

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	15mΩ@10V	25A
	18mΩ@4.5V	
-40V	23mΩ@-10V	-23A
	32mΩ@-4.5V	

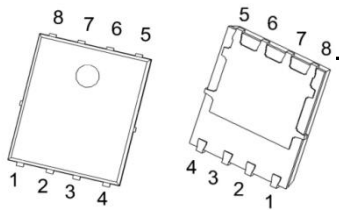
Feature

- High density cell design for ultra low Rds(on)
- Fully characterized avalanche voltage and current
- Fast Switching Speed

Application

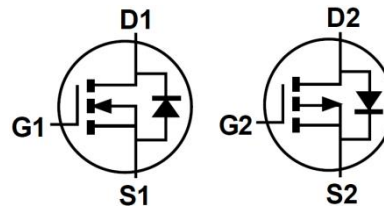
- Load switching
- Inverters
- Power Management

Package

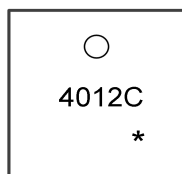


PDFNWB5×6-8L

Circuit diagram



Marking



4012C : Product code
* : Month code.

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}	± 20	± 20	V
Continuous Drain Current(TC=25°C)	I_D	25	-23	A
Pulsed Drain Current	I_{DM}	100	-92	A
Maximum Power Dissipation(TC=25°C)	P_D	32		W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	3.9		°C/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	-55 To 150	°C

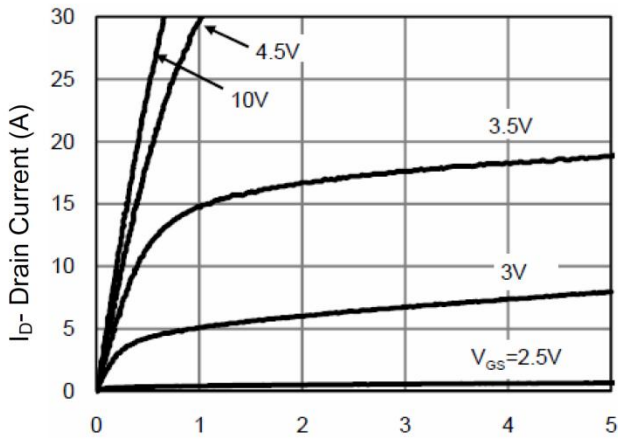
N-Electrical characteristics (Ta=25 °C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
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	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 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 Ω
		$V_{GS}=4.5V, I_D=8A$	---	18	25	
Dynamic Characteristics						
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	---	
Switching Characteristics						
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	---	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.2	V

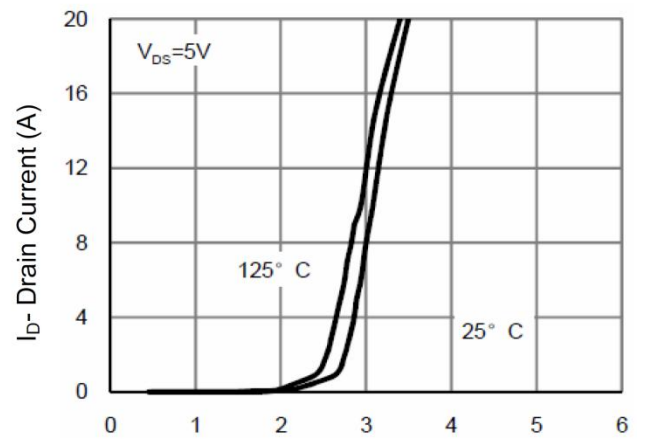
P-Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , I _D =-250uA	-40	---	---	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-32V , V _{GS} =0V , T _J =25°C	---	---	-1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-1	-1.5	-2.5	V
Drain-source on-resistance	R _{DS(ON)}	V _{GS} =-10V , I _D =-5A	---	23	29	mΩ
		V _{GS} =-4.5V , I _D =-3A	---	32	43	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-15V , V _{GS} =0V , f=1MHz	---	1415	---	pF
Output Capacitance	C _{oss}		---	134	---	
Reverse Transfer Capacitance	C _{rss}		---	102	---	
Total Gate Charge	Q _g	V _{DS} =-15V , V _{GS} =-10V , I _D =-10A	---	11.5	---	nC
Gate-Source Charge	Q _{gs}		---	3.5	---	
Gate-Drain Charge	Q _{gd}		---	3.3	---	
Switching Characteristics						
Turn-On Delay Time	T _{d(on)}	V _{DD} =-15V , V _{GS} =-10V , R _G =3.3Ω I _D =-6A	---	22	---	ns
Rise Time	T _r		---	15.7	---	
Turn-Off Delay Time	T _{d(off)}		---	59	---	
Fall Time	T _f		---	5.5	---	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =-1A , T _J =25°C	---	---	-1.2	V

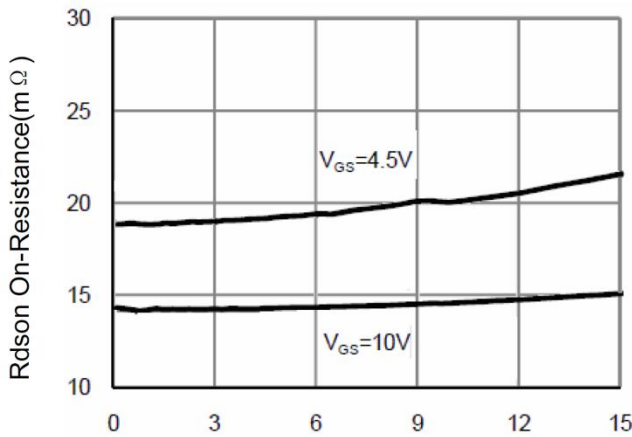
N-Channel Typical Characteristics



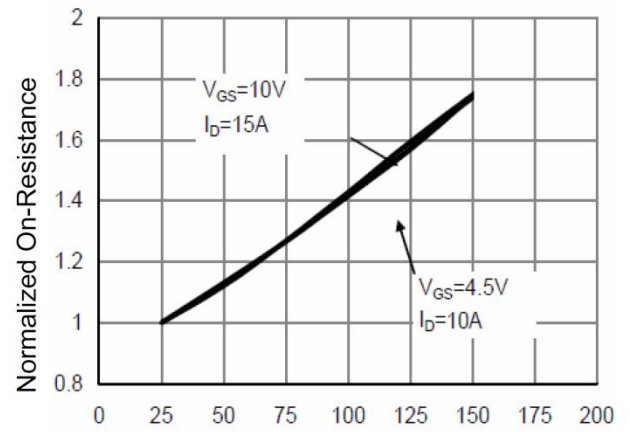
V_{DS} Drain-Source Voltage (V)
Output Characteristics



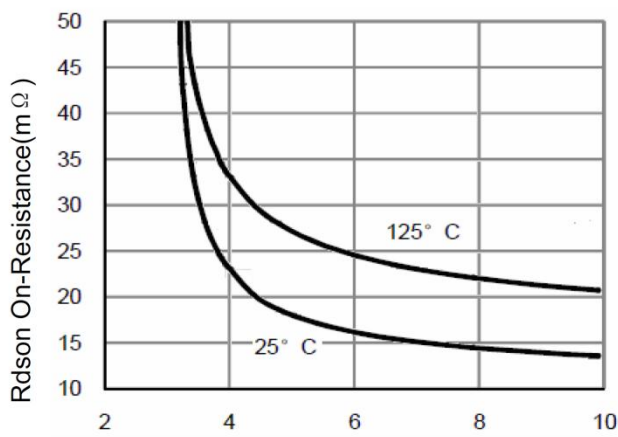
V_{GS} Gate-Source Voltage (V)
Transfer Characteristics



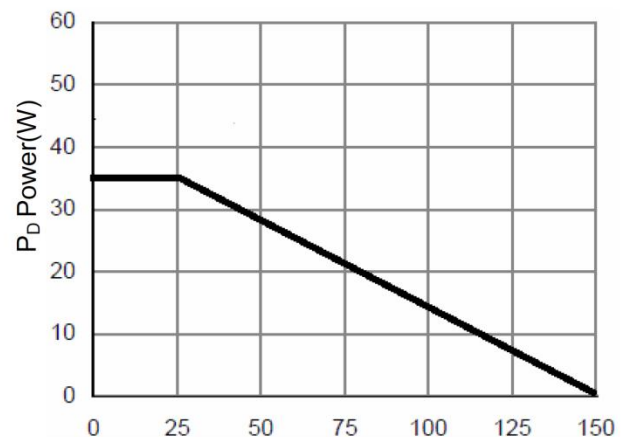
I_D - Drain Current (A)
Drain-Source On-Resistance



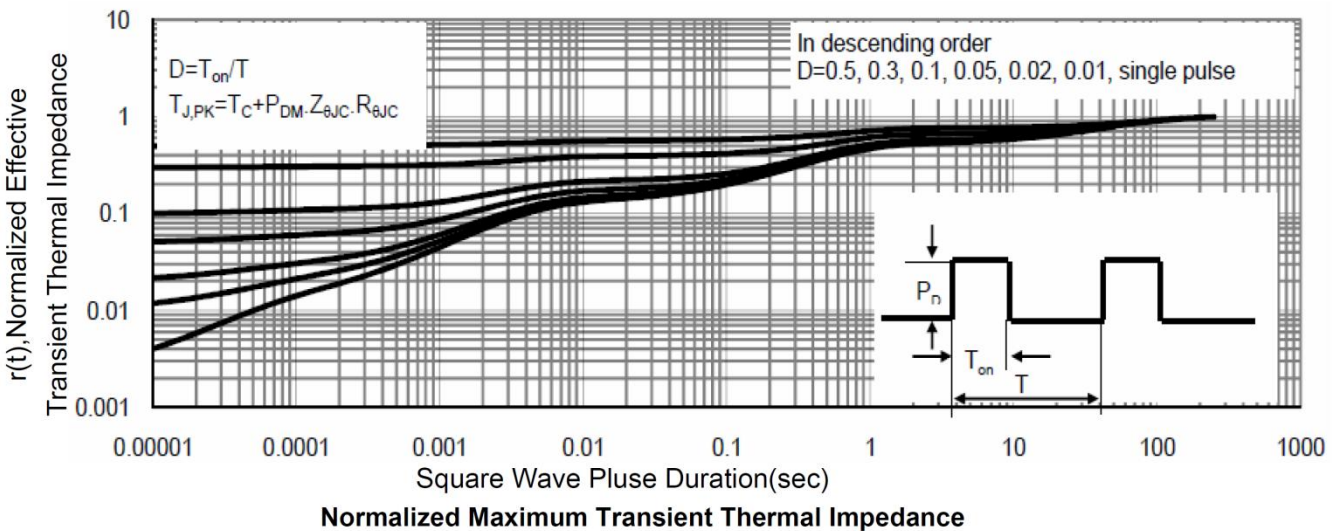
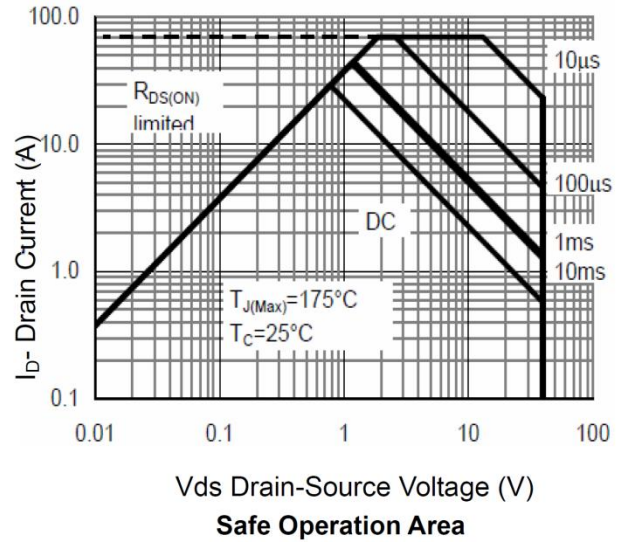
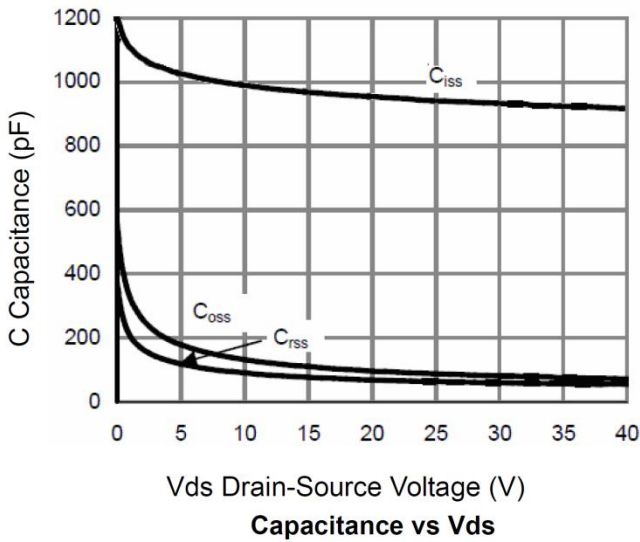
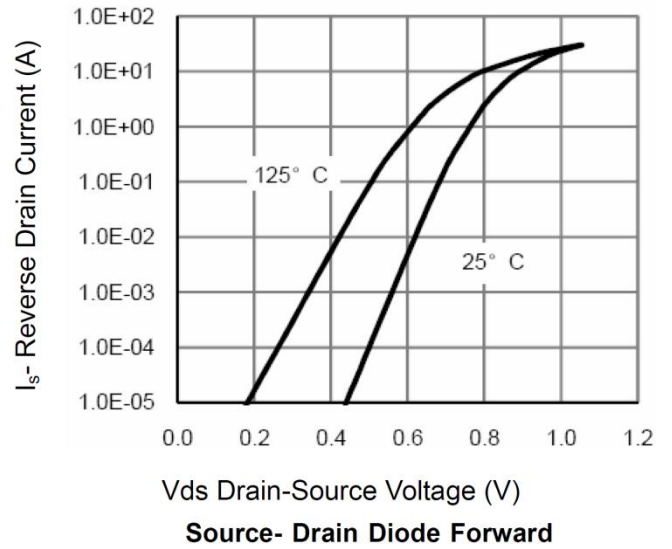
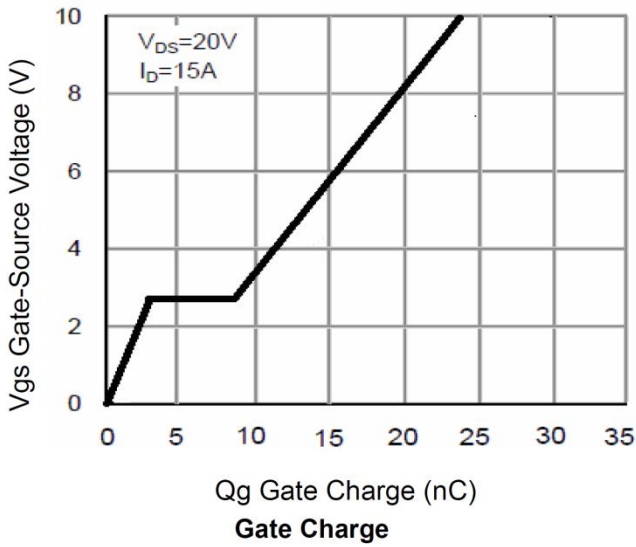
T_J -Junction Temperature($^{\circ}C$)
Drain-Source On-Resistance



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



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



P-Channel Typical Characteristics

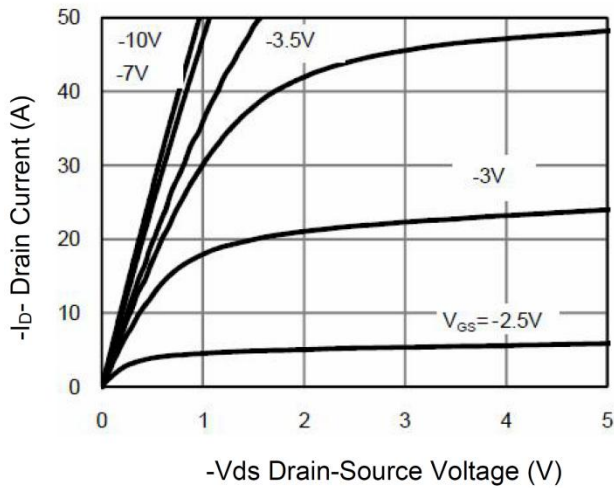


Figure 1 Output Characteristics

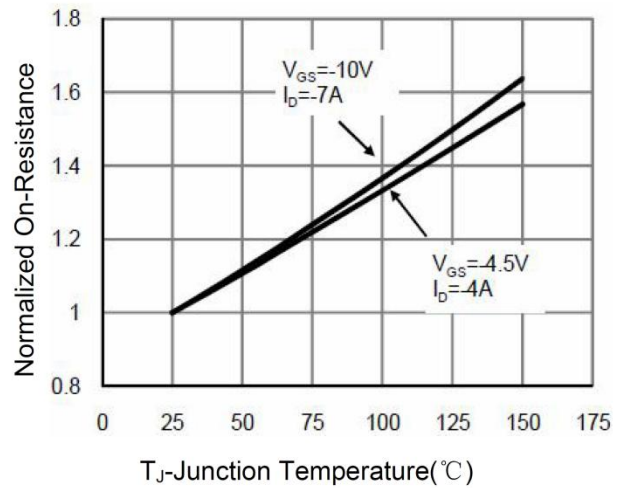


Figure 4 Rdson-Junction Temperature

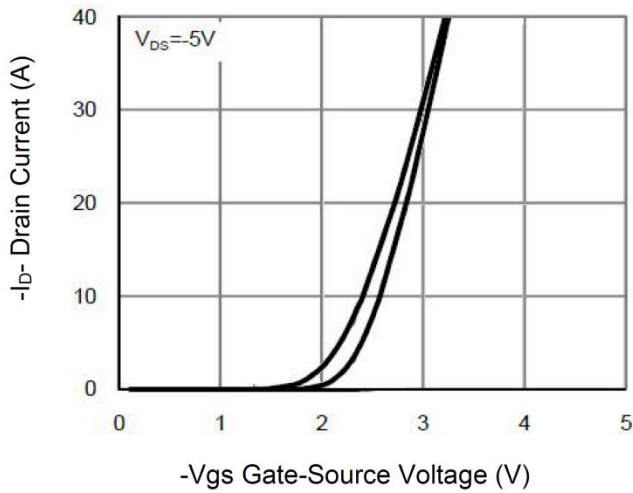


Figure 2 Transfer Characteristics

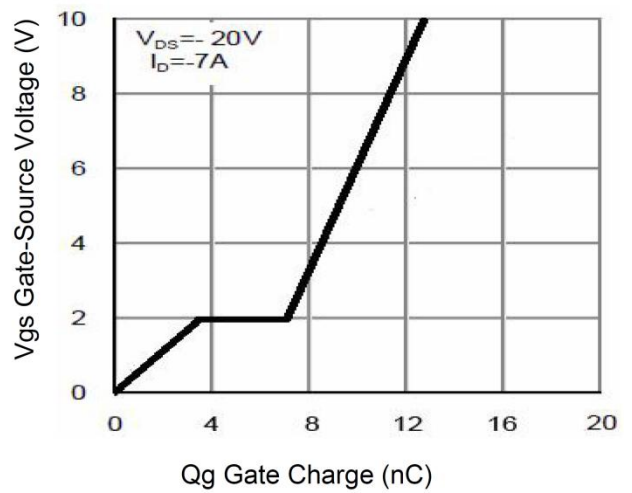


Figure 5 Gate Charge

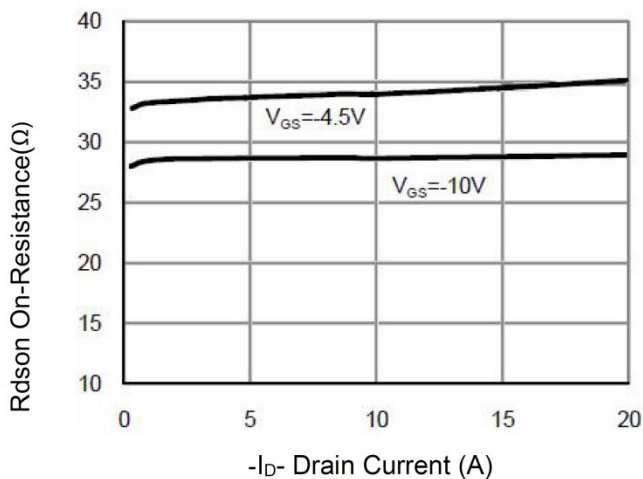


Figure 3 Rdson- Drain Current

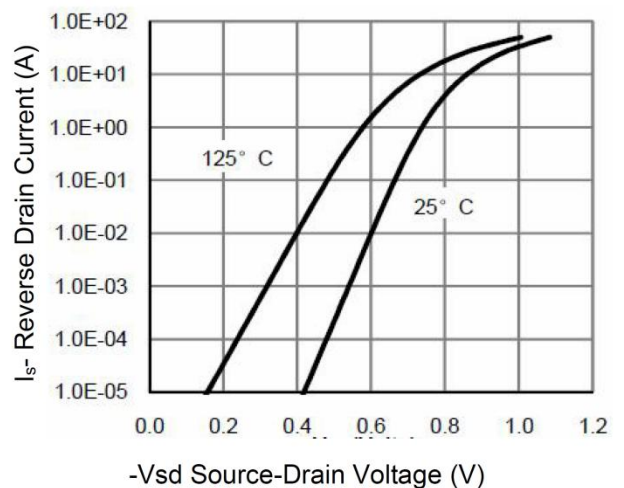
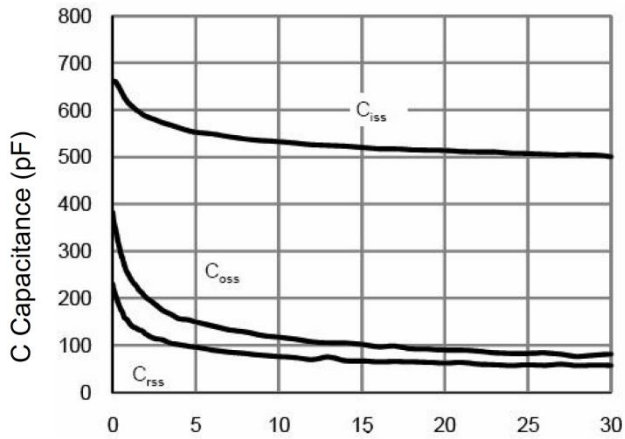
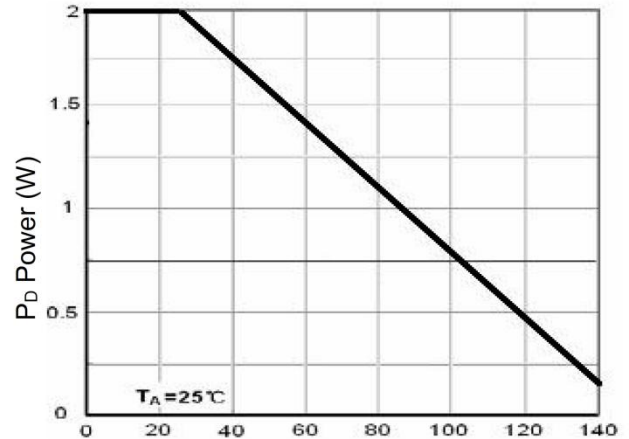


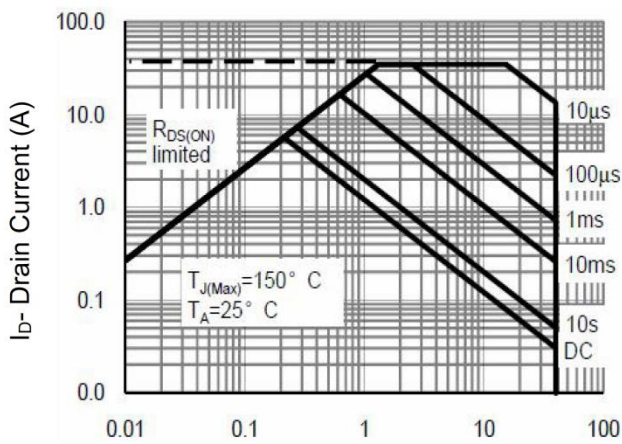
Figure 6 Source- Drain Diode Forward



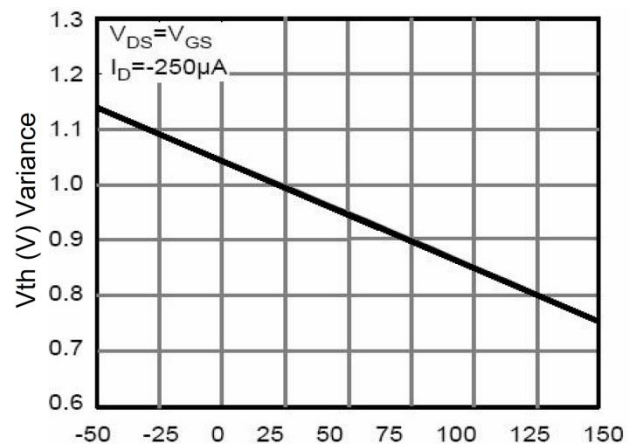
-Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



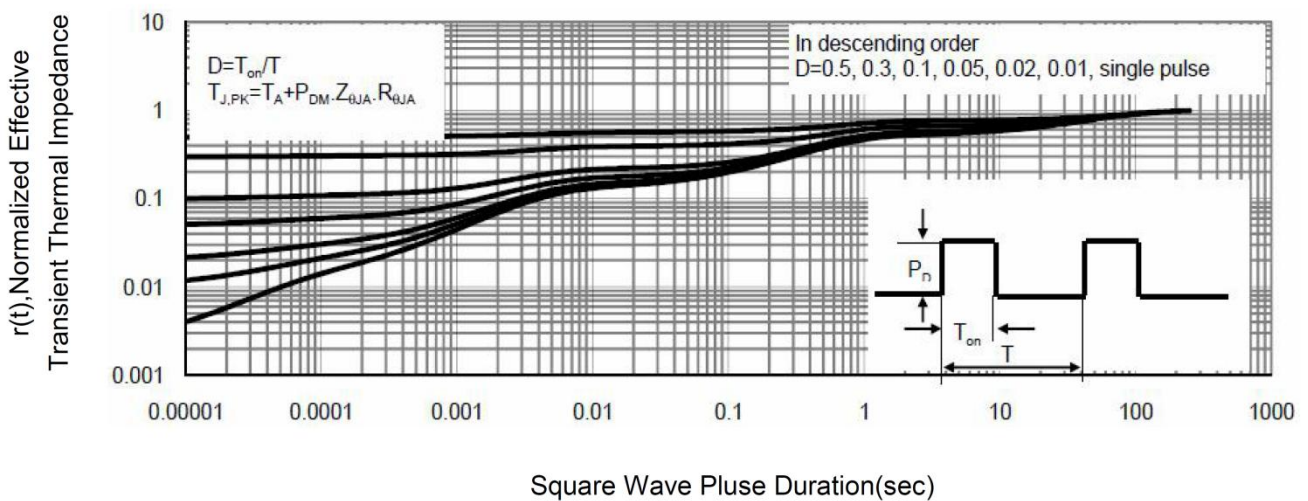
T_J-Junction Temperature(°C)
Figure 9 Power Dissipation



-Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area

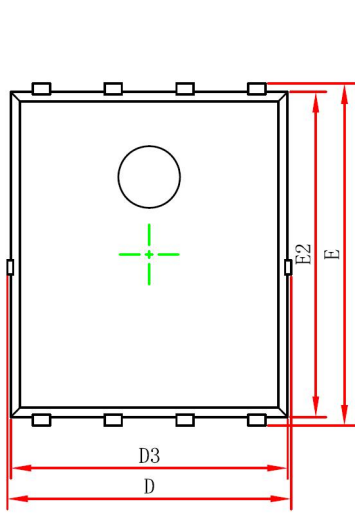


T_J-Junction Temperature(°C)
Figure 10 V_{GS(th)} vs Junction Temperature

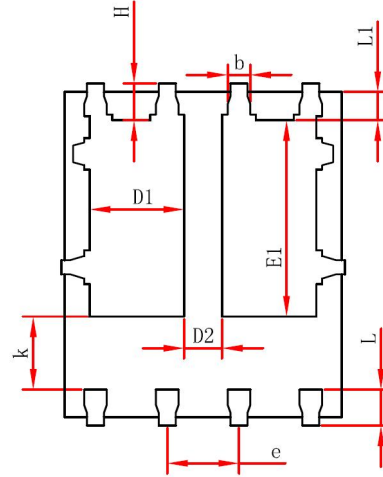


Square Wave Pulse Duration(sec)
Figure 11 Normalized Maximum Transient Thermal Impedance

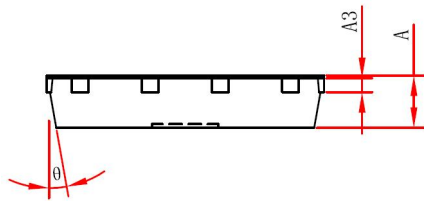
PDFNWB5x6-8L-A Package Information



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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