

General Description

The series of devices use advanced super junction technology and design to provide excellent RDS(ON) with low gate charge. This super junction MOSFET fits the industry's AC-DC SMPS requirements for PFC, AC/DC power conversion, and industrial power applications

Features

- Low on-resistance and low conduction losses
- 100% Avalanche Tested
- RoHS Compliant

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	20	A
$I_D@T_C=100^\circ C$	Continuous Drain Current	14	A
I_{DM}	Pulsed Drain Current <small>(Note 1)</small>	80	A
EAS	Single Pulse Avalanche Energy <small>(Note 2)</small>	80	mJ
dv/dt	Peak Diode Recovery dv/dt <small>(Note 3)</small>	15	V/ns
$P_D@T_C=25^\circ C$	Total Power Dissipation	250	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	65	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.47	$^\circ C/W$

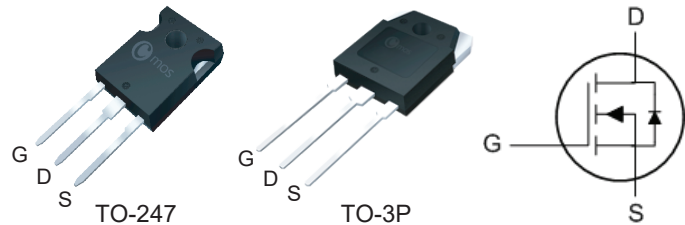
Product Summary

BVDSS	RDSON	ID
650V	0.19 Ω	20A

Applications

- Power factor correction (PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply (UPS)

TO-247/3P Pin Configuration



Type	Package	Marking
CMH65R190Q	TO-247	CMH65R190Q
CMA65R190Q	TO-3P	CMA65R190Q

Electrical Characteristics (T_J=25°C , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	650	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =10A	---	---	0.19	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2	---	4	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =650V , V _{GS} =0V	---	---	1	uA
		V _{DS} =650V , V _{GS} =0V , T _C =125°C	---	---	100	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±30V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance ³	V _{DS} =15V , I _D =9A	---	14	---	S
Q _g	Total Gate Charge	I _D =10A V _{DS} =480V V _{GS} =10V (Note 4)	---	37	---	nC
Q _{gs}	Gate-Source Charge		---	8.7	---	
Q _{gd}	Gate-Drain Charge		---	13	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =400V I _D =10A R _G =3.3Ω V _{GS} =10V (Note 4)	---	38	---	ns
T _r	Rise Time		---	40	---	
T _{d(off)}	Turn-Off Delay Time		---	170	---	
T _f	Fall Time		---	45	---	
C _{iss}	Input Capacitance	V _{DS} =100V , V _{GS} =0V , f=1MHz	---	2400	---	pF
C _{oss}	Output Capacitance		---	1500	---	
C _{rss}	Reverse Transfer Capacitance		---	1450	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _{GS} =V _{DS} =0V , Force Current	---	---	20	A
I _{SM}	Pulsed Source Current		---	---	80	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _F =20A , T _J =25°C	---	---	1.4	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0V , V _{DS} = 400V, I _S =10A , di/dt=100A/μs	---	318	---	ns
Q _{rr}	Reverse Recovery Charge		---	5.5	---	uC

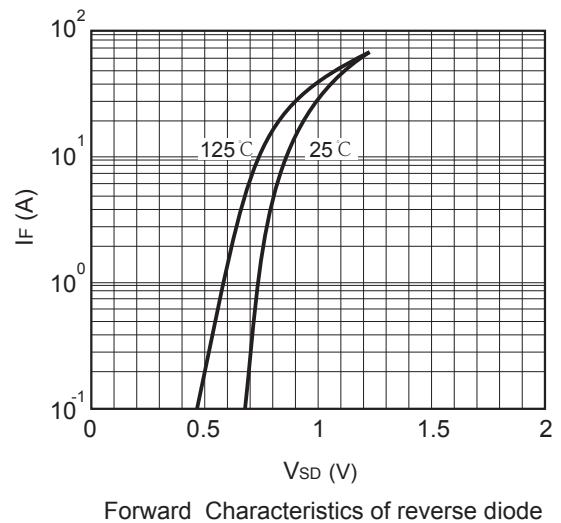
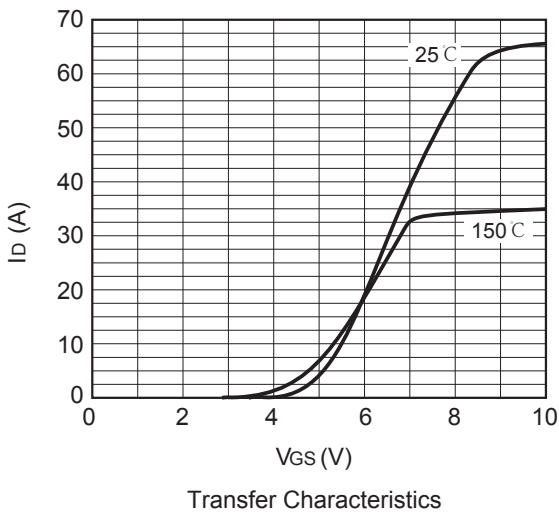
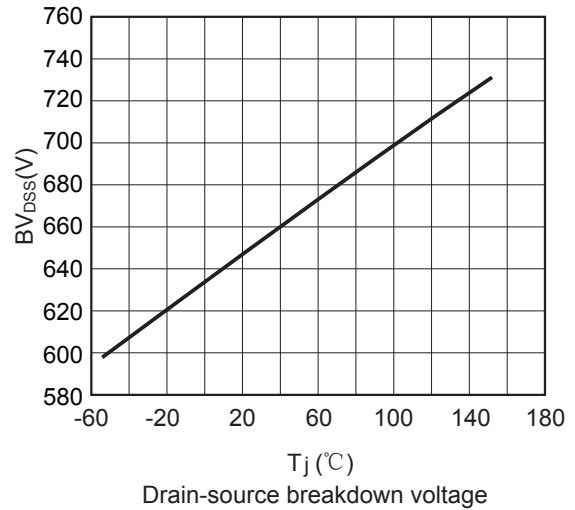
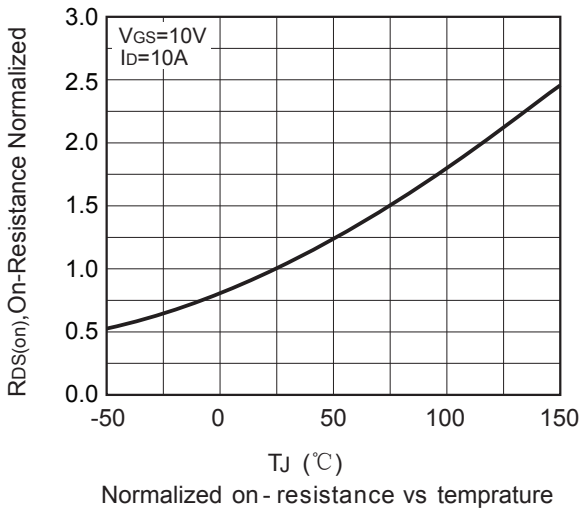
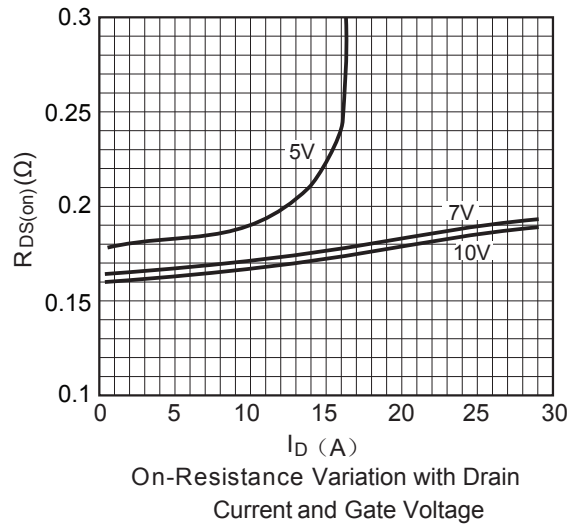
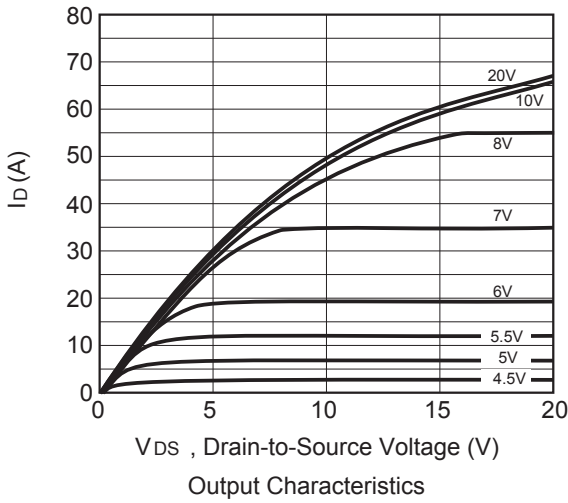
Note :

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_D=18A, L=0.5mH, V_{DD}=50V, Starting T_J=25°C
3. I_{SD}≤I_D, di/dt≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C
4. Essentially Independent of Operating Temperature Typical Characteristics

This product has been designed and qualified for the consumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserves the right to improve product design, functions and reliability without notice.

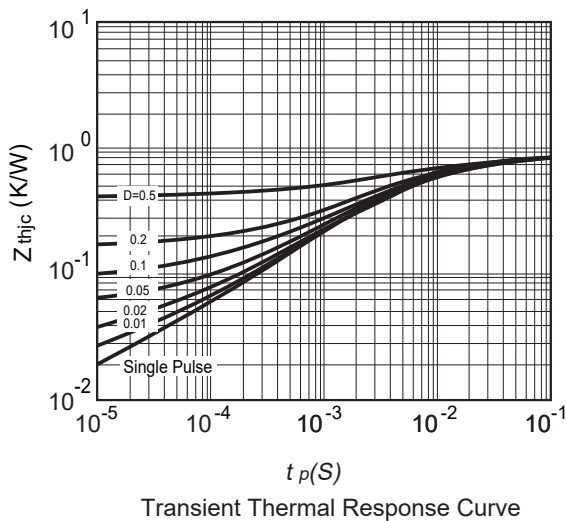
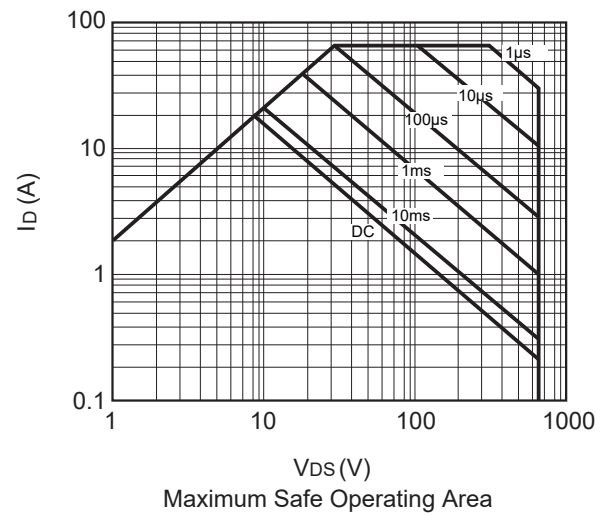
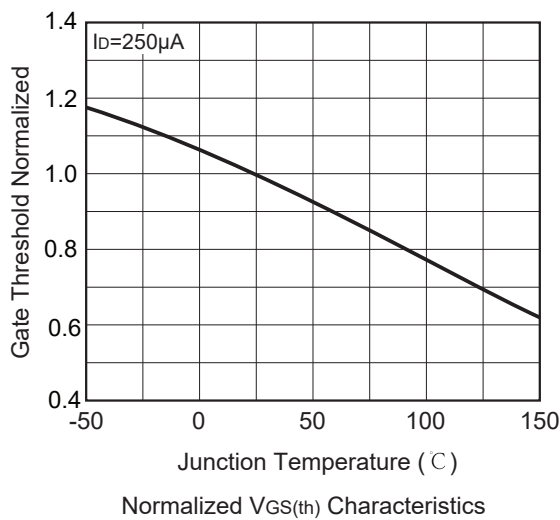
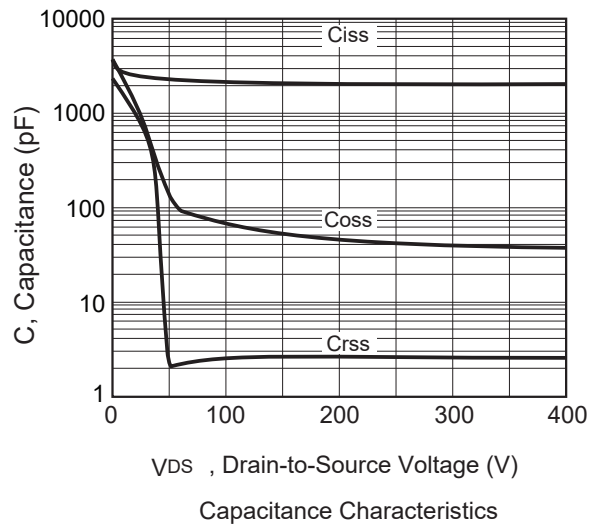
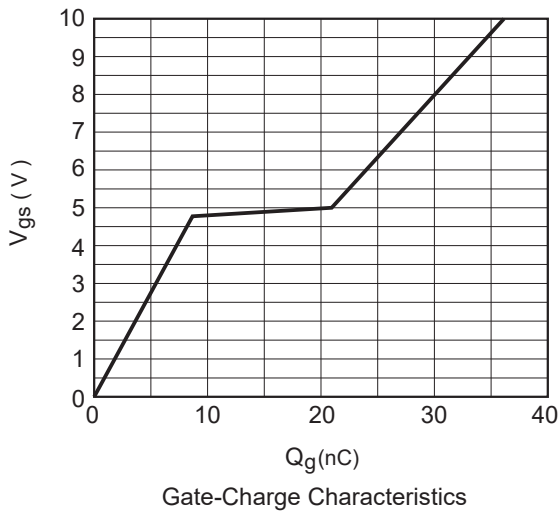
Typical Characteristics

N-Channel Super Junction Power MOSFET



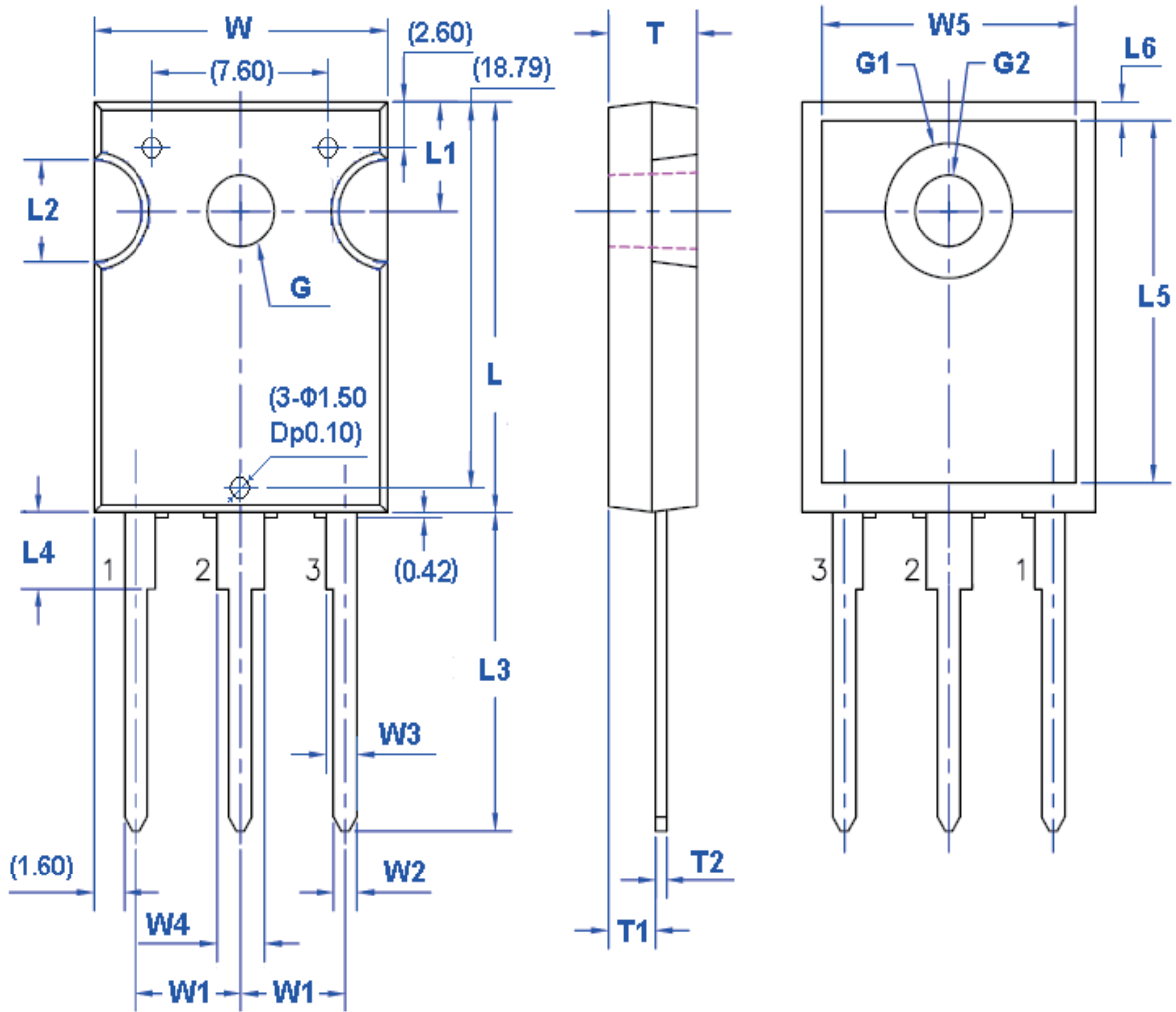
Typical Characteristics

N-Channel Super Junction Power MOSFET



Package Dimensions

TO-247 Package Outline Drawing



(Unit : mm)

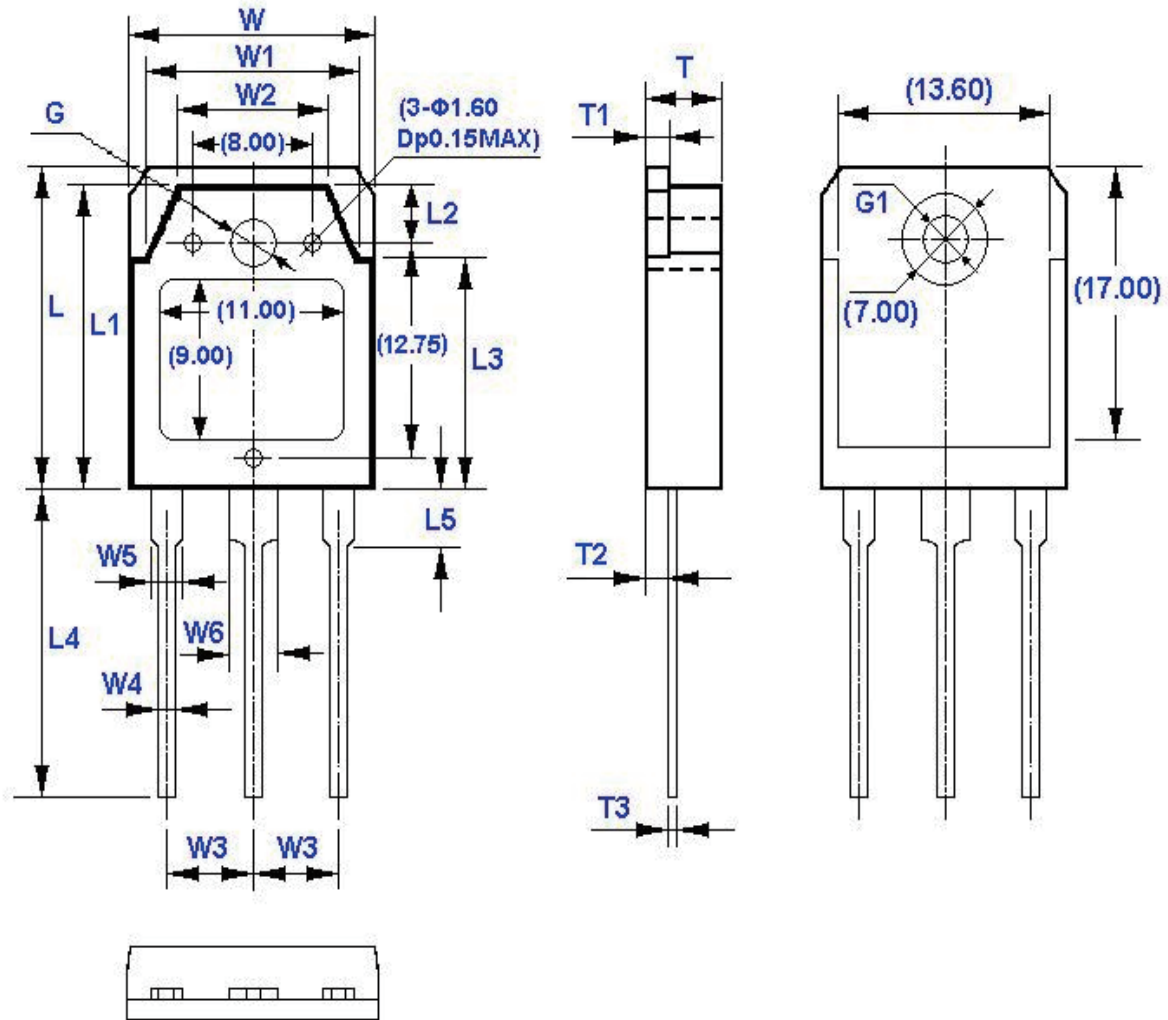
Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	15.37	15.87	W5	12.70	13.00	L4	3.69	3.93	T2	0.51	0.71
W1	5.56 (TYP)		L	20.32	20.82	L5	16.00	17.00	G(Φ)	3.51	3.65
W2	1.17	1.35	L1	5.34	5.58	L6	0.51	1.35	G1(Φ)	6.61	6.85
W3	1.53	1.77	L2	4.96	5.20	T	4.58	4.82	G2(Φ)	3.51	3.65
W4	2.42	2.66	L3	15.75	16.25	T1	2.29	2.66			

Note: The values in () are reference values. Size does not include burrs and mold flash

Package Dimensions

N-Channel Super Junction Power MOSFET

TO-3P Package Outline Drawing



(Unit : mm)

Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	15.40	15.80	W5	1.80	2.20	L3	13.70	14.10	T2	1.20	1.60
W1	13.40	13.80	W6	2.80	3.20	L4	19.70	20.30	T3	0.55	0.75
W2	9.40	9.80	L	19.70	20.10	L5	3.30	3.70	G (Φ) (front)	3.30	3.50
W3	5.45 (TYP)		L1	18.50	18.90	T	4.60	5.00	G1(Φ) (back)	3.10	3.30
W4	0.80	1.20	L2	3.60	4.00	T1	1.45	1.65			

Note: The values in () are reference values. Size does not include burrs and mold flash