

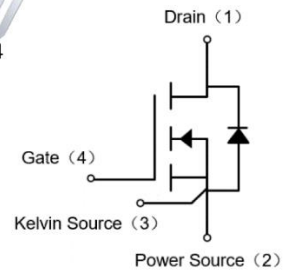
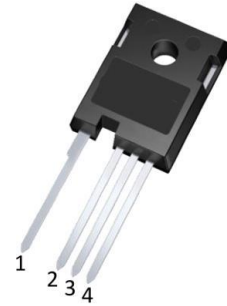
N-Ch SiC Power MOSFET

$$V_{DS}=1200V$$

$$I_D=60A \quad (T_J=25^\circ C)$$

$$R_{DS}=32m\Omega \quad (V_{GS}=18V, T_J=25^\circ C)$$

TO-247-4



Features:

- Low On-Resistance with High Blocking Voltage
- High Speed Switching with Low Capacitance
- Avalanche Ruggedness
- Halogen Free, Rohs Compliant

Benefits:

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

Applications:

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

Maximum Rated Value 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	$T_C=100^\circ C, V_{GS}=20V$	40	A
		$T_C=25^\circ C, V_{GS}=20V$	60	
Pulsed drain current	I_{DM}	t_{Pulse} limited by T_{jmax}	100	A
Maximum power dissipation	P_{tot}	$T_C=25^\circ C, T_J=175^\circ C$	312	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	$R_{\theta JC}$		0.48	$^\circ C/W$
Thermal resistance, junction-to-ambient	$R_{\theta JA}$		42	$^\circ C/W$

Electrical Characteristics of MOSFET

				Min.	Typ.	Max.	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	$I_D=100\mu A, V_{GS}=0V$	$T_J=25^\circ C$	1200	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=10mA, V_{DS}=V_{GS}$	$T_J=25^\circ C$	2.0	3.2	4.0	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=1200V, V_{GS}=0V$	$T_J=25^\circ C$	-	1	100	μA
Gate-Source leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=20V$	$T_J=25^\circ C$	-	-	200	nA
Drain-Source On-State resistance	$R_{DS(ON)}$	$V_{GS}=18V, I_D=33A$	$T_J=25^\circ C$	-	32	50	m Ω
			$T_J=150^\circ C$	-	47	-	m Ω
Transconductance	g_{fs}	$V_{DS}=20V, I_D=33A$	$T_J=25^\circ C$	-	20	-	S
Internal gate resistor	R_{Gint}	$f=1MHz, V_{AC}=30mV$	$T_J=25^\circ C$	-	1.9	-	Ω
Input capacitance	C_{iss}	$f=1MHz, V_{DS}=1000V, V_{AC}=30mV, V_{GS}=0V$	$T_J=25^\circ C$	-	3400	-	pF
Output capacitance	C_{oss}			-	133	-	pF
Reverse transfer capacitance	C_{rss}			-	18.0	-	pF
Gate to source charge	Q_{GS}	$V_{DS}=800V, I_{DS}=33A, V_{GS}=-5V/18V$	$T_J=25^\circ C$	-	40	-	nC
Gate to drain charge	Q_{GD}			-	37	-	nC
Total gate charge	Q_G			-	128	-	nC
Turn-on delay time	t_{don}	$V_{DS}=800V, I_{DS}=33A, R_{G-ext}=5\Omega, V_{GS}=-5V/18V,$	$T_J=25^\circ C$	-	60	-	ns
Rise time	t_r		$T_J=25^\circ C$	-	140	-	ns
Turn-off delay time	t_{doff}		$T_J=25^\circ C$	-	50	-	ns
Fall time	t_f		$T_J=25^\circ C$	-	42	-	ns
Turn-on energy loss per pulse	E_{on}		$T_J=150^\circ C$	-	1100	-	μJ
Turn-off energy loss per pulse	E_{off}		$T_J=150^\circ C$	-	410	-	μJ

Characteristics of Body Diode

				Min.	Typ.	Max.	
Forward voltage	V_{SD}	$I_{SD}=20A, V_{GS}=-5V$	$T_J=25^\circ C$	-	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}	$V_{DS}=800V, I_{SD}=33A, V_{GS}=-5V, -di/dt=1200A/\mu s$	$T_J=150^\circ C$	-	15	-	A
Reverse recovery time	t_{rr}		$T_J=150^\circ C$	-	35	-	ns
Recovery charge	Q_{rr}		$T_J=150^\circ C$	-	165	-	nC

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

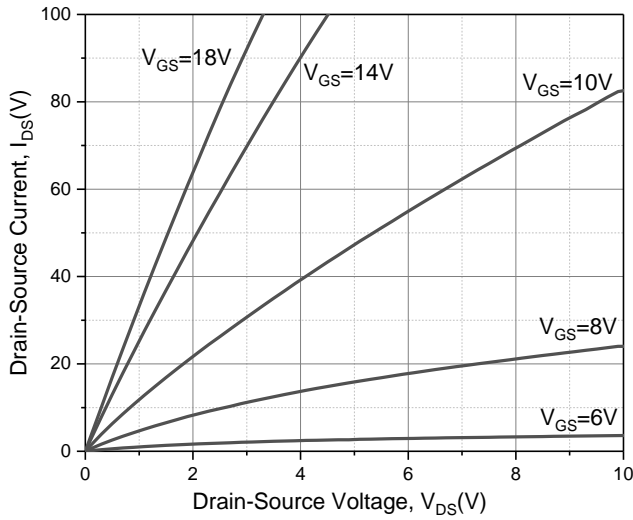


Fig.3 On-Resistance For Various Gate Voltage

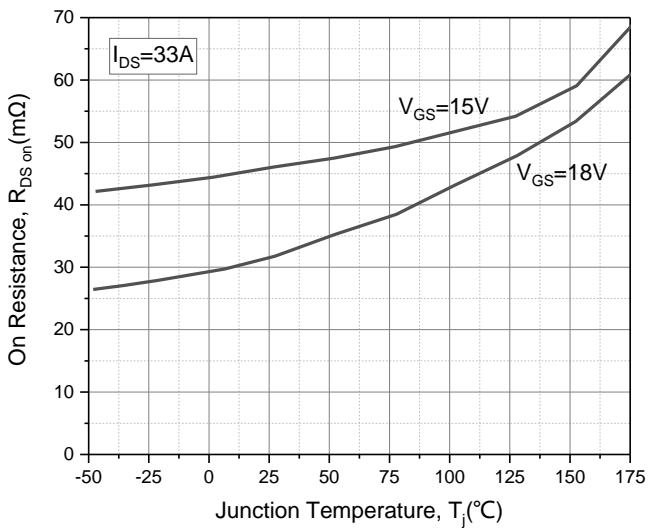


Fig.5 Threshold Voltage vs. Temperature

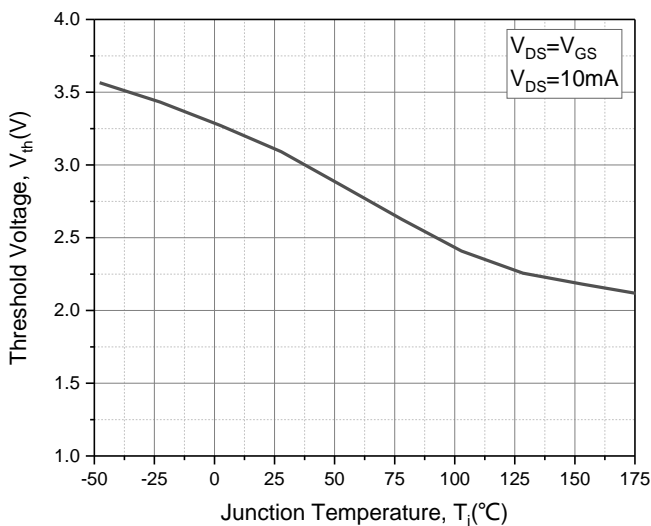


Fig.2 Typical Forward Output Characteristics at $T_J=150^\circ\text{C}$

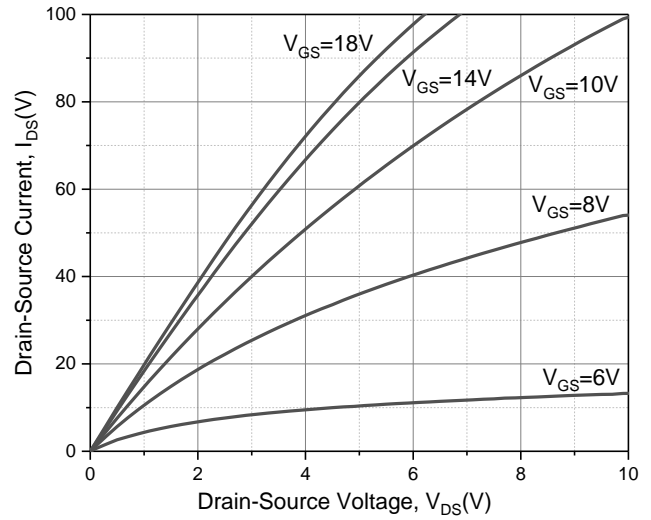


Fig.4 Transfer Characteristic for Various Junction Temperatures

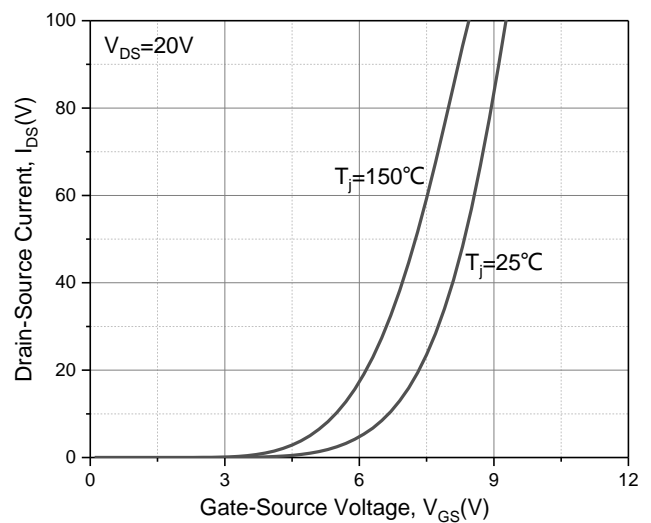


Fig.6 Body Diode Characteristics at $T_J=25^\circ\text{C}$

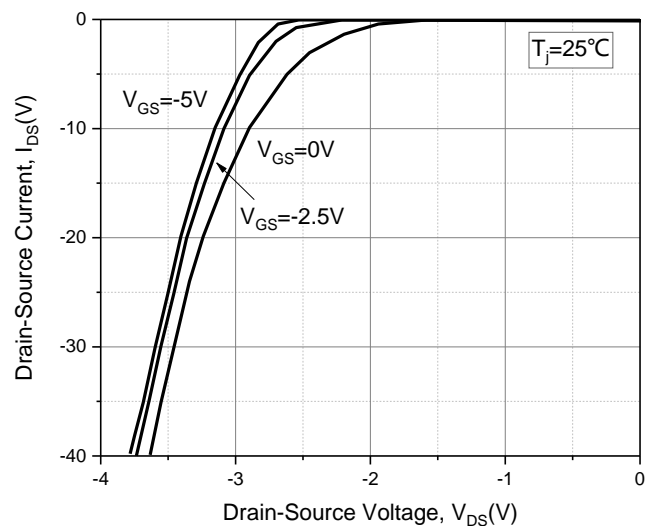


Fig.7 Body Diode Characteristics at $T_J = 150^\circ\text{C}$

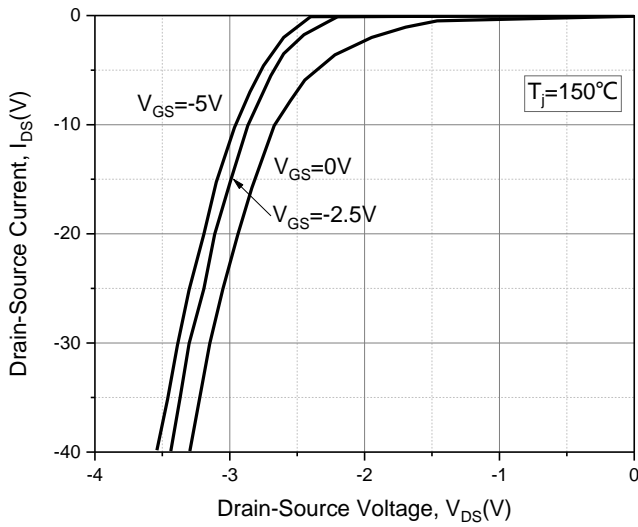


Fig.9 Gate Charge Characteristics

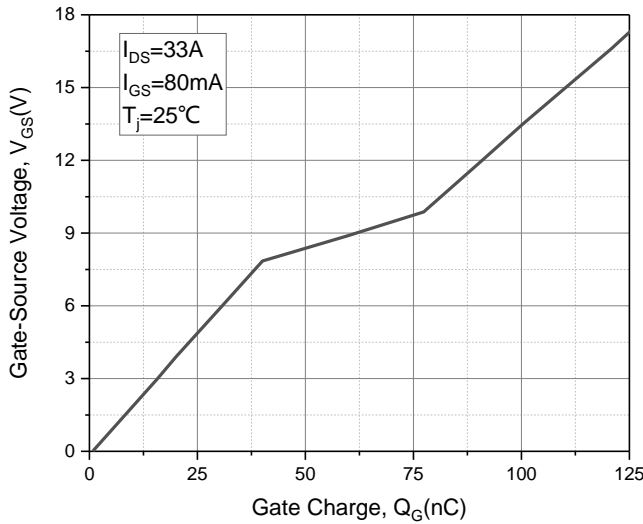


Fig.11 Transient Thermal Impedance (Junction – Case)

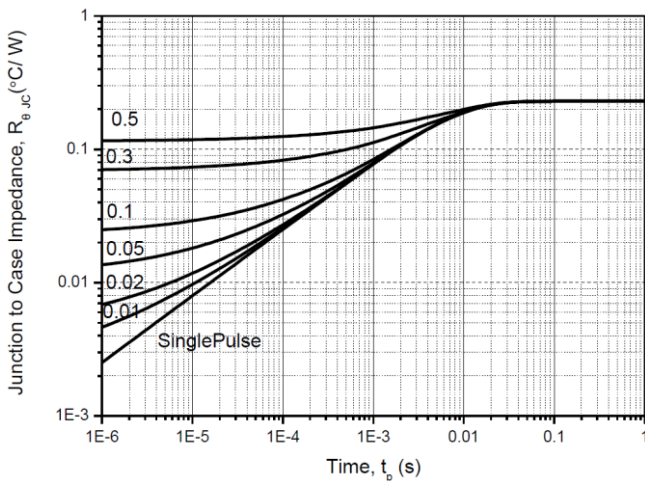


Fig.8 Capacitance vs. Drain-Source Voltage (0 - 1200V)

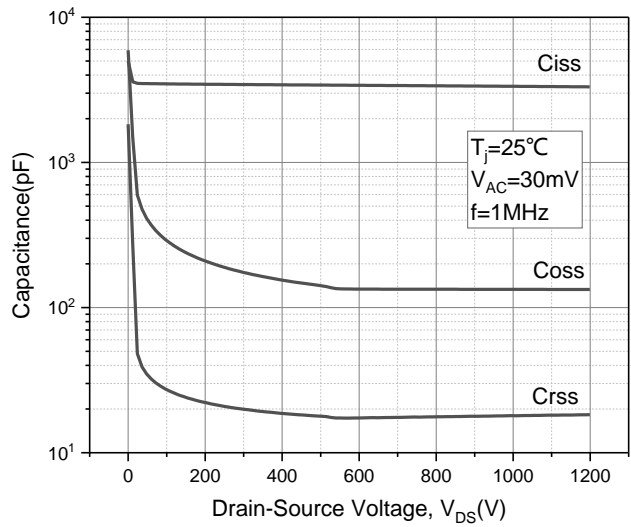
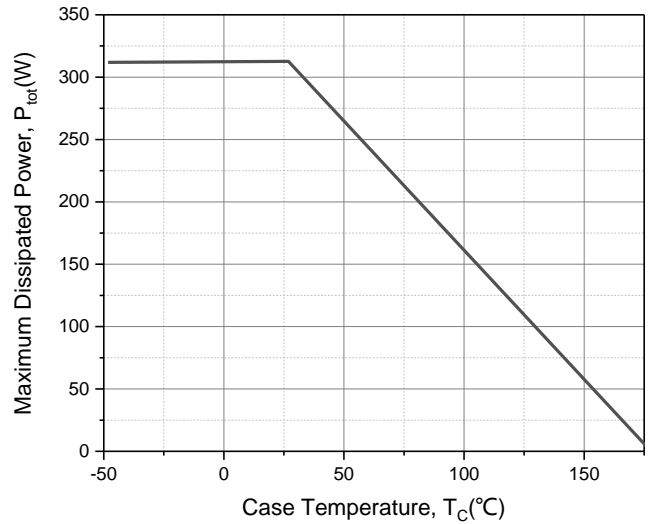
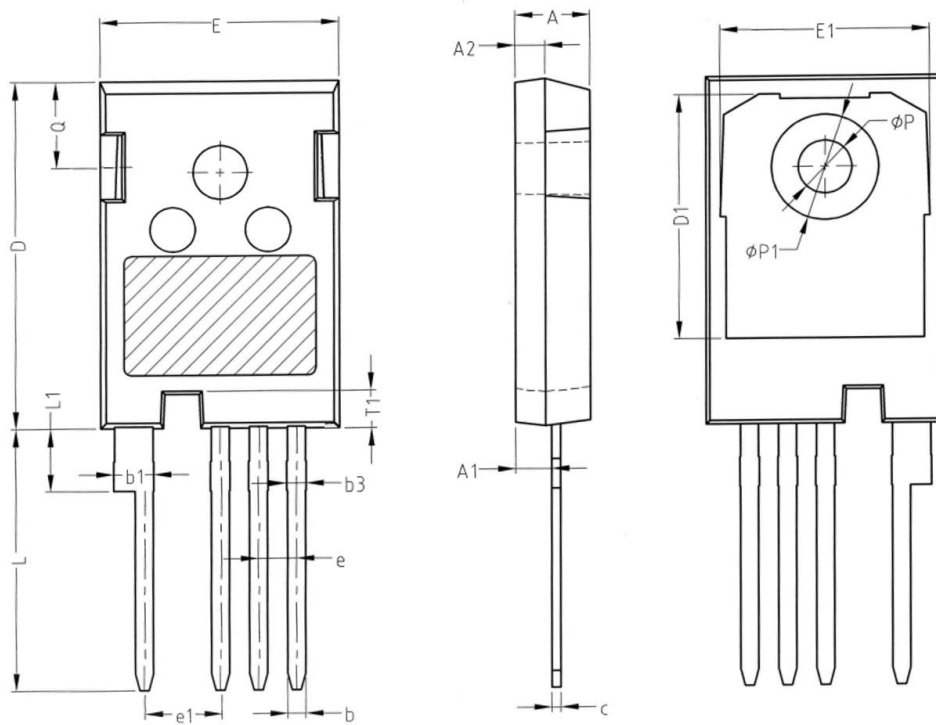


Fig.10 Maximum Power Dissipation Derating vs. Case Temperature



Package Dimensions



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
Φp	3.40	3.60	3.80
Φp1	7.19 REF		

Ordering Information

Part	Package	Marking	Packing method
WSCM032R120T2C	TO-247-4	32R120T2C	Tube


Contact Information

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Product Specification Statement

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2. The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.

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5. The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.

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