedance (Junction – Case)

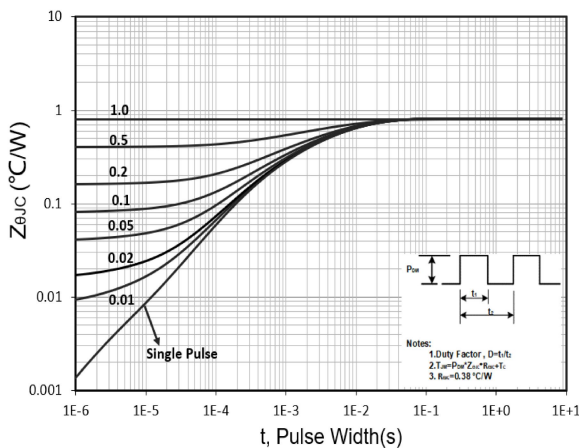
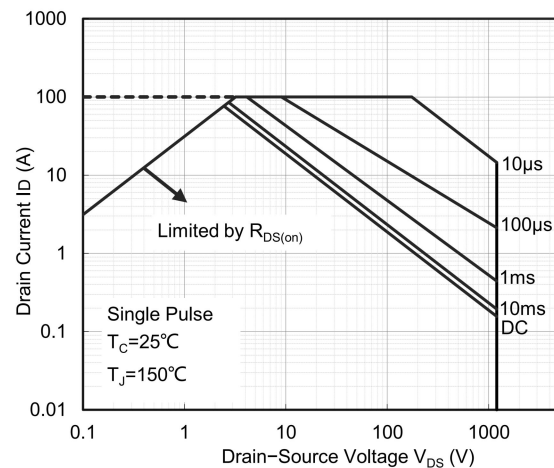


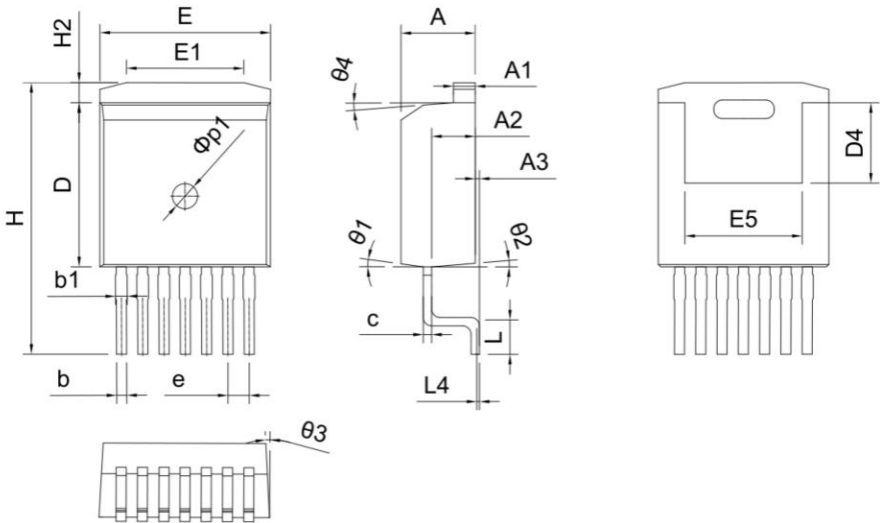
Fig.12 Maximum Safe Operating Area



Ordering Information

Part	Package	Marking	Packing method
CTCM032MA120T2C	TO-263-7L	32MA120T2C	Tape and reel

Package Information



SYMBOL	mm		
	MIN	NOM	MAX
A	4.30	4.43	4.56
A1	1.20	1.30	1.40
A2	2.45	2.60	2.75
A3	0.00	0.13	0.25
b	0.50	0.60	0.70
b1	0.60	0.70	0.90
c	0.45	0.50	0.60
D	8.93	9.08	9.23
D4	4.65	4.80	4.95
E	10.08	10.18	10.28
E1	6.50	7.00	7.50
E5	6.82	7.22	7.62
e	1.27 BSC		
H	15.00	15.50	16.00
H2	0.98	1.20	1.42
L	1.90	2.20	2.50
L4	0.25 BSC		
$\phi p1$	1.40	1.50	1.60
$\theta 1$	3°	5°	7°
$\theta 2$	3°	5°	7°
$\theta 3$	3°	5°	7°
$\theta 4$	3°	5°	7°