1200V N-Channel MOSFET

FEATURES

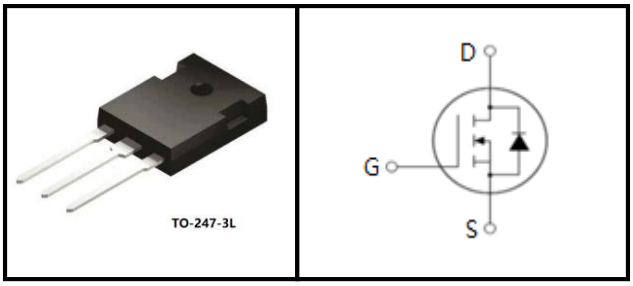
- Low On-Resistance
- Low Capacitance
- Avalanche Ruggedness
- Halogen Free, RoHS Compliant

BENEFITS

- Higher System Efficiency
- Parallel Device Convenience
- High Temperature Application
- High Frequency Operation

APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Power Factor Correction (PFC)
- Uninterruptible Power Supply (UPS)
- EV Charging station & Motor Drives
- Solar/ Wind Renewable Energy
- Power Inverters & DC/DC Converters



Device Marking and Package Information

Device	Package	Marking
C2M120W080	TO-247-3L	C2M120W080

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value	Unit
Drain-Source Voltage	V_{DSS}	VGS=0V, IDS=100μA	1200	V
Continuous Drain Current	I_D	VGS=20V, TC=25° C	36	A
		VGS=20V, TC=110° C	22	
Pulsed Drain Current	I_{DM}	t_{PW} limitation per Fig.17	138	
Single Pulse Avalanche Energy	E_{AS}	VDD=100V, ID=10A	1250	mJ
Power Dissipation	P_D	TC=25° C	208	W
Recommend Gate Source Voltage	$V_{GS, op}$		-5/+20	V
Maximum Gate Source Voltage	$V_{GS, max}$		-10/+25	
Soldering Temperature	T_L		260	ºC
Operating Junction and Storage Temperature Range	T_J, T_{stg}		-55/+150	

Specifications T_J = 25ºC, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 100μA	1200	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 1200V, V_{GS} = 0V, T_J = 25ºC	--	<1	50	μA
		V_{DS} = 1200V, V_{GS} = 0V, T_J = 150ºC	--	5	200	
Gate-Source Leakage	I_{GSS}	V_{GS} = 20V， V_{DS} = 0V	--	--	250	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = 10V, I_D = 10mA	--	2.4	--	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 20V, I_D = 18A	--	80	96	mΩ
		VGS = 20V, ID = 18A, TJ = 150ºC	--	105	--	
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 800V, f = 1.0MHz V_{AC}=25mV	--	1303	--	pF
Output Capacitance	C_{oss}		--	367	--	
Reverse Transfer Capacitance	C_{rss}		--	53	--	
Effective Output Capacitance, Energy Related	$C_{o(er)}$	V_{GS}=0V, V_{DS}=0 to 800V		131		
Effective Output Capacitance, Time Related	$C_{o(tr)}$	I_D=const., V_{GS}=0V, V_{DS}=0 to 800V		180		
Total Gate Charge	Q_g	V_{DD} = 800V, I_D= 18A, V_{GS}= -5 to 20V	--	96	--	nC
Gate-Source Charge	Q_{gs}		--	15	--	
Gate-Drain Charge	Q_{gd}		--	45	--	
Gate plateau voltage	Vpl		--	11.2	--	V
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=800V, V_{GS}=-4/20V, I_D=18A, R_L=40Ω, $R_{G(ext)}$= 2.7 Ω	--	55.5	--	ns
Turn-on Rise Time	t_r		--	153	--	
Turn-off Delay Time	$t_{d(off)}$		--	112	--	
Turn-off Fall Time	t_f		--	91	--	
Coss Stored Energy	Eoss	V_{GS}=0V, V_{DS}=800V f =1MHz, V_{AC}=25mV	--	58*	--	μJ
Turn-on Switching Energy	Eon	V_{DS}=800V, V_{GS}=0/20V, I_D=18A, $R_{G(ext)}$= 2.7 Ω	--	115*	--	
Turn-off Switching Energy	Eoff		--	165*	--	
Internal Gate Resistance	$R_{G(int.)}$	f =1MHz, V_{AC}=25mV	--	5.6	--	Ω

*The energy loss caused by the reverse recovery of FWD is not included in Eon.

Specifications T_J = 25ºC, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Built-in SiC Diode Characteristics						
Continuous Diode Forward Current	I_S	VGS=-5V, TC=25° C	--	33	--	A
Inverse Diode Forward Voltage	V_{SD}	I_S = 10.8A, V_{GS} = -5V	--	5.4	--	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V, I_F = 18A, V_{DS}=800V, di_F/dt =300A /µs	--	40	--	ns
Reverse Recovery Charge	Q_{rr}		--	43	--	nC
Peak Reverse Recovery Current	Irrm		--	1.8	--	A

Thermal Resistance			
Parameter	**Symbol**	**Value**	**Unit**
Thermal Resistance, Junction-to-Case	R_{thJC}	0.6	K/W

Typical Device Performance

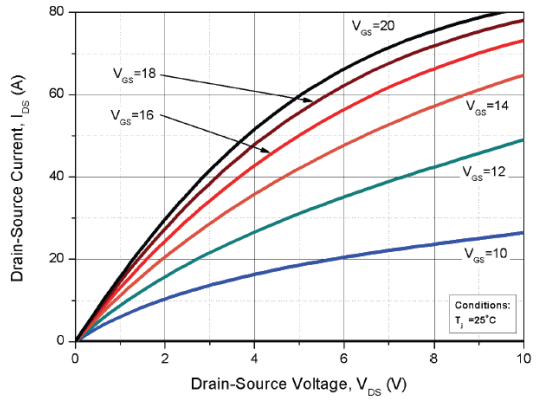


Fig. 1 Forward Output Characteristics at T_j = 25°C

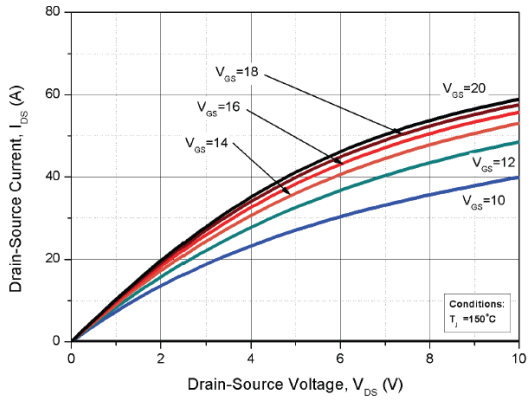


Fig. 2 Forward Output Characteristics at T_j = 150°C

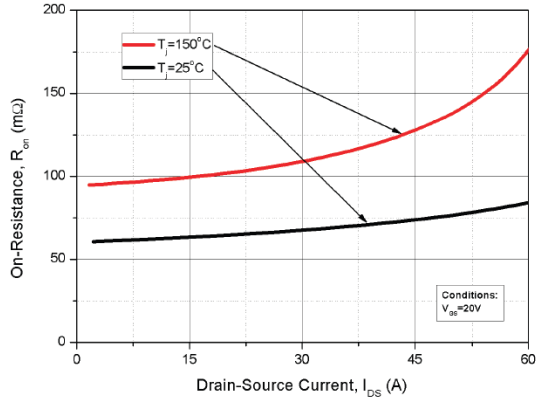


Fig. 3 On-Resistance vs. Drain Current for Various T_j

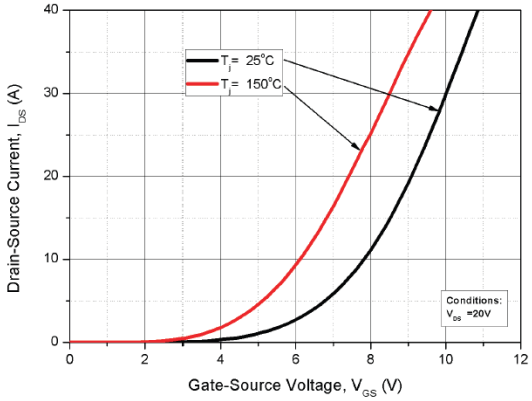


Fig. 4 Transfer Characteristics for Various T_j

Typical Device Performance

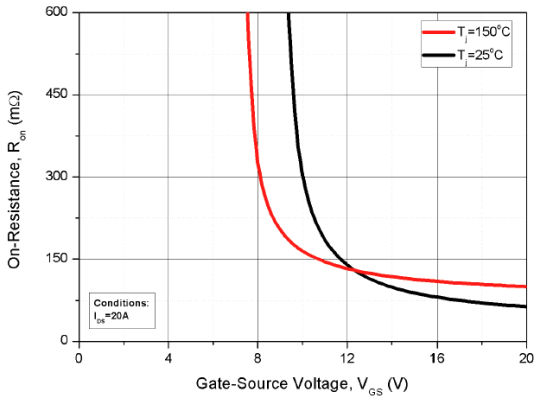


Fig. 5 On-Resistance vs. Gate Voltage for Various T_j

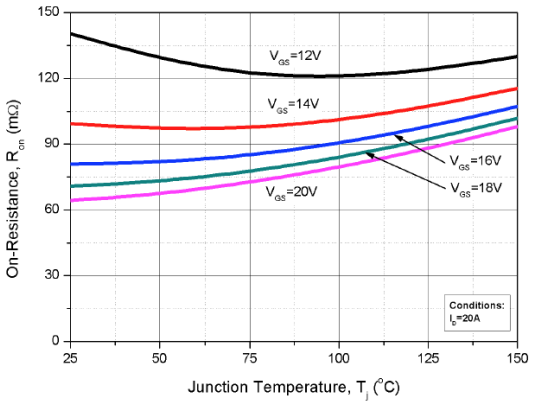


Fig. 6 On-Resistance vs. Temperature for Various Gate Voltage

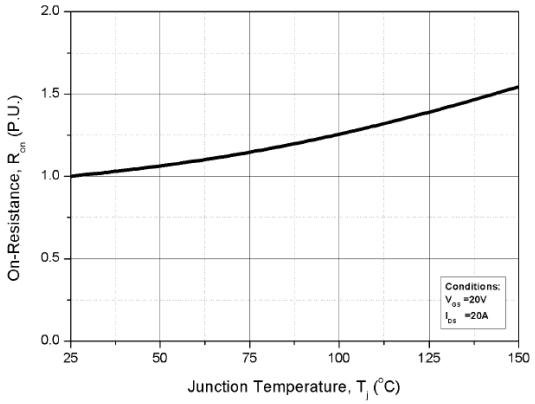


Fig. 7 Normalized On-Resistance vs. Temperature

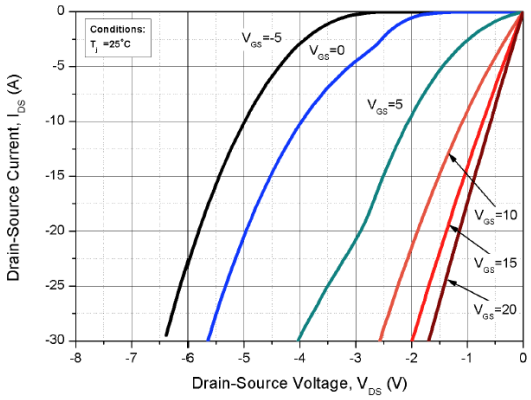


Fig. 8 Reverse Output Characteristics at T_j = 25°C

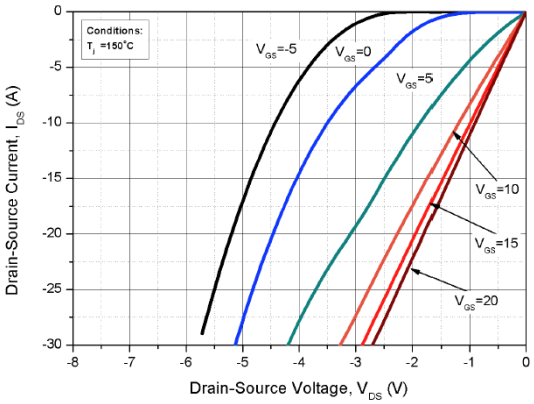


Fig. 9 Reverse Output Characteristics at T_j = 150°C

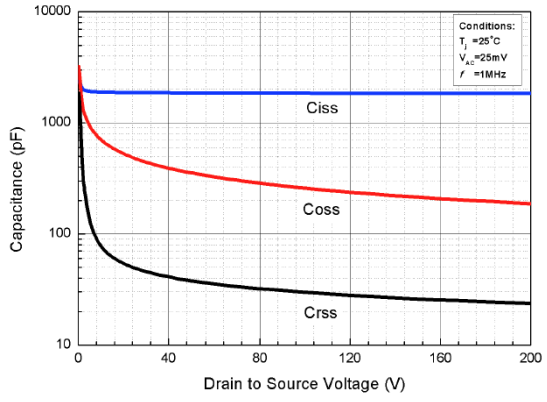


Fig. 10 Capacitances vs. Drain to Source Voltage (0 - 200V)

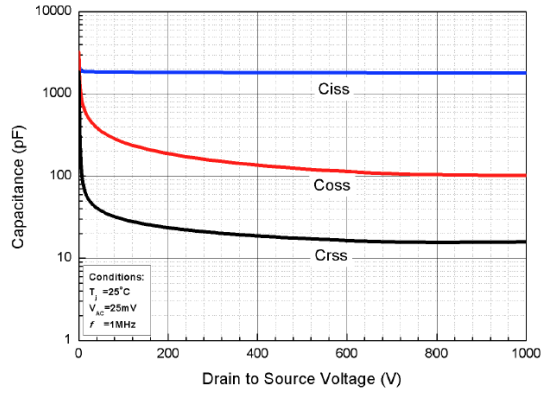


Fig. 11 Capacitances vs. Drain to Source Voltage (0 - 1000V)

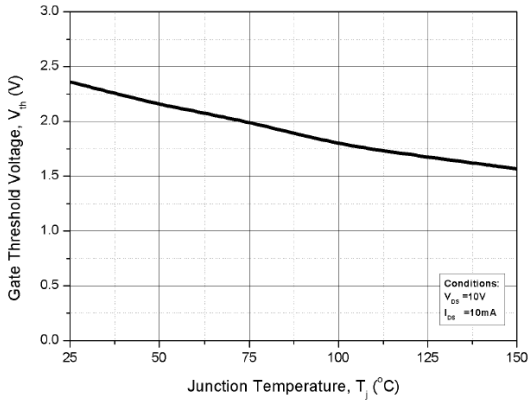


Fig. 12 Threshold Voltage vs. Temperature

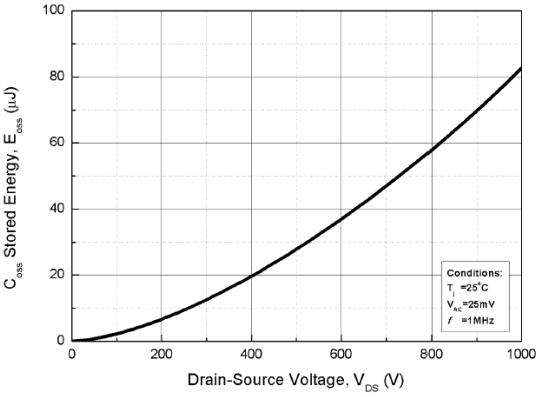


Fig. 13 Output Capacitor Stored Energy*

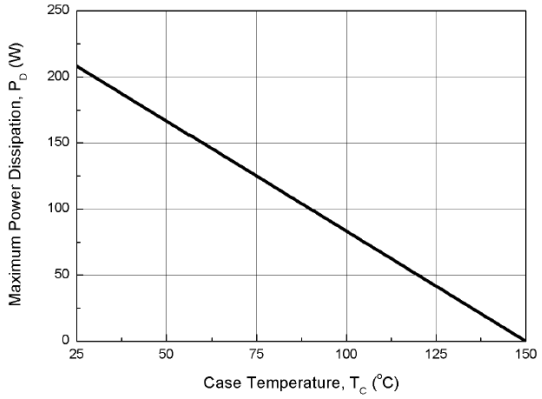


Fig. 14 Maximum Power Dissipation Derating vs. Case Temperature

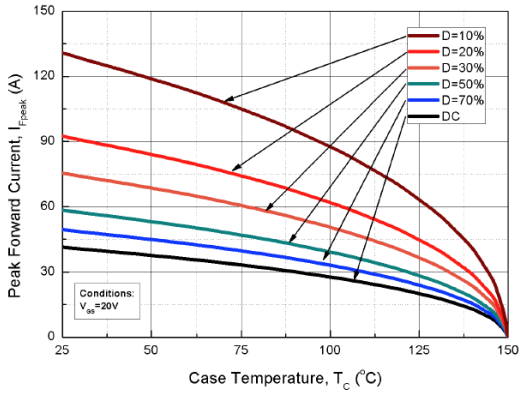


Fig. 15 Drain Current Derating vs. Case Temperature

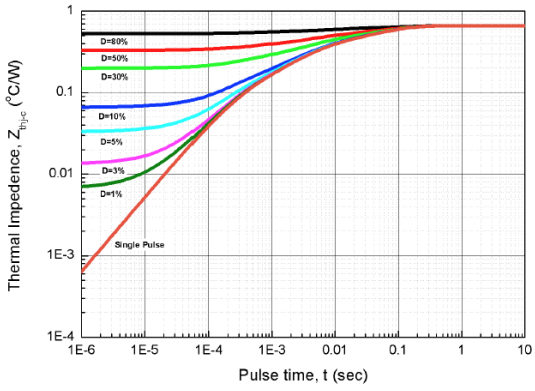


Fig. 16 Transient Junction to Case Thermal Impedance

Typical Device Performance

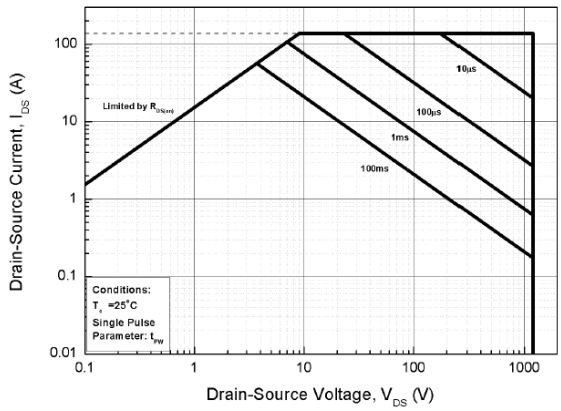


Fig. 17 Safe Operating Area

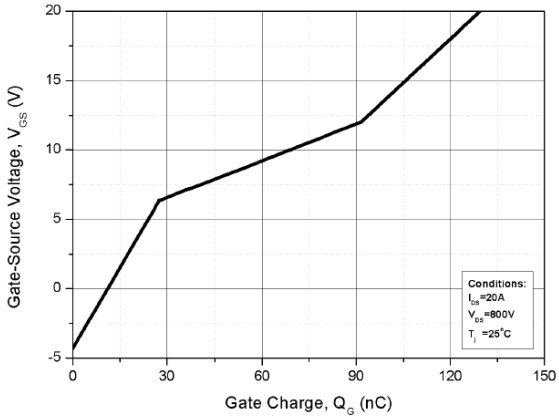


Fig. 18 Gate Charge Characteristics

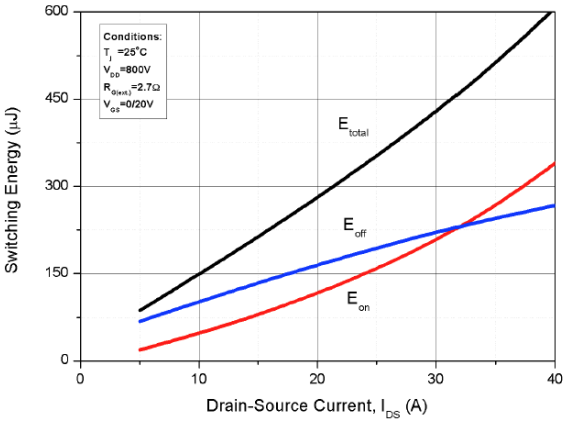


Fig. 19 Clamped Inductive Switching Energy vs. Drain Current (V_{DD}=800V)*

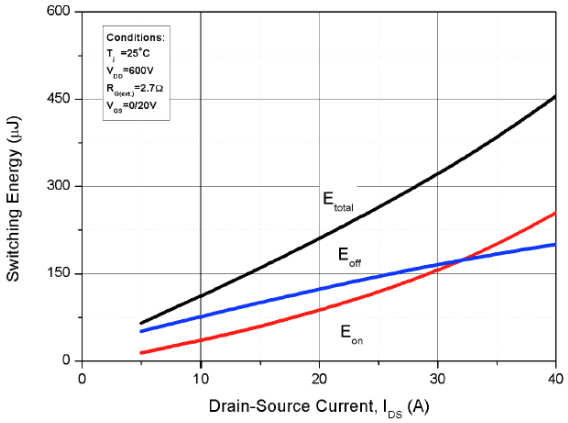


Fig. 20 Clamped Inductive Switching Energy vs. Drain Current (V_{DD}=600V)*

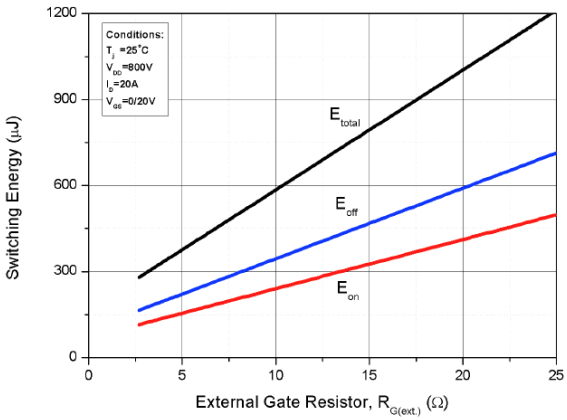
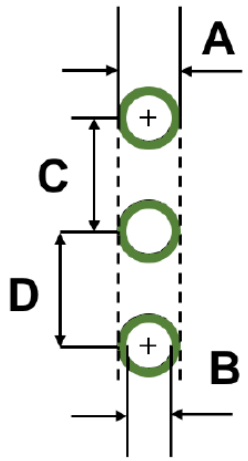


Fig. 21 Clamped Inductive Switching Energy vs. External Gate Resistor ($R_{G(ext.)}$)*

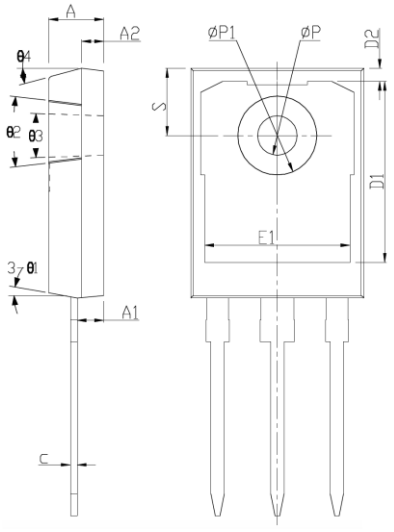
*Base on the results of calculation, note that the energy loss caused by the reverse recovery of FWD is not included in Eon.

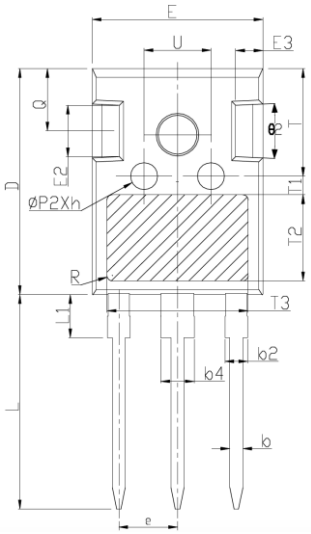
Recommended Solder Pad Layout (TO-247-3L)



Mechanical Parameters			
Parameter	Symbol	Typical	Unit
Length	A	3.048	mm
	B	2.032	
	C	5.436	
	D	5.436	

Mechanical Parameters





NOTES:
1.All dimensions are in mm.
2.Tolerance: ±0.05mm.

SYMBOL	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	4.75	5.00	5.25
A1	2.16	2.41	2.66
A2	1.85	2.00	2.15
b	1.11	1.21	1.35
b2	1.90	2.01	2.25
b4	2.90	3.01	3.25
c	0.51	0.61	0.75
D	20.60	21.00	21.40
D1	16.15	16.55	16.95
D2	1.00	1.20	1.40
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.70	5.00	5.30
E3	2.25	2.50	2.75
e	5.44BSC		
h	0.00	0.10	0.25
L	19.52	19.92	20.32
L1	-	-	4.30
ΦP	3.35	3.60	3.85
ΦP1	-	-	7.30
ΦP2	2.25	2.50	2.75
Q	5.50	5.80	6.10
S	6.15BSC		
R	0.50REF		
T	9.70	-	10.30
T1	1.65REF		
T2	8.00REF		
T3	12.80REF		
U	5.90	-	6.50
θ1	4°	7°	10°
θ2	2°	5°	8°
θ3	1°	-	2°
θ4	10°	15°	20°

*The information provided herein is subject to change without notice.

Disclaimer

All product specifications and data are subject to change without notice.

For documents and material available from this datasheet, Suzhou Convert does not warrant or assume any legal liability or responsibility for the accuracy, completeness of any product or technology disclosed hereunder.

No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document or by any conduct of Suzhou Convert.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless. Customers using or selling Suzhou Convert products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Suzhou Convert for any damages arising or resulting from such use or sale.

Suzhou Convert disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Suzhou Convert's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

Suzhou Convert SemiConductor CO., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

In the event that any or all Suzhou Convert products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. Suzhou Convert believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET ***category:***

Click to view products by Convert Semiconductor ***manufacturer:***

Other Similar products are found below :

614233C 648584F MCH3443-TL-E MCH6422-TL-E FDPF9N50NZ FW216A-TL-2W FW231A-TL-E APT5010JVR NTNS3A92PZT5G IRF100S201 JANTX2N5237 2SK2464-TL-E 2SK3818-DL-E FCA20N60_F109 FDZ595PZ STD6600NT4G FSS804-TL-E 2SJ277-DL-E 2SK1691-DL-E 2SK2545(Q,T) D2294UK 405094E 423220D MCH6646-TL-E TPCC8103,L1Q(CM 367-8430-0972-503 VN1206L 424134F 026935X 051075F SBVS138LT1G 614234A 715780A NTNS3166NZT5G 751625C 873612G IRF7380TRHR IPS70R2K0CEAKMA1 RJK60S3DPP-E0#T2 RJK60S5DPK-M0#T0 APT5010JVFR APT12031JFLL APT12040JVR DMN3404LQ-7 NTE6400 JANTX2N6796U JANTX2N6784U JANTXV2N5416U4 SQM110N05-06L-GE3 SIHF35N60E-GE3