

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	15mΩ@10V	25A
	18mΩ@4.5V	
-40V	32mΩ@-10V	-18A
	45mΩ@-4.5V	

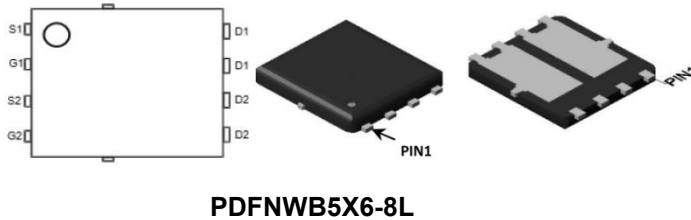
### Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Fast Switching Speed

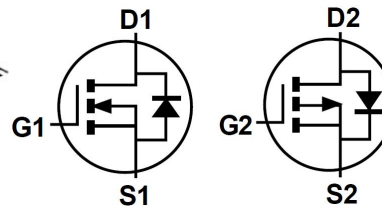
### Application

- Load switching
- Inverters
- Power Management

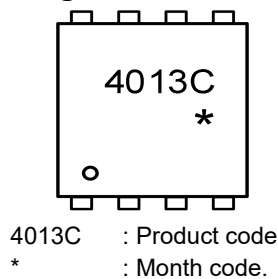
### Package



### Circuit diagram



### Marking



**Absolute maximum ratings (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Value		Unit
		N-Channel	P-Channel	
Drain-Source Voltage	$V_{DS}$	40	-40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	$\pm 20$	V
Continuous Drain Current(TC=25°C)	$I_D$	25	-18	A
Pulsed Drain Current	$I_{DM}$	100	-72	A
Maximum Power Dissipation(TC=25°C)	$P_D$	30		W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	4.16		°C/W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	-55 To 150	°C

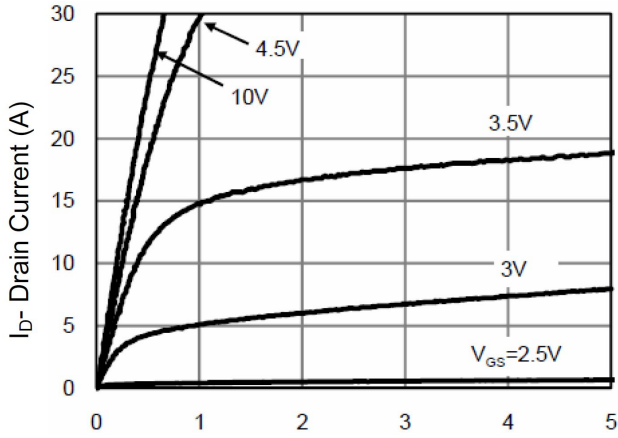
**N-Electrical characteristics (Ta=25 °C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=32V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.5	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	---	15	19	m $\Omega$
		$V_{GS}=4.5V, I_D=8A$	---	18	25	
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=15V, V_{GS}=0V, f=1MHz$	---	1061	---	pF
Output Capacitance	$C_{oss}$		---	110	---	
Reverse Transfer Capacitance	$C_{rss}$		---	95	---	
Total Gate Charge	$Q_g$	$V_{DS}=15V, V_{GS}=10V, I_D=10A$	---	23	---	nC
Gate-Source Charge	$Q_{gs}$		---	3.3	---	
Gate-Drain Charge	$Q_{gd}$		---	5.3	---	
<b>Switching Characteristics</b>						
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=15V, V_{GS}=10V, R_G=3.3\Omega, I_D=6A$	---	5.5	---	ns
Rise Time	$T_r$		---	14	---	
Turn-Off Delay Time	$T_{d(off)}$		---	25	---	
Fall Time	$T_f$		---	12	---	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.2	V

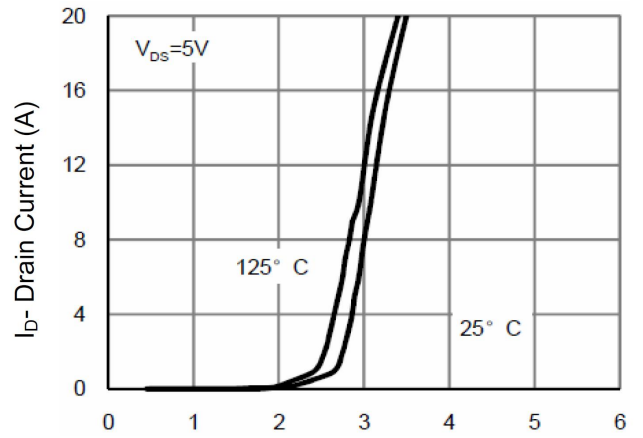
**P-Electrical characteristics (T<sub>A</sub>=25 °C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	VGS=0V , ID=-250uA	-40	---	---	V
Drain-Source Leakage Current	I <sub>DSS</sub>	VDS=-32V , VGS=0V , T <sub>J</sub> =25°C	---	---	-1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	VGS=±20V , VDS=0V	---	---	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	VGS=VDS , ID =-250uA	-1	-1.5	-2.5	V
Drain-source on-resistance	R <sub>DS(ON)</sub>	VGS=-10V , ID=-5A	---	32	45	mΩ
		VGS=-4.5V , ID=-3A	---	45	60	
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	VDS=-15V , VGS=0V , f=1MHz	---	964	---	pF
Output Capacitance	C <sub>oss</sub>		---	110	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	80	---	
Total Gate Charge	Q <sub>g</sub>	VDS=-15V , VGS=-10V , ID=-10A	---	21	---	nC
Gate-Source Charge	Q <sub>gs</sub>		---	3.5	---	
Gate-Drain Charge	Q <sub>gd</sub>		---	5.2	---	
<b>Switching Characteristics</b>						
Turn-On Delay Time	T <sub>d(on)</sub>	VDD=-15V , VGS=-10V , RG=3.3Ω ID=-6A	---	5.1	---	ns
Rise Time	T <sub>r</sub>		---	15	---	
Turn-Off Delay Time	T <sub>d(off)</sub>		---	23	---	
Fall Time	T <sub>f</sub>		---	11	---	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub>	VGS=0V , I <sub>S</sub> =-1A , T <sub>J</sub> =25°C	---	---	-1.2	V

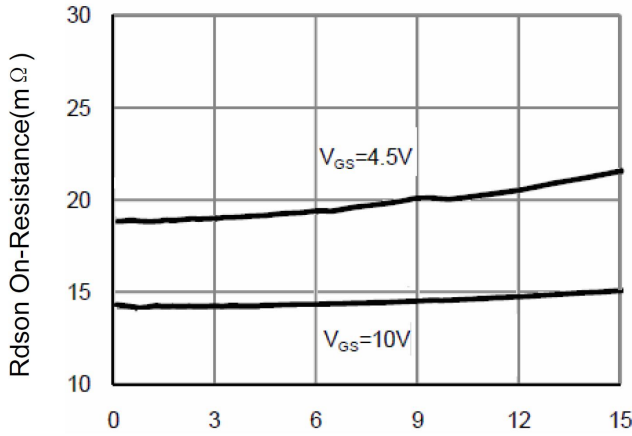
**N-Channel Typical Characteristics**



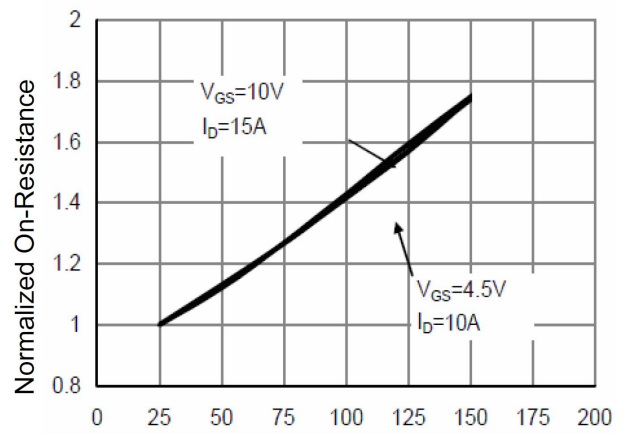
$V_{DS}$  Drain-Source Voltage (V)  
**Output Characteristics**



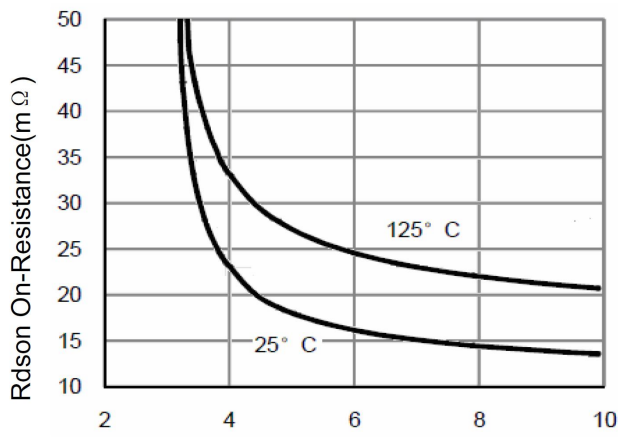
$V_{GS}$  Gate-Source Voltage (V)  
**Transfer Characteristics**



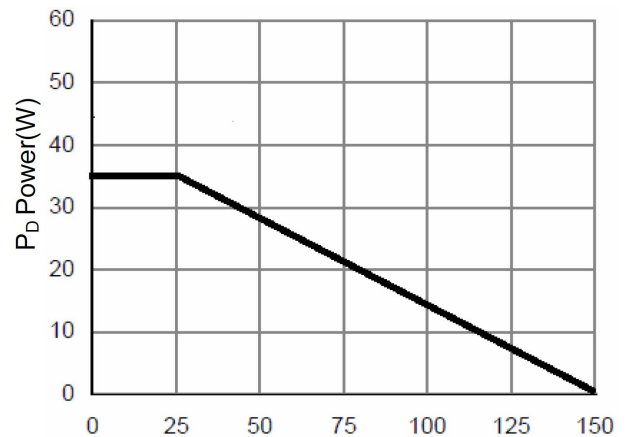
$I_D$ - Drain Current (A)  
**Drain-Source On-Resistance**



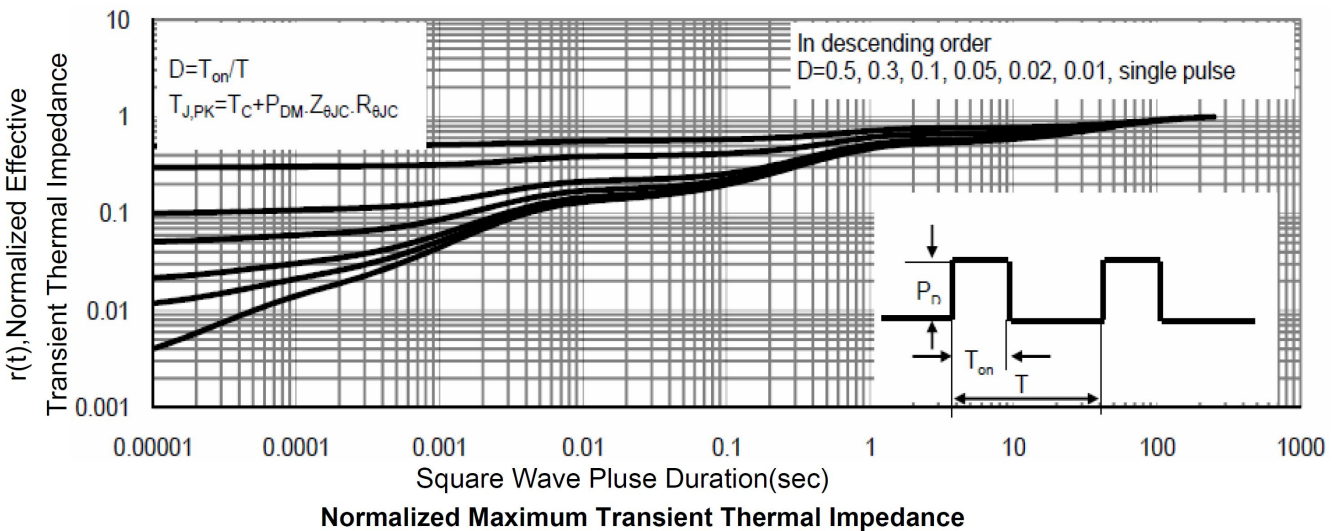
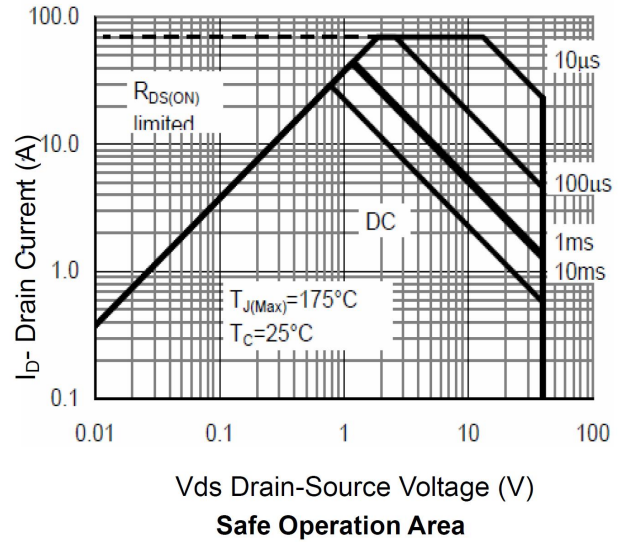
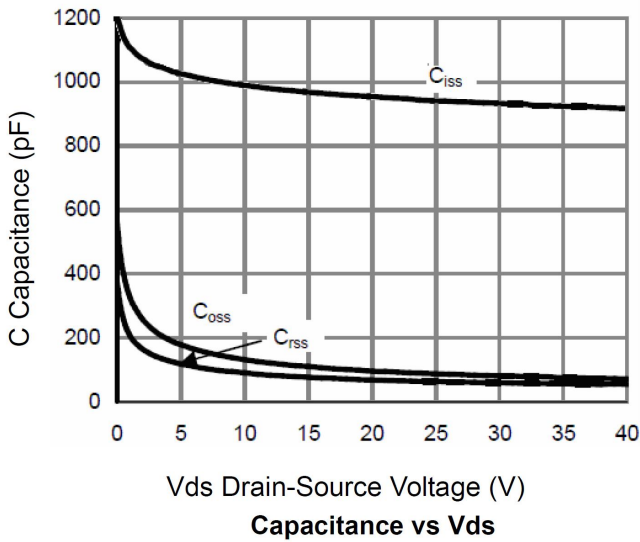
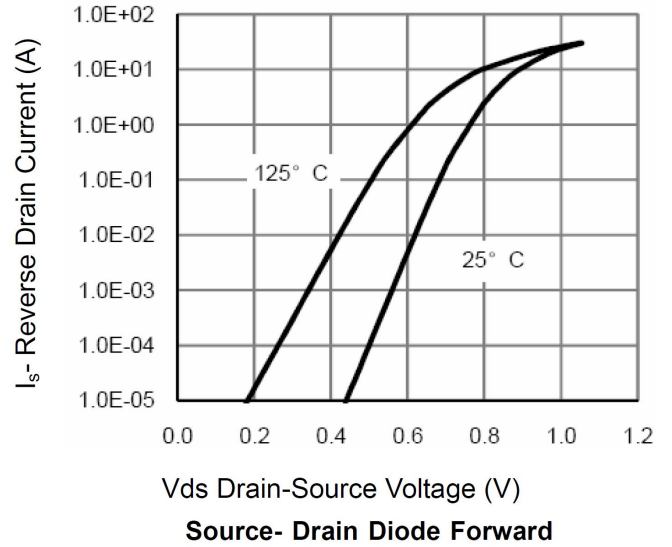
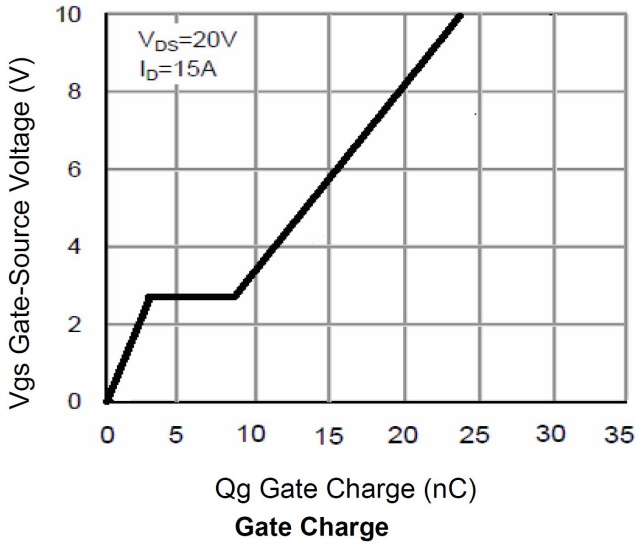
$T_J$ -Junction Temperature( $^{\circ}C$ )  
**Drain-Source On-Resistance**



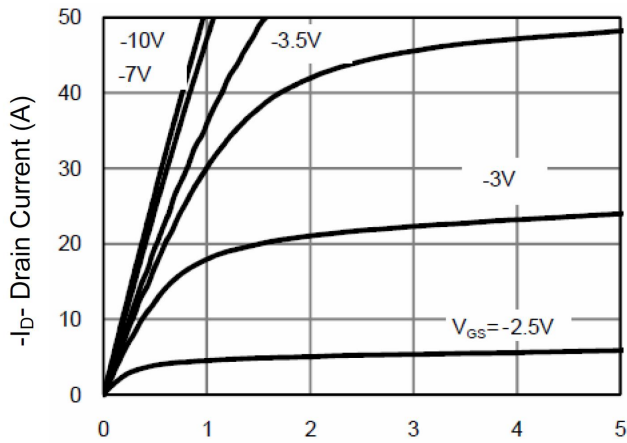
$V_{GS}$  Gate-Source Voltage (V)  
 **$R_{DS(on)}$  vs  $V_{GS}$**



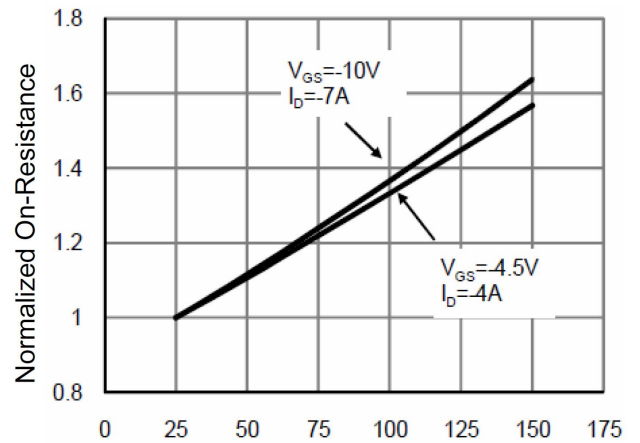
$T_J$ -Junction Temperature( $^{\circ}C$ )  
**Power Dissipation**



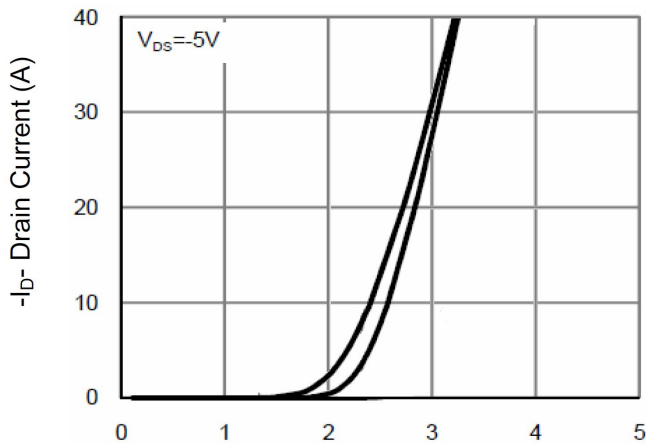
**P-Channel Typical Characteristics**



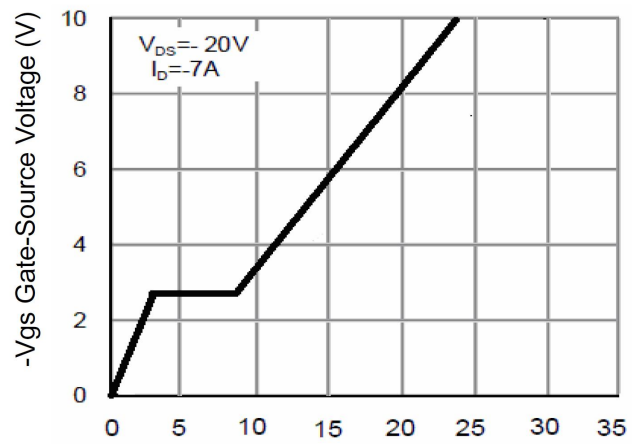
-Vds Drain-Source Voltage (V)  
**Output Characteristics**



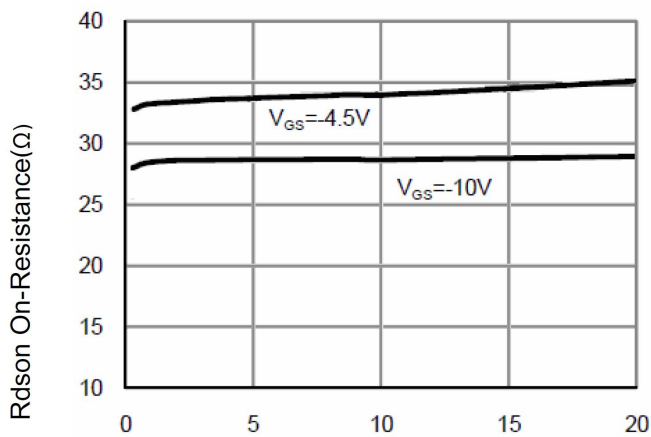
$T_J$ -Junction Temperature(°C)  
 $R_{DSON}$ -Junction Temperature



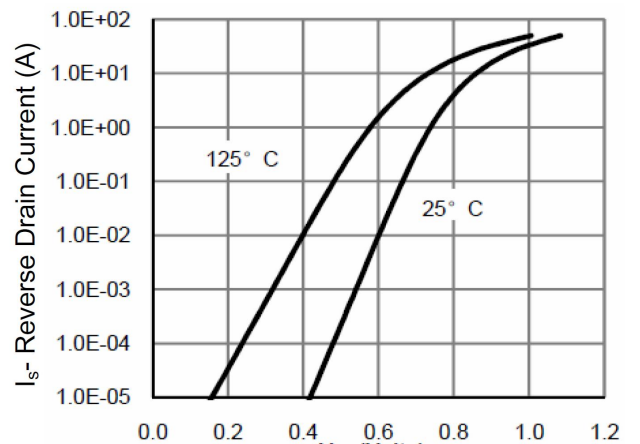
-Vgs Gate-Source Voltage (V)  
**Transfer Characteristics**



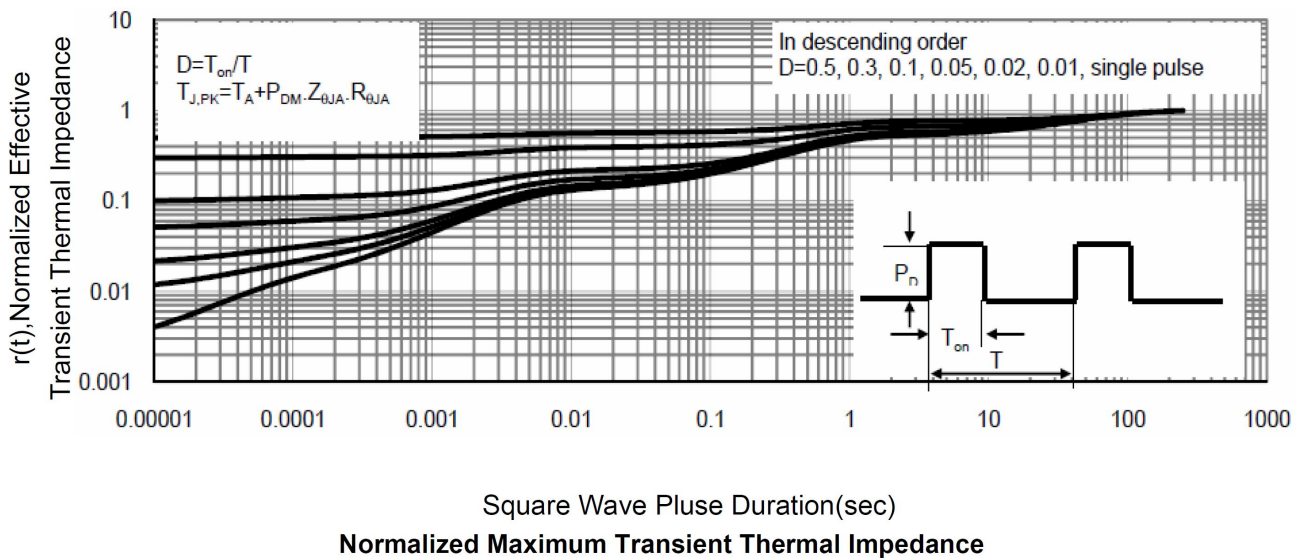
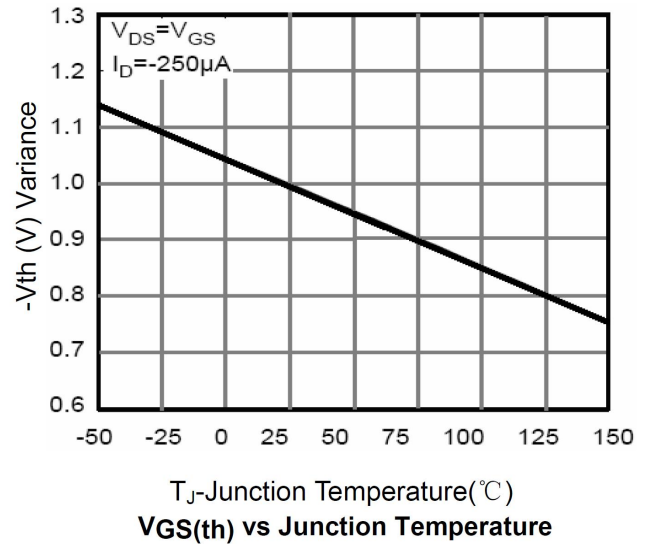
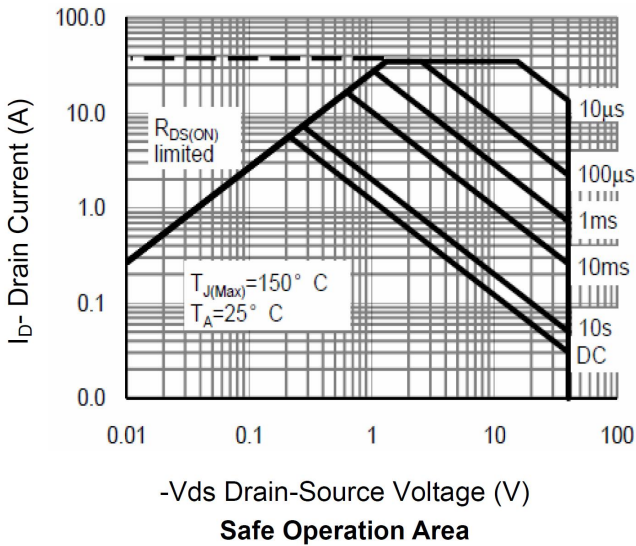
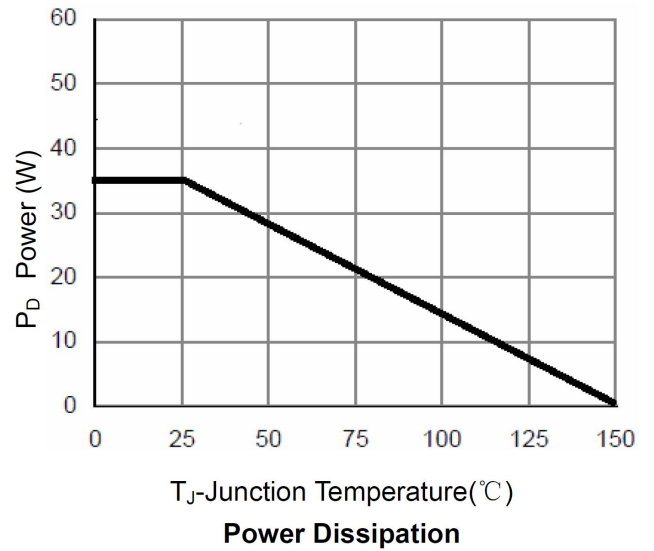
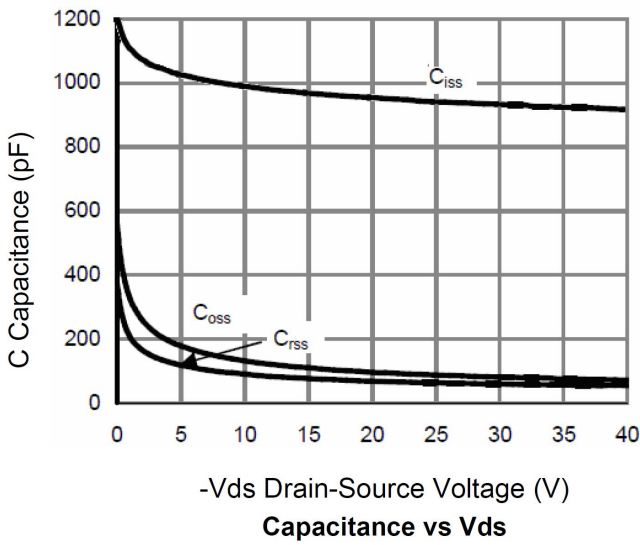
Qg Gate Charge (nC)  
**Gate Charge**



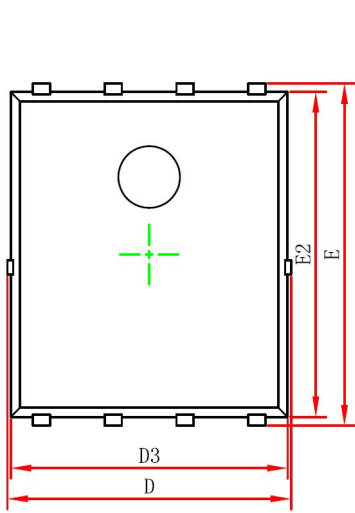
-ID- Drain Current (A)  
**Rdson- Drain Current**



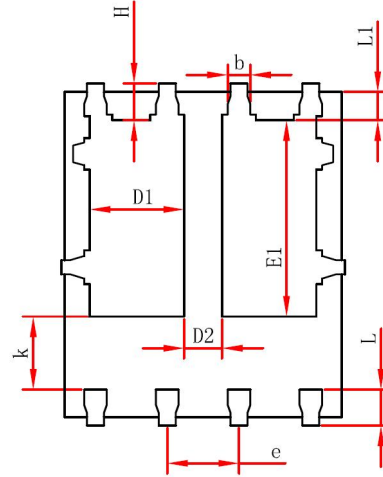
-Vsd Source-Drain Voltage (V)  
**Source- Drain Diode Forward**



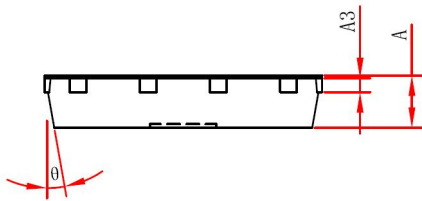
**PDFNWB5x6-8L-A Package Information**



Top View  
[顶视图]



Bottom View  
[背视图]



Side View  
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254 REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	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	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°



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