

N-Ch SiC Power MOSFET

$V_{DS}=1700V$

$I_D=5A$ ($T_c=25^\circ C$)

$R_{DS}=710m\Omega$ ($V_{GS}=15V, T_J=25^\circ C$)

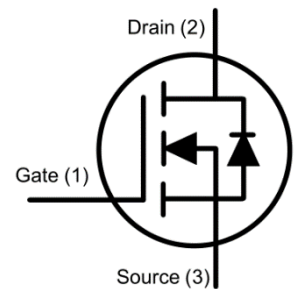
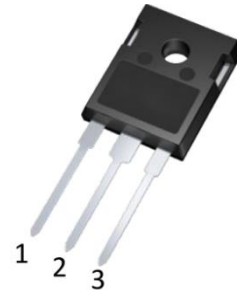
Features:

- Low On-Resistance with High Blocking Voltage
- Low Capacitance
- Halogen Free, Rohs Compliant

Benefits:

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

TO-247



Applications:

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

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	$V_{GS}=15V, T_c=100^\circ C$	3.5	A
		$V_{GS}=15V, T_c=25^\circ C$	5	A
Pulsed drain current	I_{DM}	t_{Pulse} limited by T_{jmax}	12	A
Maximum power dissipation	P_{tot}	$T_c=25^\circ C, T_J=150^\circ C$	70	W
Operating Junction Temperature	T_J		-55~150	$^\circ C$
Storage Temperature	T_{stg}		-55~150	$^\circ C$

Thermal Characteristic

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

Electrical Characteristics of MOSFET

				Min.	Typ.	Max.	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	$I_D=250\mu A, V_{GS}=0V$	$T_J=25^\circ C$	1700	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=5mA, V_{DS}=V_{GS}$	$T_J=25^\circ C$	2.0	2.9	4.0	V
			$T_J=150^\circ C$	-	2.0	-	
Zero gate voltage drain current	I_{DSS}	$V_{DS}=1700V, V_{GS}=0V$	$T_J=25^\circ C$	-	-	100	μA
Gate-Source leakage current	I_{GSSF}	$V_{DS}=0V, V_{GS}=20V$	$T_J=25^\circ C$	-	-	200	nA
	I_{GSSR}	$V_{DS}=0V, V_{GS}=-4V$	$T_J=25^\circ C$	-	-	-200	nA
Drain-Source On-State resistance	$R_{DS(ON)}$	$V_{GS}=15V, I_D=2A$	$T_J=25^\circ C$	-	710	850	m Ω
			$T_J=150^\circ C$	-	1010	-	m Ω
		$V_{GS}=12V, I_D=2A$	$T_J=25^\circ C$	-	1040	1200	m Ω
			$T_J=150^\circ C$	-	1230	-	m Ω
Transconductance	g_{fs}	$V_{DS}=20V, I_D=2A$	$T_J=25^\circ C$	-	7.3	-	S
Internal gate resistance	R_{Gint}	$f=1MHz, V_{AC}=25mV$	$T_J=25^\circ C$	-	20	-	Ω
Input capacitance	C_{iss}	$f=1MHz, V_{DS}=1000V, V_{GS}=0V, V_{AC}=25mV$	$T_J=25^\circ C$	-	380	-	pF
Output capacitance	C_{oss}		$T_J=25^\circ C$	-	14	-	pF
Reverse transfer capacitance	C_{rss}		$T_J=25^\circ C$	-	3.2	-	pF
Gate to source charge	Q_{GS}	$V_{DS}=800V$	$T_J=25^\circ C$	-	4.8	-	nC
Gate to drain charge	Q_{GD}	$I_D=2A$	$T_J=25^\circ C$	-	5.6	-	nC
Total gate charge	Q_G	$V_{GS}=-5V/20V$	$T_J=25^\circ C$	-	13	-	nC
Turn-on delay time	t_{don}	$V_{DS}=1200V, I_{DS}=2A, R_{G-ext}=2.5\Omega, V_{GS}=-5V/20V,$	$T_J=25^\circ C$	-	6	-	ns
Rise time	t_r		$T_J=25^\circ C$	-	9.5	-	ns
Turn-off delay time	t_{doff}		$T_J=25^\circ C$	-	14	-	ns
Fall time	t_f		$T_J=25^\circ C$	-	23	-	ns
Turn-on energy loss per pulse	E_{on}		$T_J=25^\circ C$	-	37	-	μJ
Turn-off energy loss per pulse	E_{off}		$T_J=25^\circ C$	-	15	-	μJ

Characteristics of Body Diode

				Min.	Typ.	Max.	
Forward voltage	V_{SD}	$I_{SD}=1A, V_{GS}=-4V$	$T_J=25^\circ C$	-	3.5	-	V
Continuous diode forward current	I_S		$T_J=25^\circ C$	-	-	4	A
Peak reverse recovery current	I_{RM}	$V_R=1200V, I_{SD}=2A,$	$T_J=150^\circ C$	-	3.5	-	A
Reverse recovery time	t_{rr}	$V_{GS}=-5V$	$T_J=150^\circ C$	-	22	-	ns
Recovery charge	Q_{rr}	$-di/dt=1200A/\mu s$	$T_J=150^\circ C$	-	31	-	nC

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

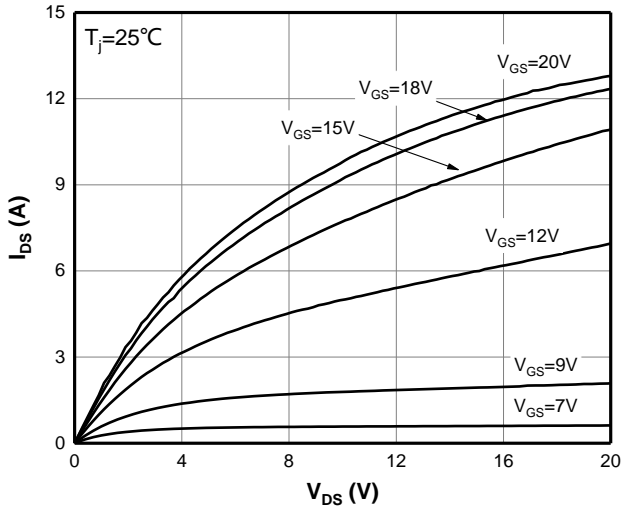


Fig.3 Transfer Characteristics for Various Temperature

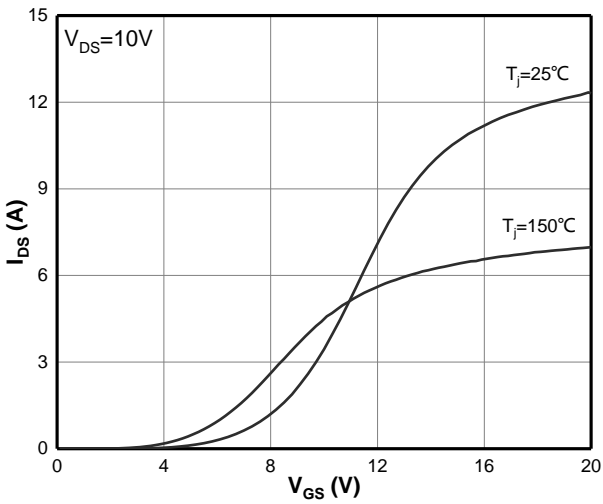


Fig.5 Normalized On-Resistance vs. Temperature for Various Gate Voltage

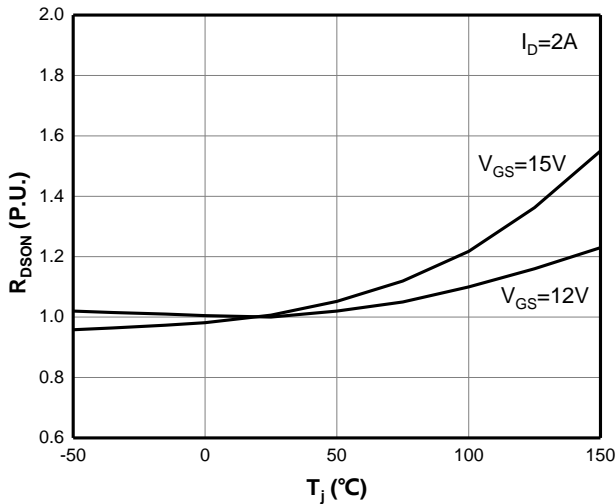


Fig.2 Typical Forward Output Characteristics at $T_J=150^\circ\text{C}$

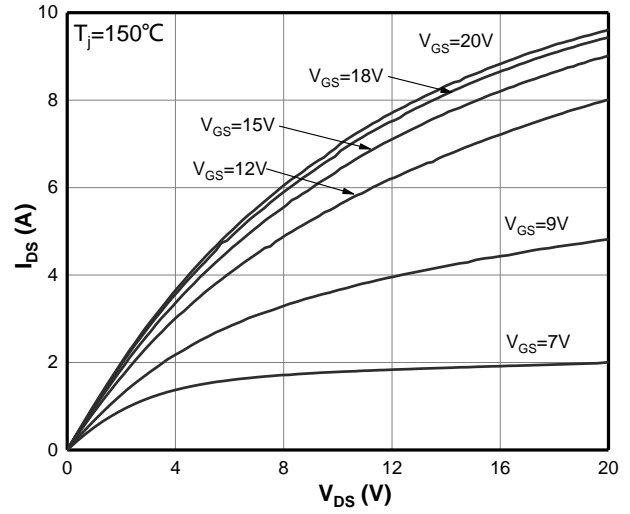


Fig.4 Threshold Voltage for Various Temperature

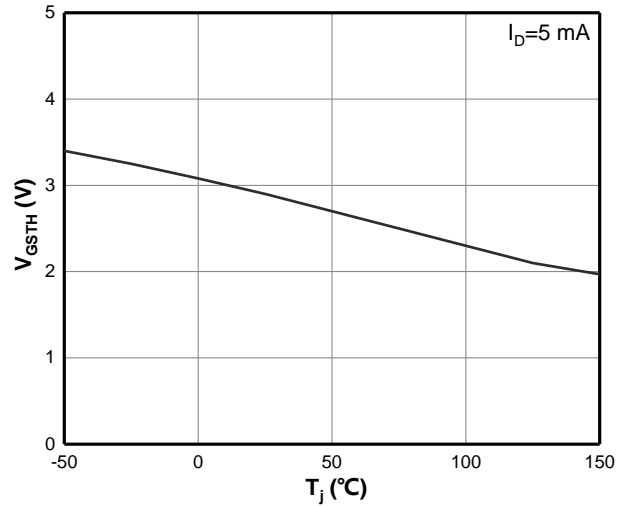


Fig.6 On-Resistance vs. Temperature for Various Gate Voltage

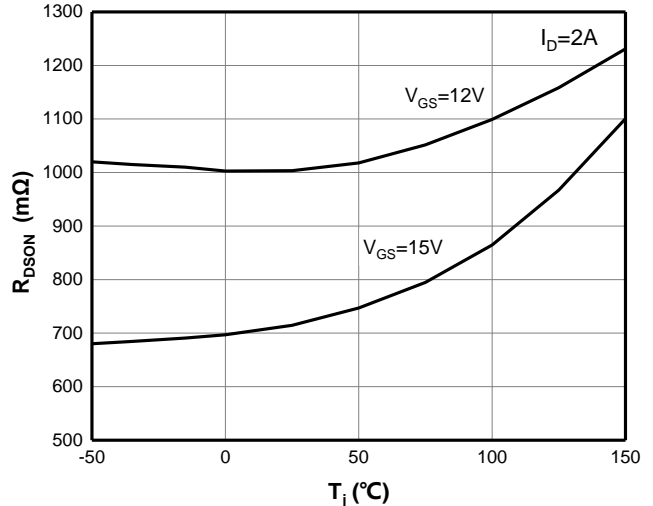


Fig.7 Breakdown Voltage vs. Temperature

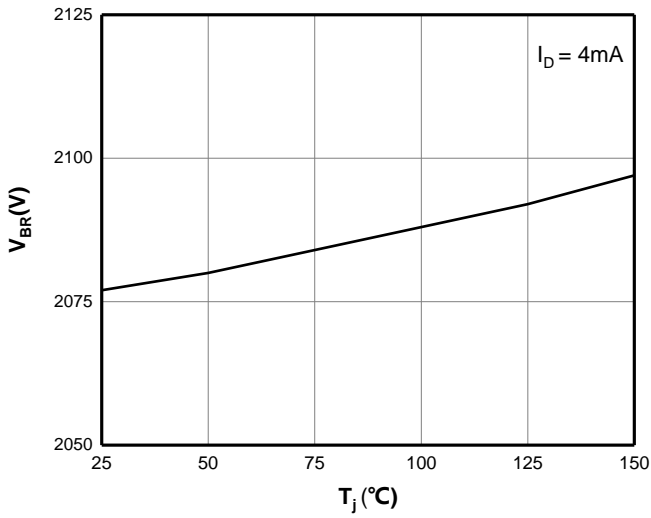


Fig.9 Capacitance vs. Drain-Source Voltage

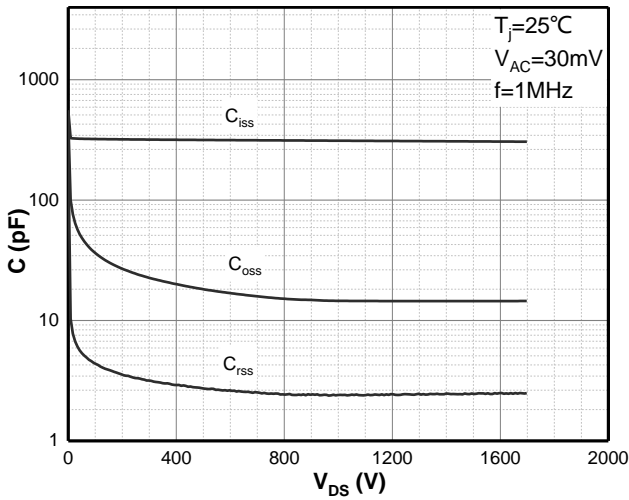


Fig.11 Continuous Drain Current Derating vs. Case Temperature

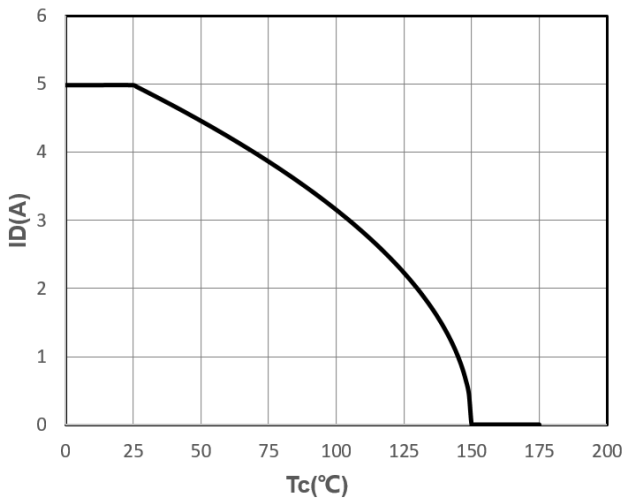


Fig.8 Body Diode Characteristics

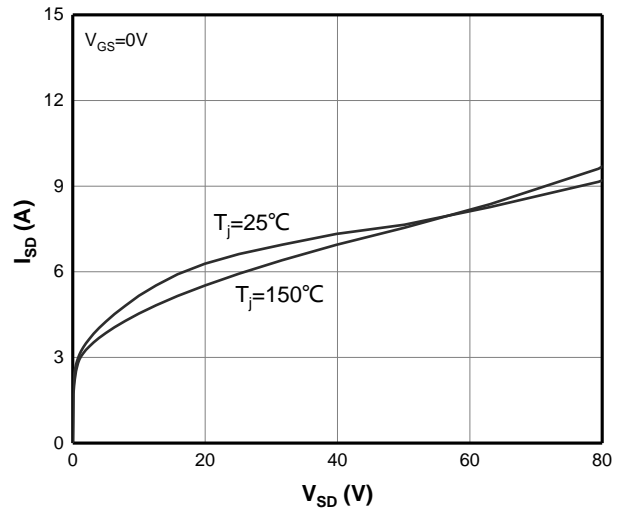


Fig.10 Gate Charge Characteristics

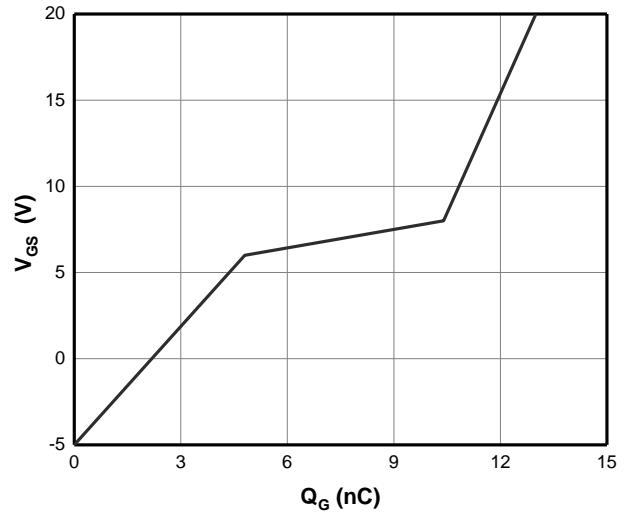


Fig.12 Clamped inductive switching energy vs. temperature

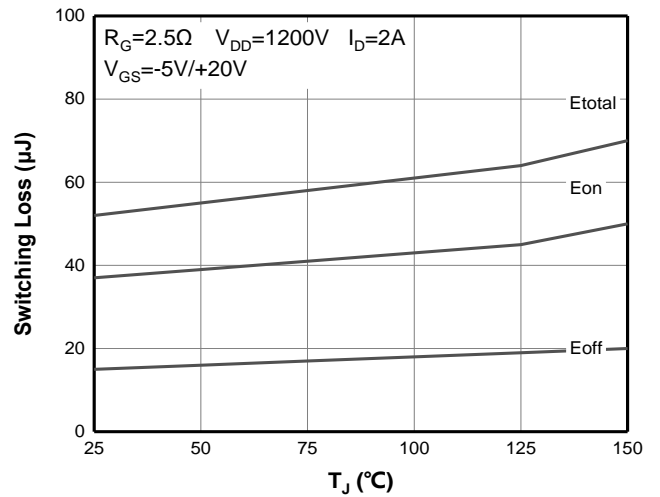


Fig.13 Clamped Inductive Switching Energy vs. External Gate Resistance

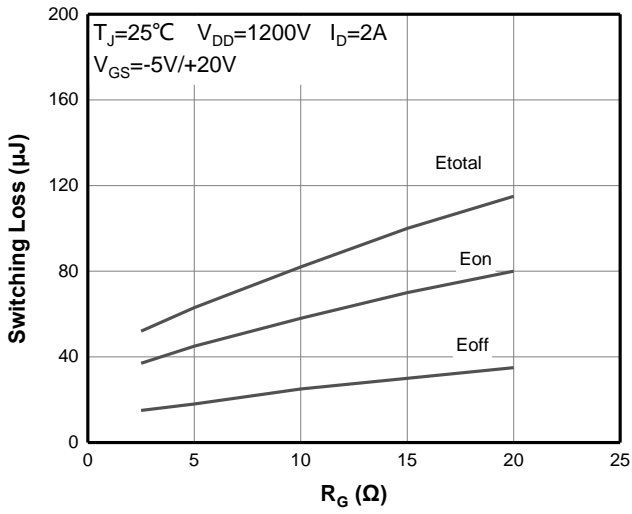


Fig.14 Safe Operating Area

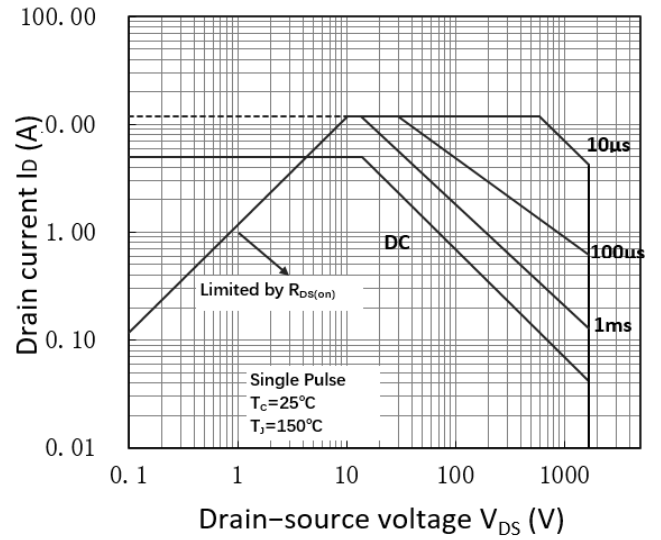
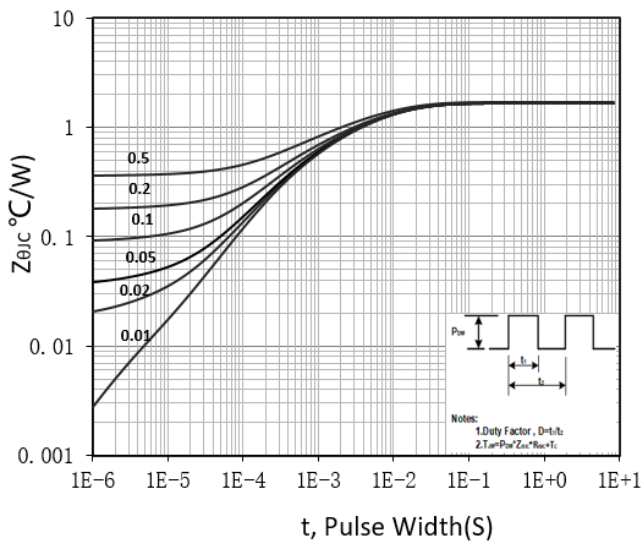
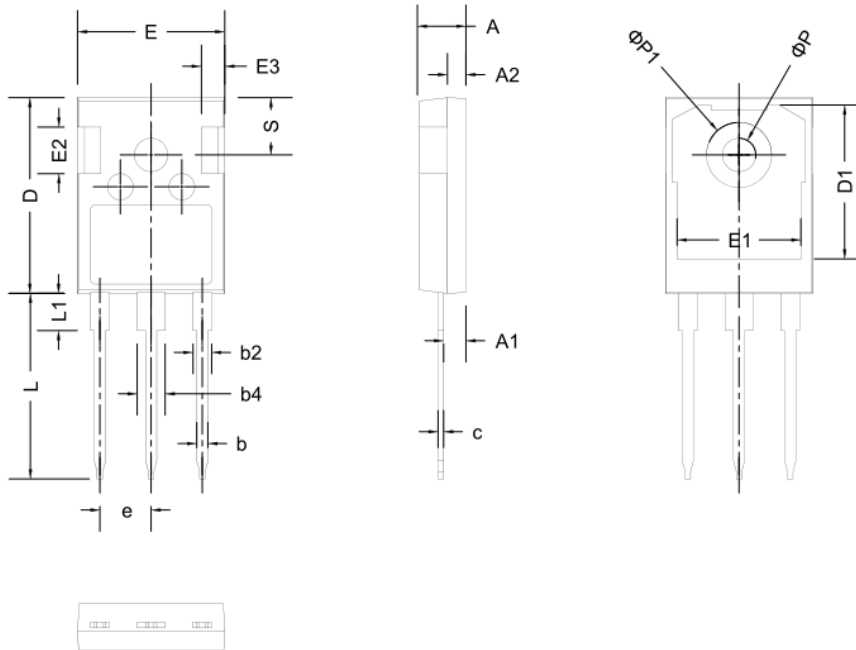


Fig.15 Transient Thermal Impedance (Junction – Case)



Package Dimensions



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		

Ordering Information

Part	Package	Marking	Packing method
WSCM01KJ170T2C	TO-247	1KJ170T2C	Tube


Contact Information

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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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