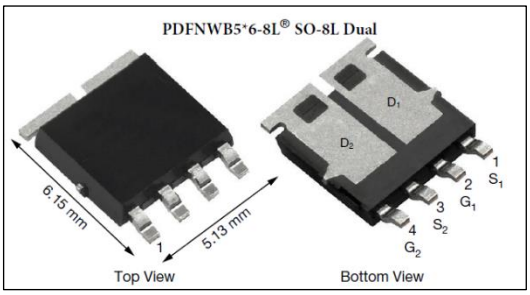
SHENZHEN CLOUDCHILD TECHNOLOGY CO., LTD

PDFNWB5×6-8L Plastic-Encapsulate MOSFETS

CCM2E30D04T N- and P-Channel Power MOSFET

PRODUCT SUMMARY		
	N-CHANNEL	P-CHANNEL
V_{DS} (V)	40	-40
$R_{DS(on)}$ (mΩ) at V_{GS} = ± 10 V	7.5	26
$R_{DS(on)}$ (mΩ) at V_{GS} = ± 4.5 V	9.5	38
I_D (A)	30	-30
Configuration	N- and P-Pair	



DESCRIPTION

The CCM2E30D04T provides excellent $R_{DS(ON)}$ with low gate charge.

It can be used in a wide variety of applications.

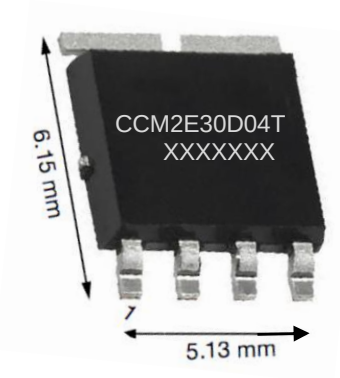
FEATURES

- TrenchFET® Power MOSFET
- AEC-Q101 Qualified[d]
- 100 % R_g and UIS Tested

APPLICATIONS

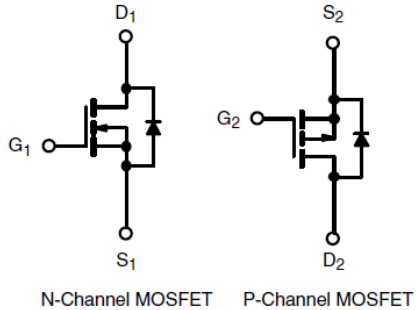
- Solenoid valve drive
- High-frequency switching

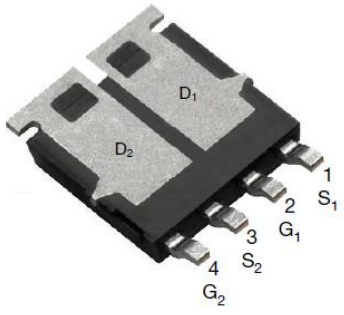
MARKING



CCM2E30D04T = PART MUMBER
CCM= Cloudchild mosfet
2=2PCS MOSFET
E=Packing form
30= ID30A; D=N+P MOSFET; 04=Bvds 40V;
T= Trench
XXXX= manufacture year week;
XXX= N Mosfet wafer LOT NUM

EQUIVALENT CIRCUIT





ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)					
PARAMETER		**SYMBOL**	**N-CHANNEL**	**P-CHANNEL**	**UNIT**
Drain-Source Voltage		V_{DS}	40	-40	V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current[a]	T_C = 25 °C	I_D	30	-30	A
	T_C = 125 °C		30	-20	
Continuous Source Current (Diode Conduction)[a]		I_S	30	-30	
Pulsed Drain Current[b]		I_{DM}	120	-120	
Single Pulse Avalanche Current	L = 0.5 mH	I_{AS}	12	-11.5	
Single Pulse Avalanche Energy		E_{AS}	36	33	mJ
Maximum Power Dissipation[b]	T_C = 25 °C	P_D	48	48	W
	T_C = 125 °C		16	16	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +175		°C
Soldering Recommendations (Peak Temperature)[f]			260		

THERMAL RESISTANCE RATINGS					
PARAMETER		**SYMBOL**	**N-CHANNEL**	**P-CHANNEL**	**UNIT**
Junction-to-Ambient	PCB Mount[c]	R_{thJA}	85	85	°C/W
Junction-to-Case (Drain)		R_{thJC}	3.1	3.1	

Notes

a. Package limited.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
c. When mounted on 1" square PCB (FR4 material).
d. Parametric verification ongoing.
e. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.

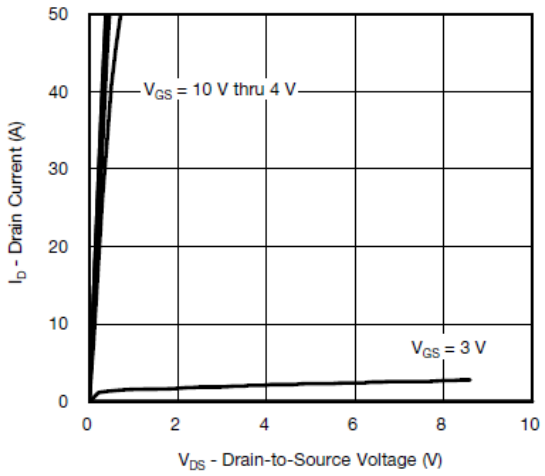
SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)								
PARAMETER	**SYMBOL**	**TEST CONDITIONS**			**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static								
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA		N-Ch	40	-	-	V
		V_{GS} = 0 V, I_D = - 250 µA		P-Ch	-40	-	-	
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA		N-Ch	1.0	1.5	3.0	
		V_{DS} = V_{GS}, I_D = - 250 µA		P-Ch	-1.1	-1.6	-2.2	
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V		N-Ch	-	-	± 100	nA
				P-Ch	-	-	± 100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V	V_{DS} = 40 V	N-Ch	-	-	1	µA
		V_{GS} = 0 V	V_{DS} = -40 V	P-Ch	-	-	-1	
		V_{GS} = 0 V	V_{DS} = 40 V, T_J = 125 °C	N-Ch	-	-	50	
		V_{GS} = 0 V	V_{DS} = -40 V, T_J = 125 °C	P-Ch	-	-	-50	
		V_{GS} = 0 V	V_{DS} = 40 V, T_J = 175 °C	N-Ch	-	-	150	
		V_{GS} = 0 V	V_{DS} = -40 V, T_J = 175 °C	P-Ch	-	-	-150	
On-State Drain Current[a]	$I_{D(on)}$	V_{GS} = 10 V	V_{DS} ≥ 5 V	N-Ch	25	-	-	A
		V_{GS} = -10 V	V_{DS} ≤ 5 V	P-Ch	-25	-	-	
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V	ID = 10A	N-Ch	-	7.5	8.5	mΩ
		V_{GS} = -10 V	ID = -10A	P-Ch	-	26	33	
		V_{GS} = 10 V	ID = 10 A, TJ = 125 °C	N-Ch	-	-	13.4	
		V_{GS} = -10 V	ID = -10 A, TJ = 125 °C	P-Ch	-	-	37	
		V_{GS} = 10 V	ID = 10 A, TJ = 175 °C	N-Ch	-	-	17	
		V_{GS} = -10 V	ID = -10 A, TJ = 175 °C	P-Ch	-	-	45	
		V_{GS} = 4.5 V	ID = 10 A	N-Ch	-	9.5	12.3	
		V_{GS} = -4.5 V	ID = -10 A	P-Ch	-	37	42	
Forward Transconductance[b]	g_{fs}	VDS = 15 V, ID = 10 A		N-Ch	-	65	-	S
		VDS = -15 V, ID = -10 A		P-Ch	-	16	-	
Dynamic[b]								
Input Capacitance	C_{iss}	V_{GS} = 0 V	V_{DS} = 20 V, f = 1 MHz	N-Ch	-	1474	1843	pF
		V_{GS} = 0 V	V_{DS} = -20 V, f = 1 MHz	P-Ch	-	1302	1628	
Output Capacitance	C_{oss}	V_{GS} = 0 V	V_{DS} = 20 V, f = 1 MHz	N-Ch	-	218	273	
		V_{GS} = 0 V	V_{DS} = -20 V, f = 1 MHz	P-Ch	-	222	278	
Reverse Transfer Capacitance	C_{rss}	V_{GS} = 0 V	V_{DS} = 20 V, f = 1 MHz	N-Ch	-	89	111	
		V_{GS} = 0 V	V_{DS} = -20 V, f = 1 MHz	P-Ch	-	154	193	

Total Gate Charge[c]	Q_g	V_{GS} = 10 V	V_{DS} = 20 V, I_D = 10 A	N-Ch	-	25.5	38.3	nC
		V_{GS} = -10 V	V_{DS} = -20 V, I_D = -10 A	P-Ch	-	30.2	45	
Gate-Source Charge[c]	Q_{gs}	V_{GS} = 10 V	V_{DS} = 20 V, I_D = 10 A	N-Ch	-	4.4	-	
		V_{GS} = -10 V	V_{DS} = -20 V, I_D = -10 A	P-Ch	-	4.1	-	
Gate-Drain Charge[c]	Q_{gd}	V_{GS} = 10 V	V_{DS} = 20 V, I_D = 10 A	N-Ch	-	4.3	-	
		V_{GS} = -10 V	V_{DS} = -20 V, I_D = -10 A	P-Ch	-	7.4	-	
Gate Resistance	R_g	f = 1 MHz		N-Ch	0.65	1.37	2.1	Ω
				P-Ch	3.1	6.15	9.5	

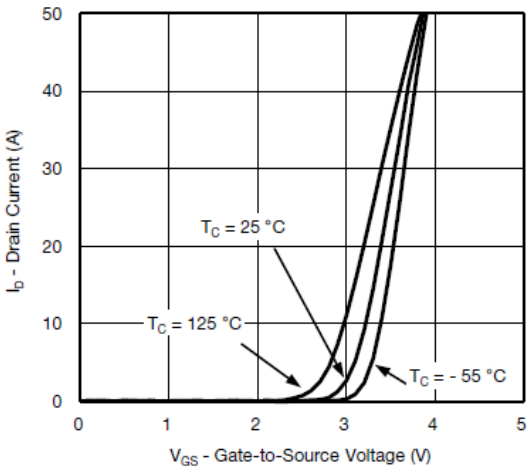
Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

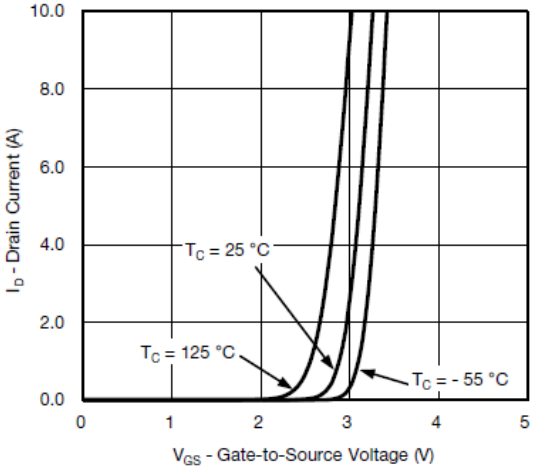
N-CHANNEL TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



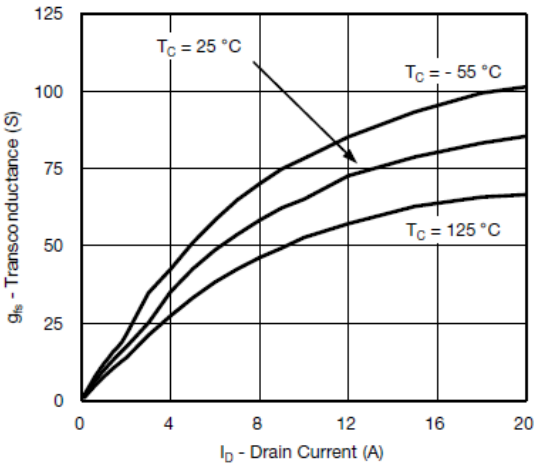
Output Characteristics



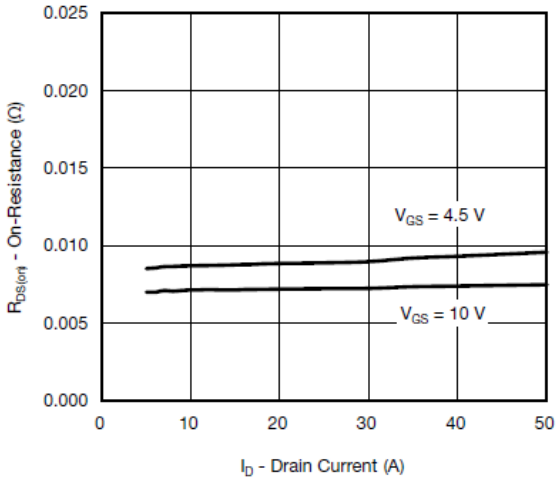
Transfer Characteristics



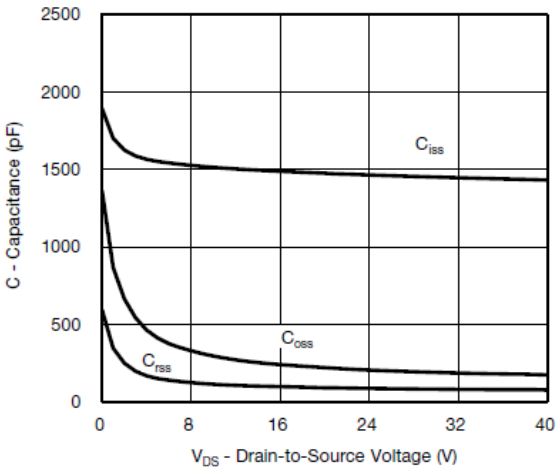
Transfer Characteristics



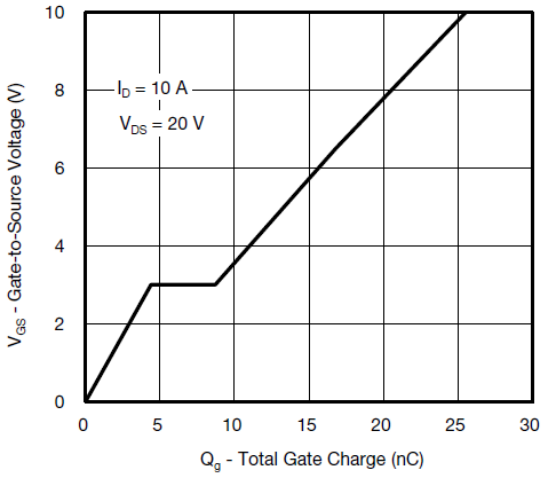
Transconductance



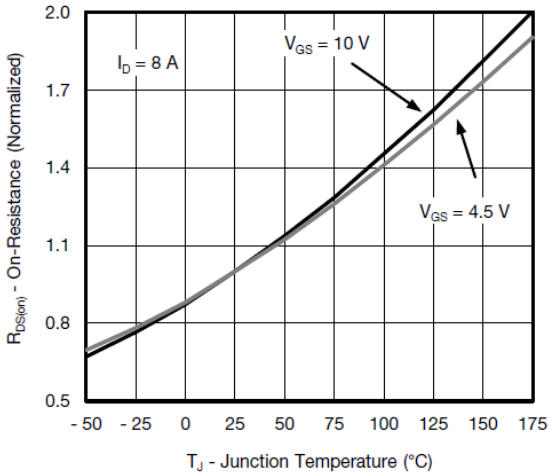
On-Resistance vs. Drain Current



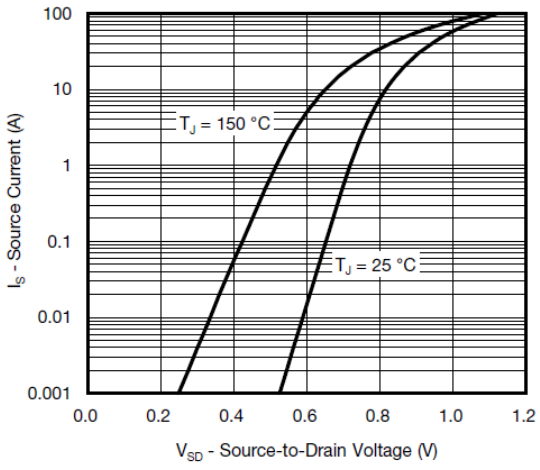
Capacitance



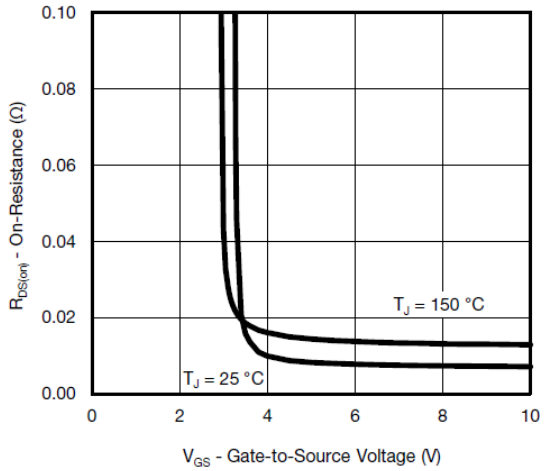
Gate Charge



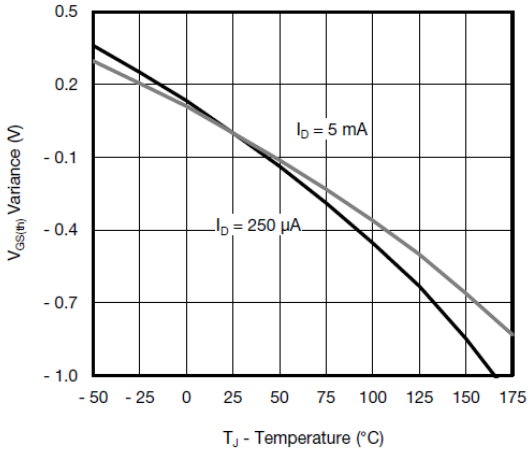
On-Resistance vs. Junction Temperature



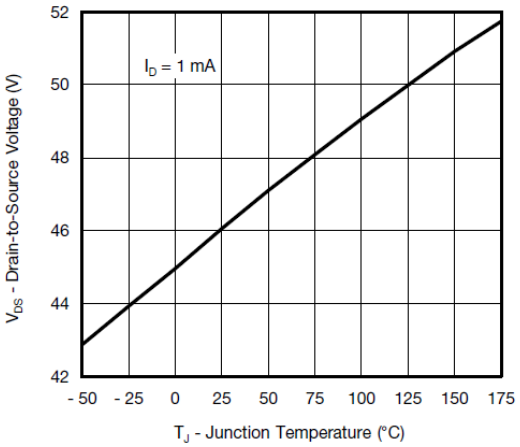
Source Drain Diode Forward Voltage



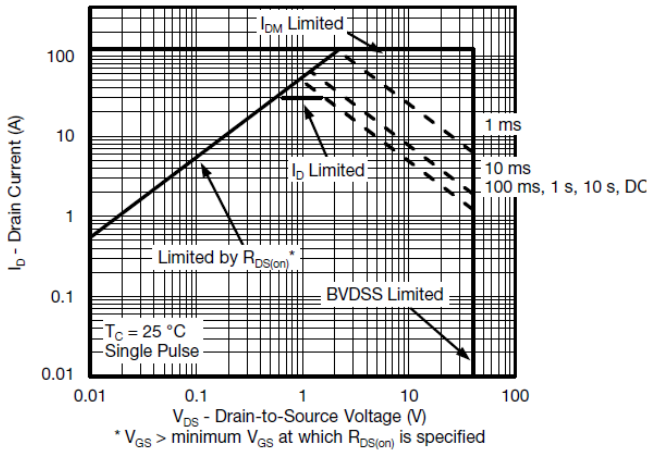
On-Resistance vs. Gate-to-Source Voltage



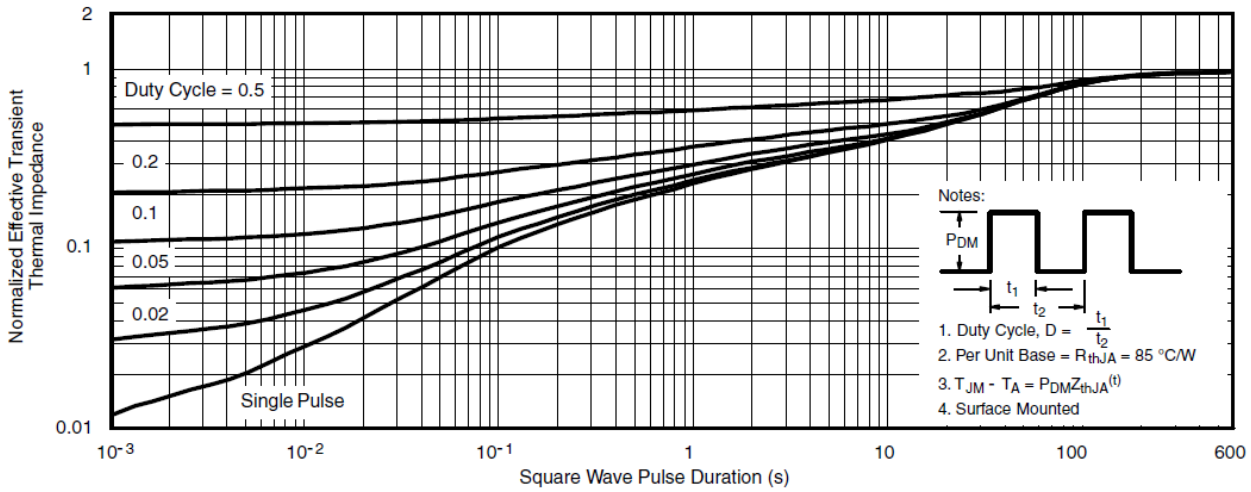
Threshold Voltage



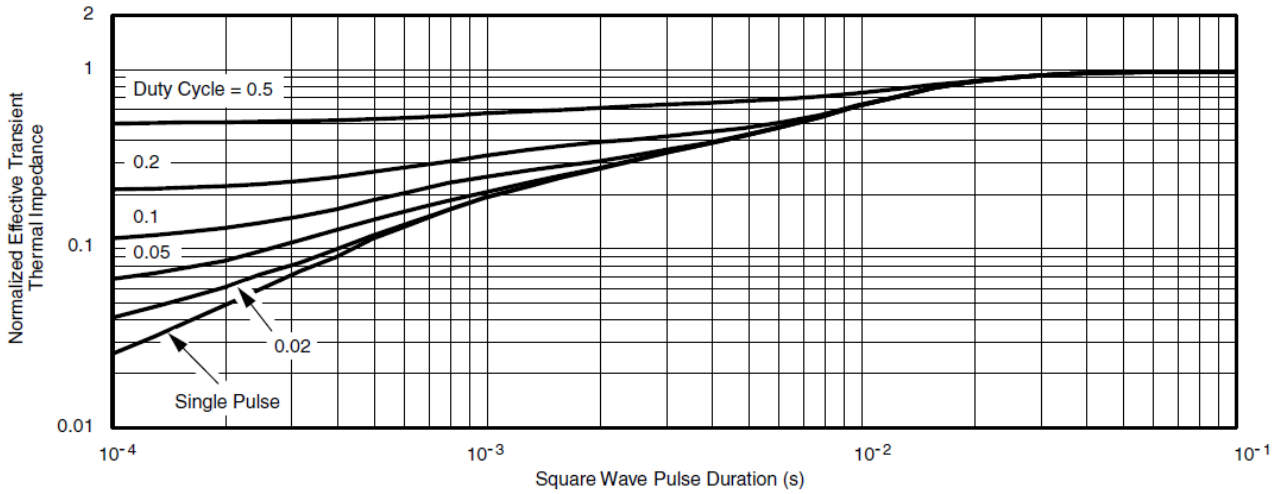
Drain Source Breakdown vs. Junction Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



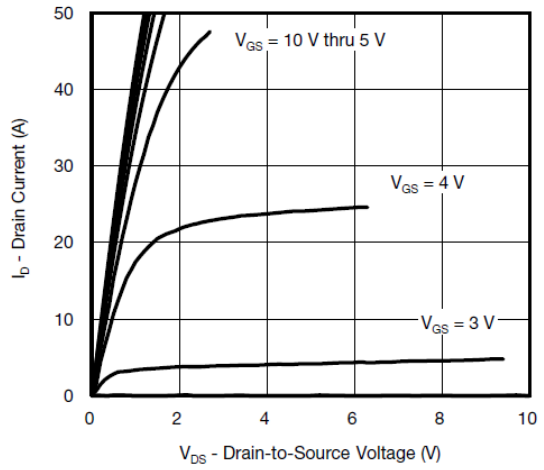
Normalized Thermal Transient Impedance, Junction-to-Case

Note

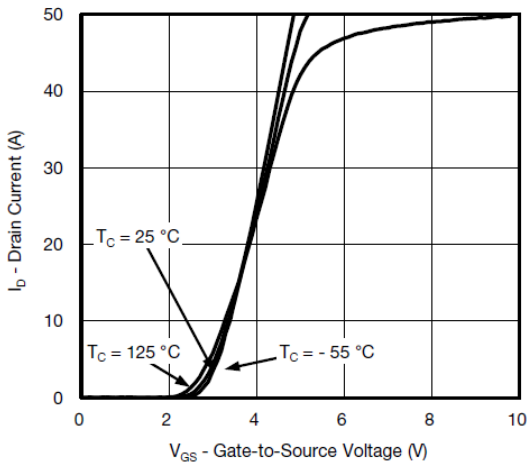
- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
  - Normalized Transient Thermal Impedance Junction-to-Case (25 °C)

are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

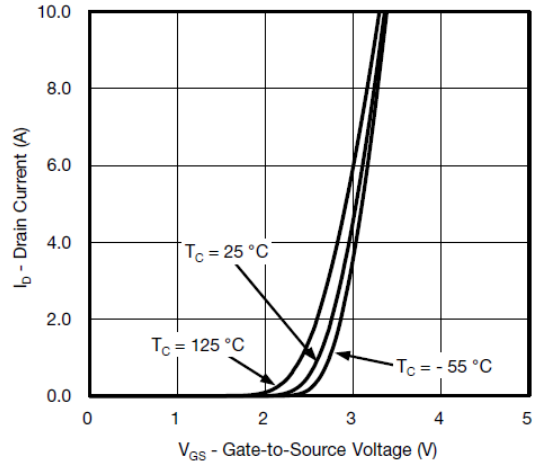
P-CHANNEL TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



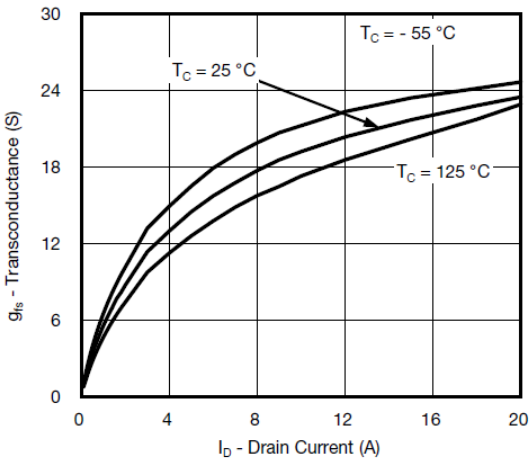
Output Characteristics



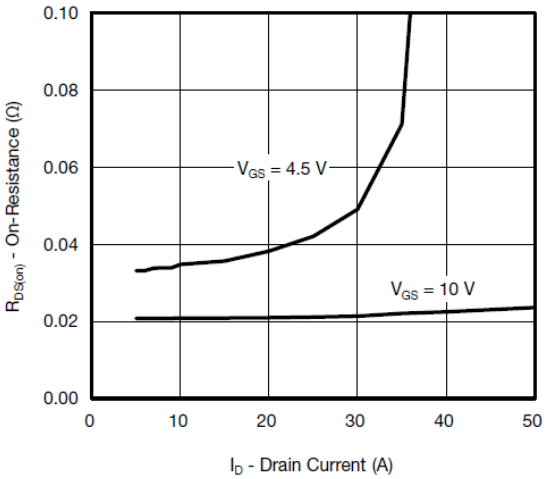
Transfer Characteristics



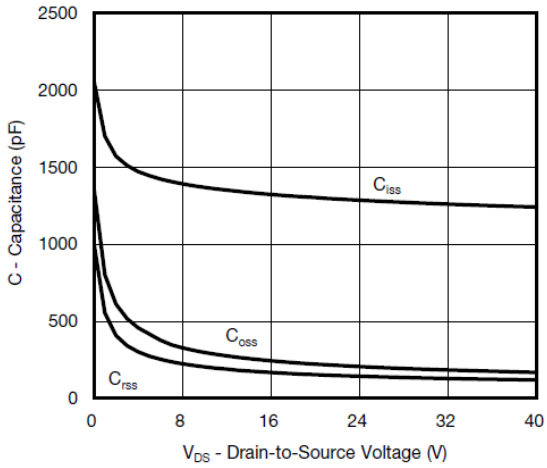
Transfer Characteristics



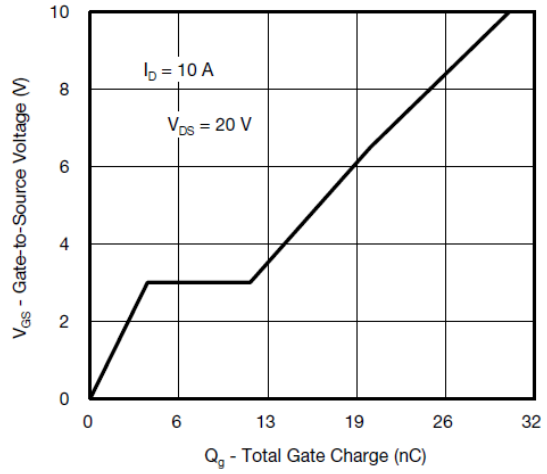
Transconductance



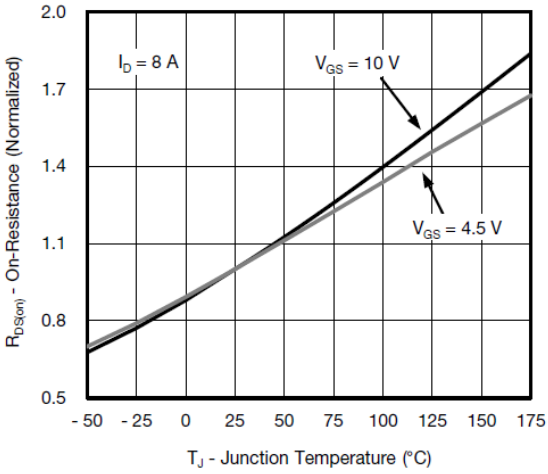
On-Resistance vs. Drain Current



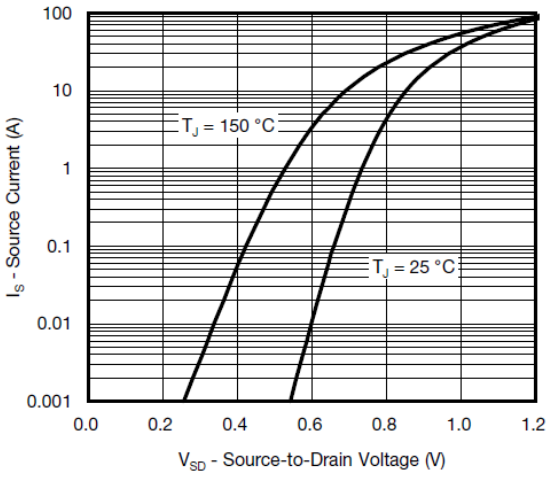
Capacitance



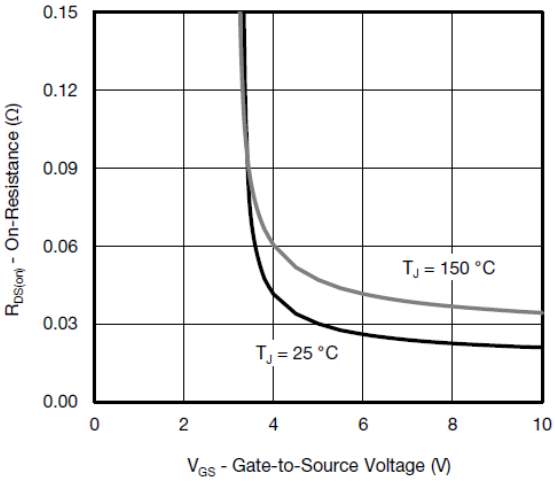
Gate Charge



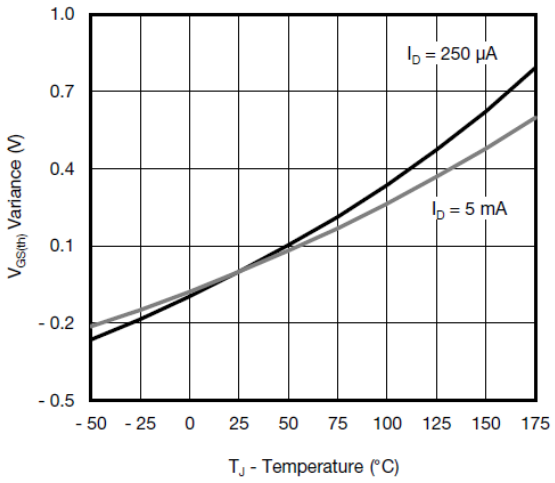
On-Resistance vs. Junction Temperature



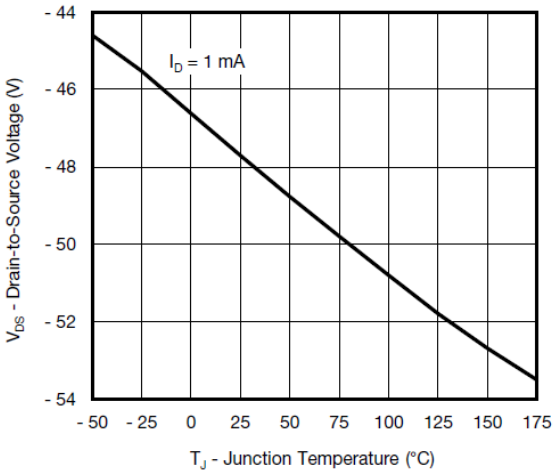
Source Drain Diode Forward Voltage



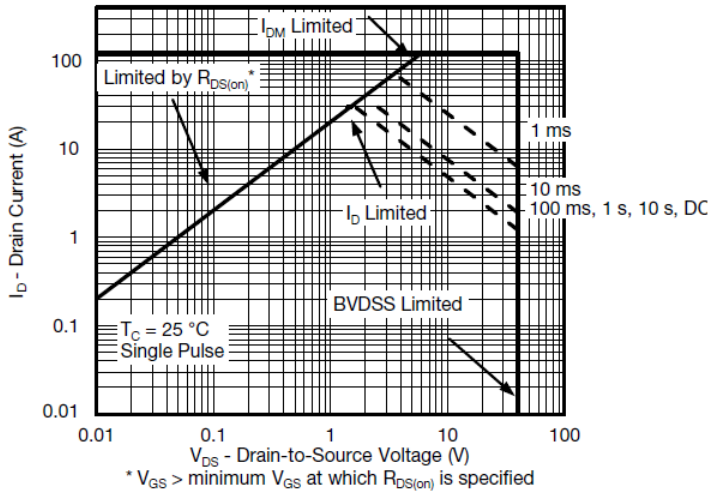
On-Resistance vs. Gate-to-Source Voltage



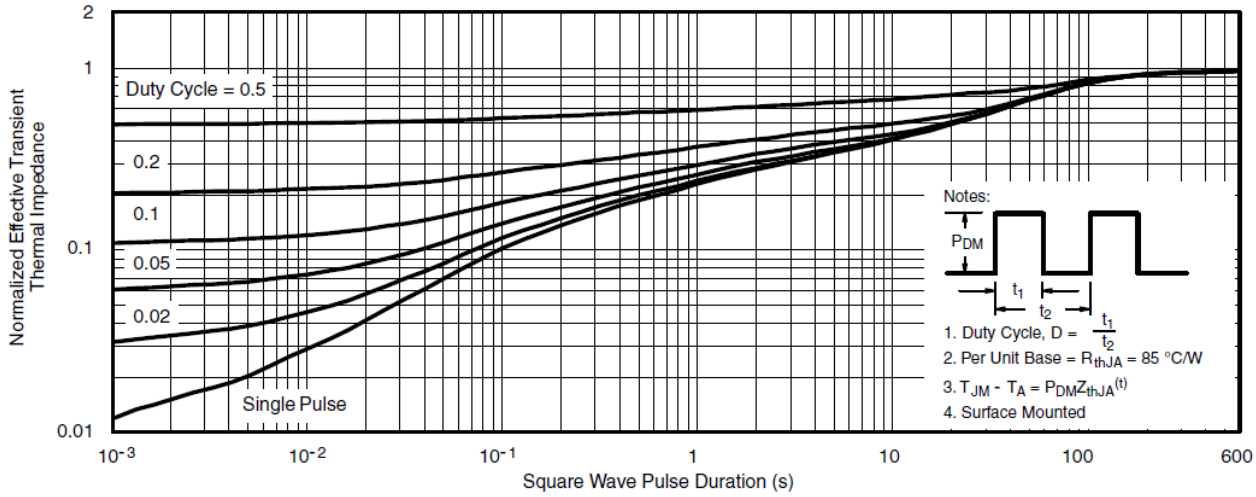
Threshold Voltage



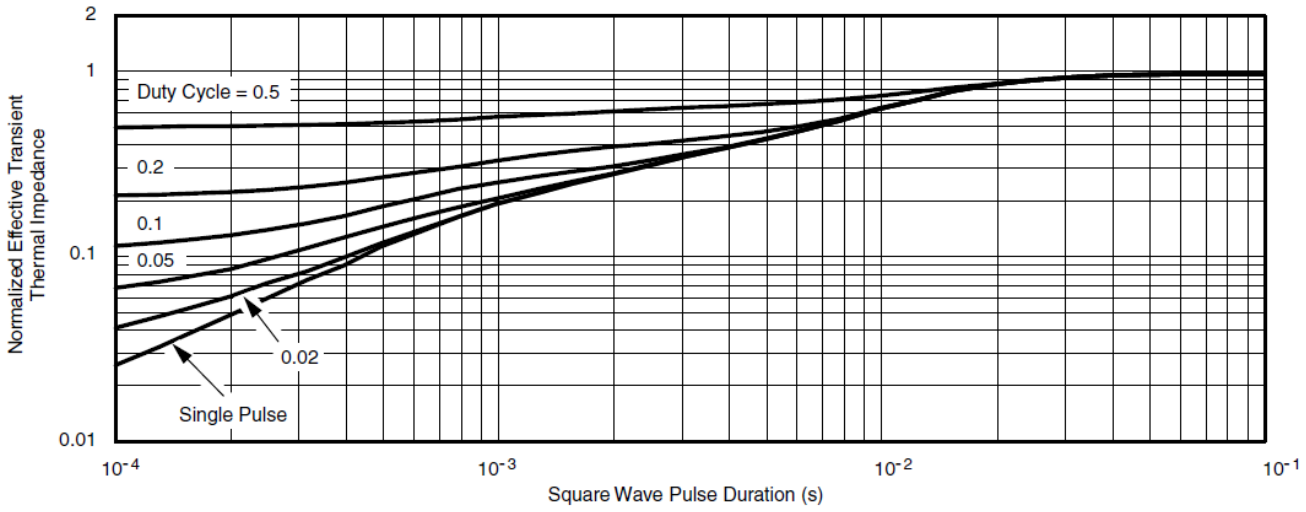
Drain Source Breakdown vs. Junction Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



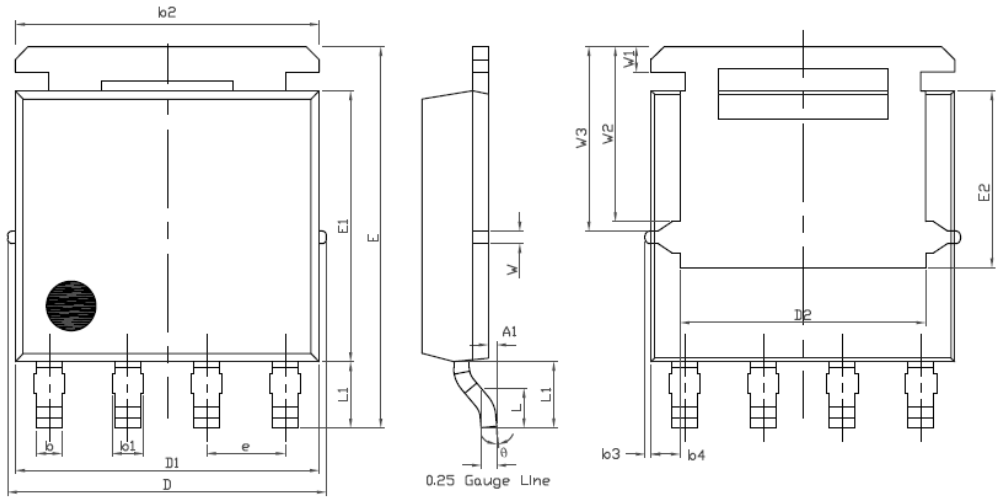
Normalized Thermal Transient Impedance, Junction-to-Case

Note

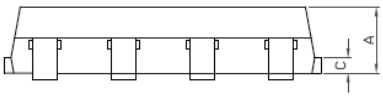
- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
  - Normalized Transient Thermal Impedance Junction-to-Case (25 °C)

  are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

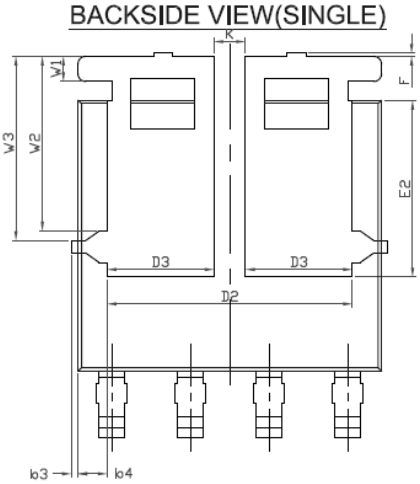
PDFNWB5×6-8L Package Outline Dimensions



TOPSIDE VIEW

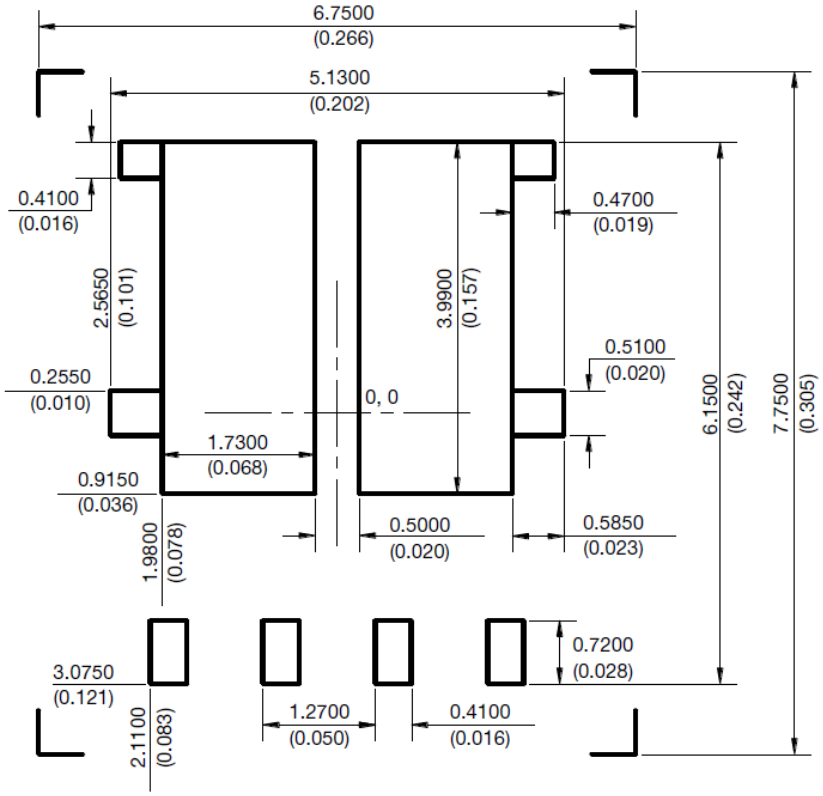


BACKSIDE VIEW(SINGLE)



DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	1.00	1.07	1.14	0.039	0.042	0.045
A1	0.00	-	0.127	0.00	-	0.005
b	0.33	0.41	0.48	0.013	0.016	0.019
b1	0.44	0.51	0.58	0.017	0.020	0.023
b2	4.80	4.90	5.00	0.189	0.193	0.197
b3		0.094			0.004	
b4		0.47			0.019	
c	0.20	0.25	0.30	0.008	0.010	0.012
D	5.00	5.13	5.25	0.197	0.202	0.207
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.86	3.96	4.06	0.152	0.156	0.160
D3	1.63	1.73	1.83	0.064	0.068	0.072
e		1.27 BSC			0.050 BSC	
E	6.05	6.15	6.25	0.238	0.242	0.246
E1	4.27	4.37	4.47	0.168	0.172	0.176
E2	2.75	2.85	2.95	0.108	0.112	0.116
F	-	-	0.15	-	-	0.006
L	0.62	0.72	0.82	0.024	0.028	0.032
L1	0.92	1.07	1.22	0.036	0.042	0.048
K		0.51			0.020	
W		0.23			0.009	
W1		0.41			0.016	
W2		2.82			0.111	
W3		2.96			0.117	
q	0°	-	10°	0°	-	10°

RECOMMENDED MINIMUM PAD FOR PDFNWB5×6-8L



Recommended Minimum Pads
Dimensions in mm (inches)
Keep-out 6.75 (0.266) x 7.75 (0.305)

NOTICE

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