PJQ5439E-AU_R2_006A1-VB Datasheet

P-Channel 30 V (D-S) MOSFET

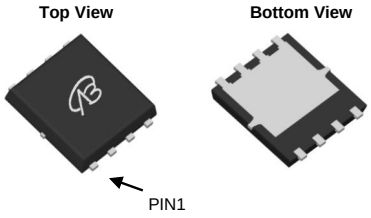
PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D [a]	Q_g (Typ.)
- 30	0.0080 at V_{GS} = - 10 V	- 60	66 nC
	0.0090 at V_{GS} = - 6 V	- 53	
	0.0120 at V_{GS} = - 4.5 V	- 50	

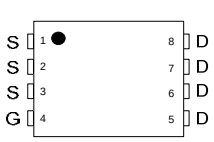
FEATURES

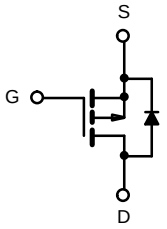
- Extended V_{GS} range (± 25 V) for adaptor switch applications
- Extremely low $R_{DS(on)}$
- Trench Power MOSFET
- 100 % R_g and UIS Tested

Pb-free
RoHS COMPLIANT

DFN5X6







P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	- 30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	- 60	A
	T_C = 70 °C		- 50.7	
	T_A = 25 °C		- 47.3	
	T_A = 70 °C		- 43.9 [b, c]	
Pulsed Drain Current (t = 300 µs)		I_{DM}	- 150	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	- 58 [b, c]	
	T_A = 25 °C		- 46 [b, c]	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	- 40	
Single Pulse Avalanche Energy		E_{AS}	80	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	75	W
	T_C = 70 °C		40	
	T_A = 25 °C		3.1 [b, c]	
	T_A = 70 °C		2 [b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient [b, d]	t ≤ 10 s	R_{thJA}	33	40	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	15	17	

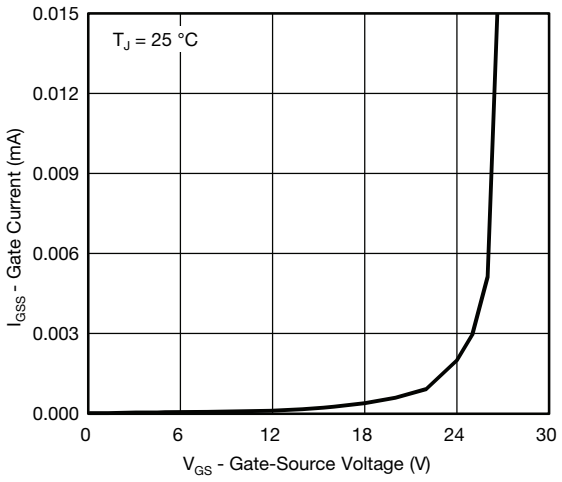
Notes:
a. Based on T_C = 25 °C.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 10 s.
d. Maximum under steady state conditions is 90 °C/W.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 24		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			6		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = - 250 µA	- 1.0		- 2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 25 V			± 150	µA
		V_{DS} = 0 V, V_{GS} = ± 20 V			± 15	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 30 V, V_{GS} = 0 V			- 1	
		V_{DS} = - 30 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \leq$ - 5 V, V_{GS} = - 10 V	- 20			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 13 A		0.0080		Ω
		V_{GS} = - 6 V, I_D = - 10 A		0.0090		
		V_{GS} = - 4.5 V, I_D = - 8 A		0.0120		
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 13 A		44		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 15 V, V_{GS} = 0 V, f = 1 MHz		4620		pF
Output Capacitance	C_{oss}			880		
Reverse Transfer Capacitance	C_{rss}			820		
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 10 V, I_D = - 17.3 A		102	153	nC
		V_{DS} = - 15 V, V_{GS} = - 5 V, I_D = - 17.3 A		66	80	
Gate-Source Charge	Q_{gs}			16		
Gate-Drain Charge	Q_{gd}			28		
Gate Resistance	R_g	f = 1 MHz	0.3	1.3	2.6	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 0 V, R_L = 1.5 Ω $I_D \cong$ - 10 A, V_{GEN} = - 4.5 V, R_g = 1 Ω		70	105	ns
Rise Time	t_r			70	105	
Turn-Off Delay Time	$t_{d(off)}$			45	68	
Fall Time	t_f			27	41	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 15 V, R_L = 1.5 Ω $I_D \cong$ - 10 A, V_{GEN} = - 10 V, R_g = 1 Ω		18	30	
Rise Time	t_r			15	25	
Turn-Off Delay Time	$t_{d(off)}$			52	80	
Fall Time	t_f			14	25	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 5.8	A
Pulse Diode Forward Current	I_{SM}				- 60	
Body Diode Voltage	V_{SD}	I_S = - 10 A, V_{GS} = 0 V		- 0.78	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 10 A, dI/dt = 100 A/µs, T_J = 25 °C		35	53	ns
Body Diode Reverse Recovery Charge	Q_{rr}			25	38	nC
Reverse Recovery Fall Time	t_a			19		ns
Reverse Recovery Rise Time	t_b			16		

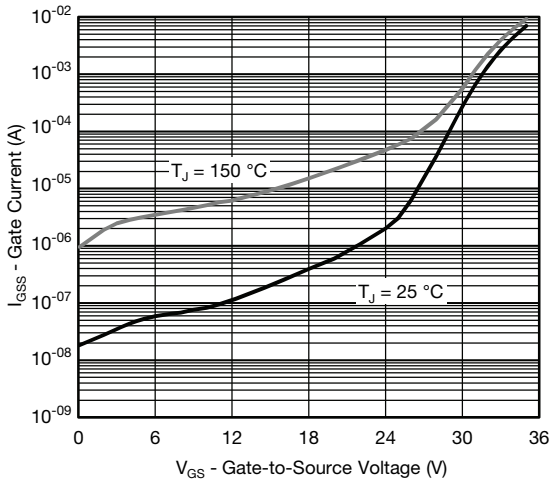
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

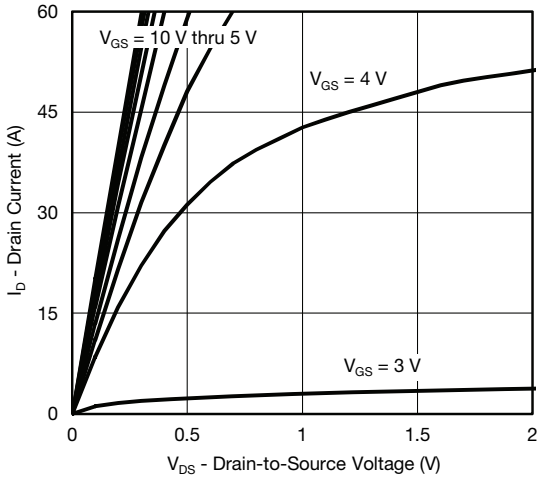
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



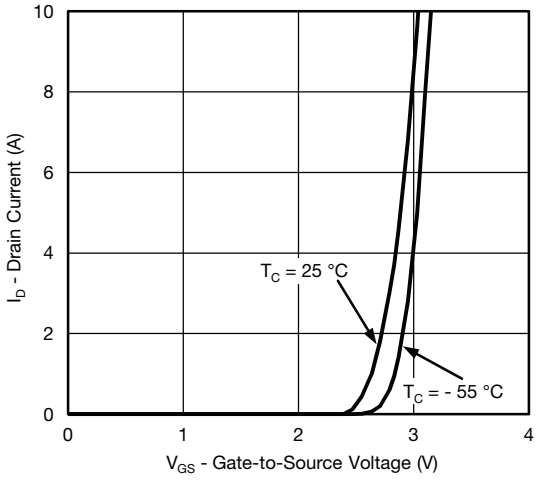
Gate Current vs. Gate-Source Voltage



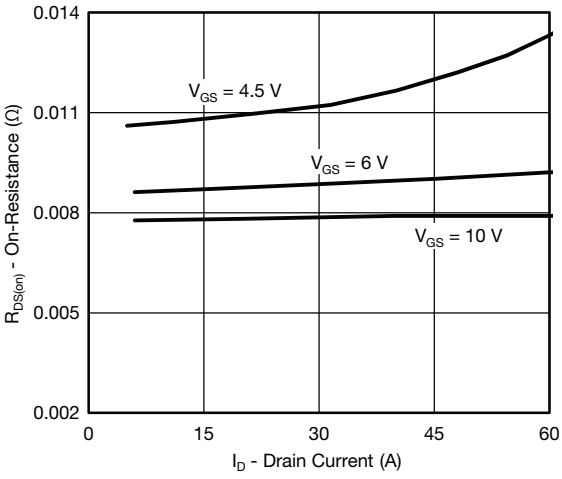
Gate Current vs. Gate-Source Voltage



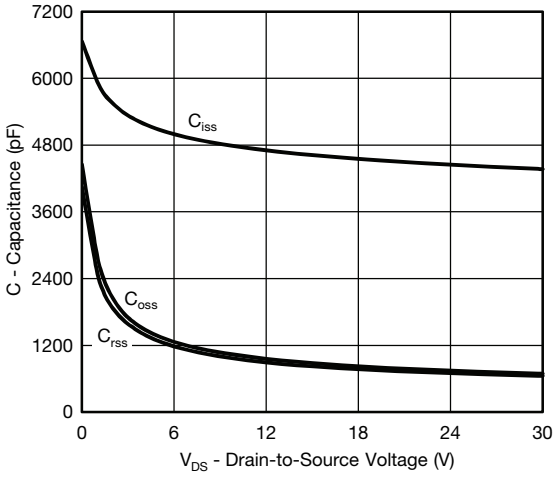
Output Characteristics



Transfer Characteristics

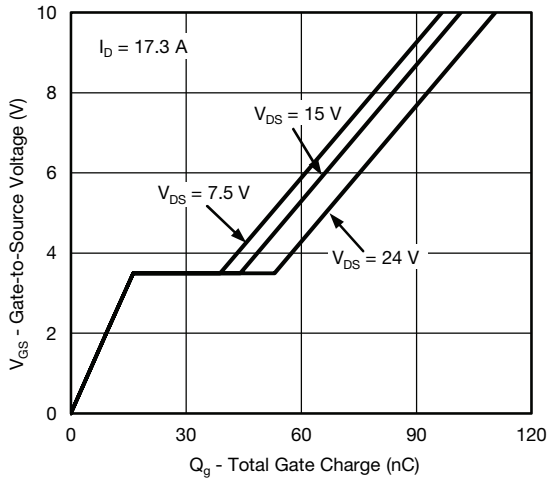


On-Resistance vs. Drain Current

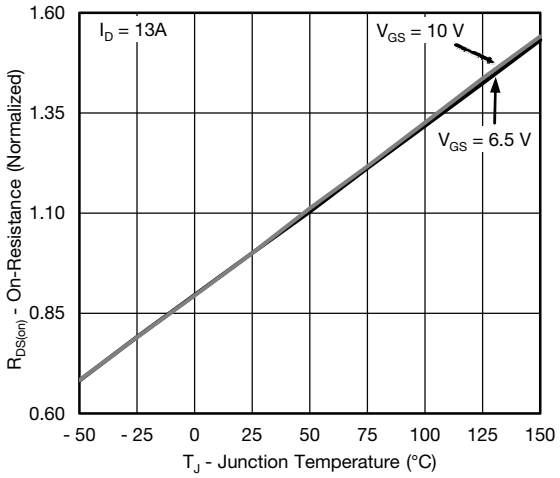


Capacitance

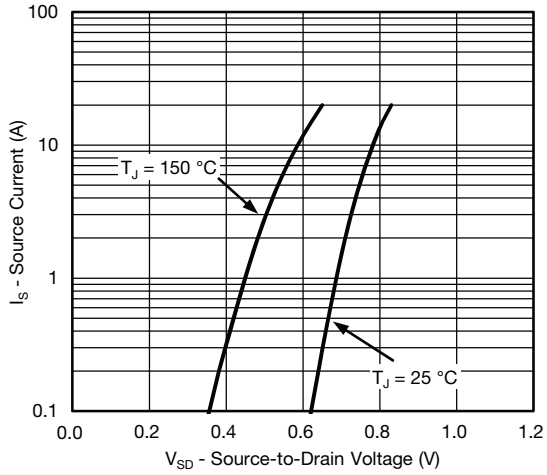
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



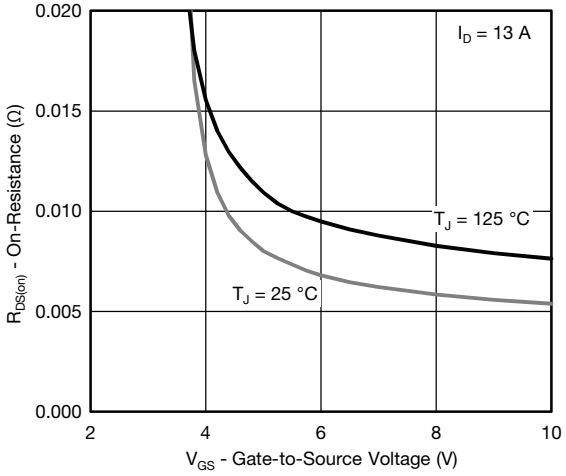
Gate Charge



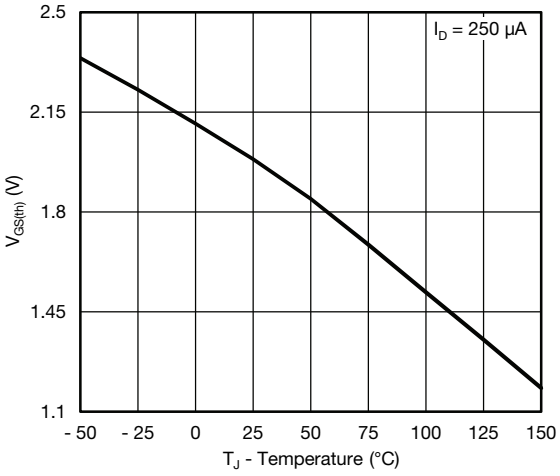
On-Resistance vs. Junction Temperature



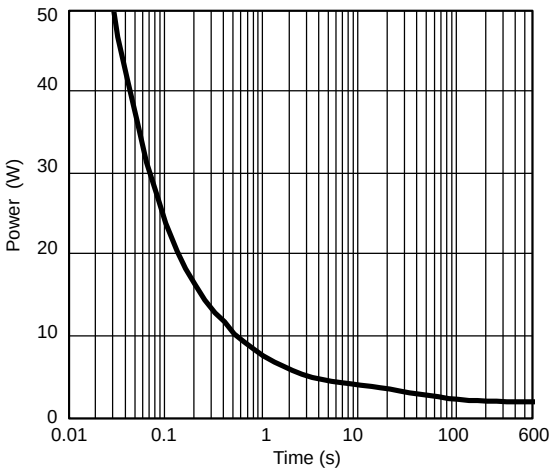
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

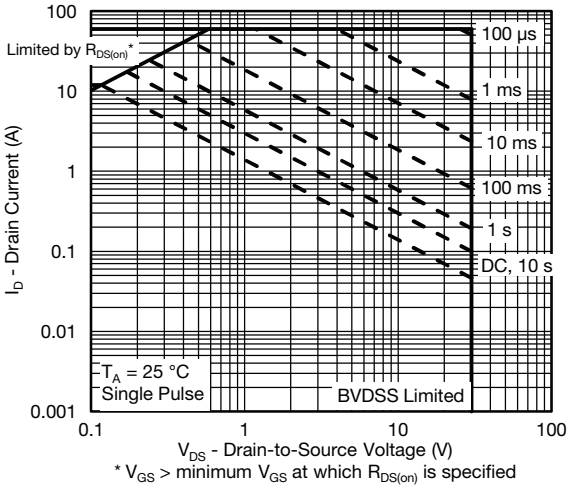


Threshold Voltage

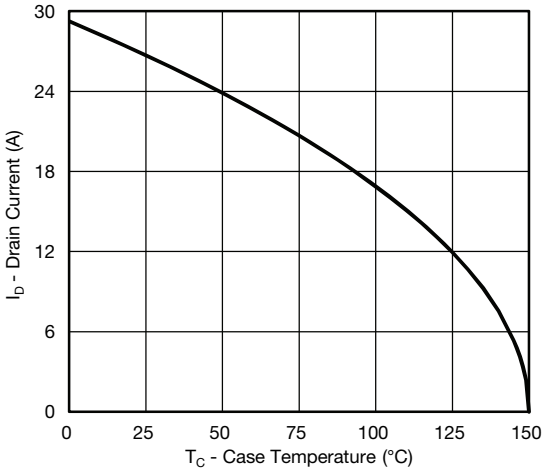


Single Pulse Power, Junction-to-Ambient

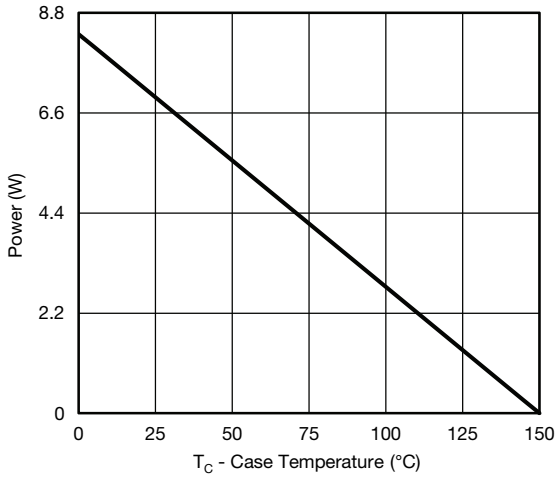
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



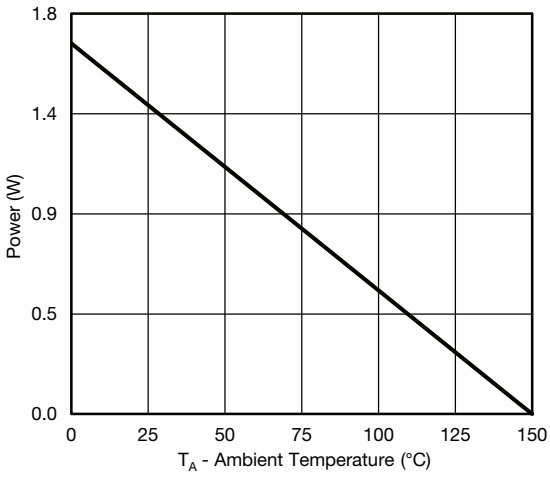
Safe Operating Area, Junction-to-Ambient



Current Derating*



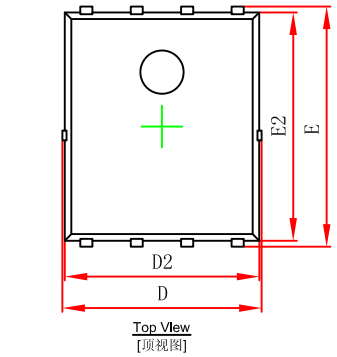
Power Junction-to-Foot

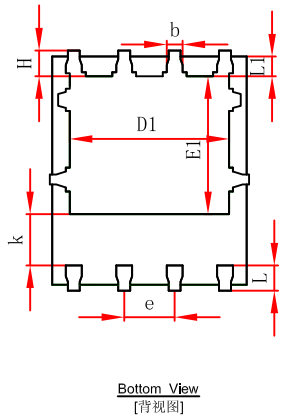


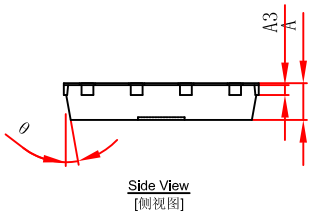
Power Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max.)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

PDFNWB5x6-8L Package Outline Dimensions

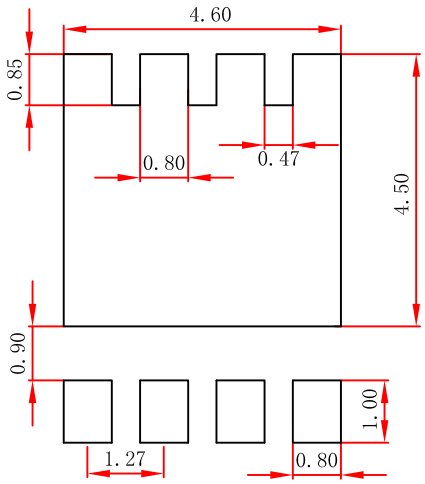






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.	0.	0.	0.
L1	5590.	7110.	0220.	0280.
H	4240.	5760.	0170.	0230.
θ	574 10°	726 12°	023 10°	029 12°

PDFNWB5x6-8L Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

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