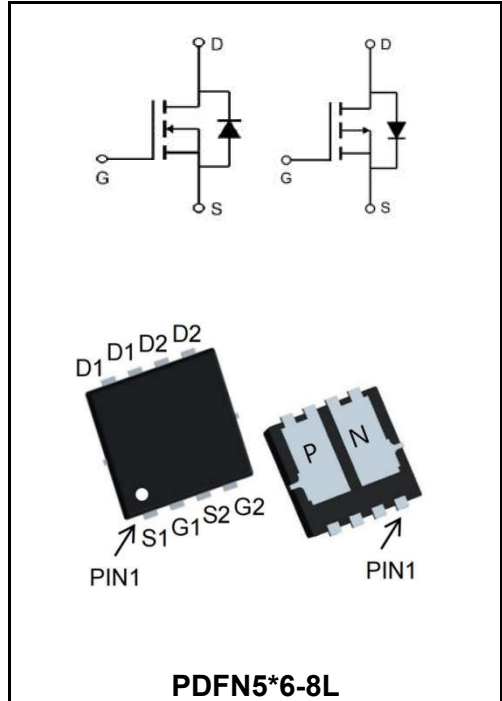


**100V N+P-CHANNEL ENHANCEMENT MODE MOSFET**

**MAIN CHARACTERISTICS**

$I_D$	8A
$V_{DSS}$	100V
$R_{DS(on)-typ}(@V_{GS}=10V)$	< 75mΩ (Type:55 mΩ)
$I_D$	-6.5A
$V_{DSS}$	-100V
$R_{DS(on)-typ}(@V_{GS}=-10V)$	< 210mΩ (Type:170 mΩ)



**Application**

- ◆ Battery protection
- ◆ Load switch
- ◆ Uninterruptible power supply

**Product Specification Classification**

Part Number	Package	Marking	Pack
YFW8G10NF	PDFN5*6-8L	YFW 8G10NF XXXXX	5000PCS/Tape

**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Symbols	Value		Units
		N-Ch	P-Ch	
Drain-Source Voltage	$V_{DS}$	100	-100	V
Gate - Source Voltage	$V_{GS}$	±20	±20	V
Continuous drain current <sup>1)</sup> , T <sub>c</sub> =25 °C	$I_D$	8	-6.5	A
Pulsed drain current <sup>2)</sup> , T <sub>c</sub> =25 °C	$I_{D, pulse}$	45	-40	A
Power dissipation <sup>3)</sup> , T <sub>c</sub> =25 °C	$P_D$	17	54	W
Single Pulse Avalanche Energy <sup>4)</sup>	$E_{AS}$	4.2	38	mJ
Operation and storage temperature	T <sub>STG</sub> , T <sub>J</sub>	-55 to +150		°C
Thermal Resistance Junction-Case	$R_{\theta JC}$	7.4	2.3	°C/W
Thermal Resistance Junction-Ambient <sup>5)</sup>	$R_{\theta JA}$	62	62	°C/W

**N-Channel Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	<b>BV<sub>DSS</sub></b>	100	-	-	<b>V</b>
Gate -Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	<b>V<sub>GS(th)</sub></b>	1.0	1.7	3.0	<b>V</b>
Drain-source on-state resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =5A	<b>R<sub>DS(ON)</sub></b>	-	55	75	<b>mΩ</b>
	V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A		-	112	300	
Gate-Source Leakage Current	V <sub>GS</sub> =±20V	<b>I<sub>GSS</sub></b>	-	-	±100	<b>nA</b>
Drain-Source Leakage Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	<b>I<sub>DSS</sub></b>	-	-	200	<b>nA</b>
Input Capacitance	V <sub>DS</sub> =50V V <sub>GS</sub> =0V f=1MHz	<b>C<sub>iss</sub></b>	-	429.4	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	58.3	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	2.9	-	
Turn-on delay time	V <sub>GS</sub> =10V V <sub>DS</sub> =50V R <sub>G</sub> = 2Ω I <sub>D</sub> = 5A	<b>t<sub>d(on)</sub></b>	-	15.6	-	<b>ns</b>
Rise Time		<b>T<sub>r</sub></b>	-	4.2	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	26.8	-	
Fall Time		<b>t<sub>f</sub></b>	-	3.6	-	
Total Gate Charge	I <sub>D</sub> =5A V <sub>DS</sub> =50V V <sub>GS</sub> =10V	<b>Q<sub>g</sub></b>	-	7.6	-	<b>nC</b>
Gate-Source Charge		<b>Q<sub>gs</sub></b>	-	1.4	-	
Gate-Drain Charge		<b>Q<sub>gd</sub></b>	-	2.4	-	
Gate plateau voltage		<b>V<sub>plateau</sub></b>	-	4.5	-	
Diode forward current	V <sub>GS</sub> <V <sub>th</sub>	<b>I<sub>S</sub></b>	-	-	15	<b>A</b>
Pulsed Source Current		<b>I<sub>SP</sub></b>	-	-	45	<b>A</b>
Diode Forward Voltage	I <sub>S</sub> =7A, V <sub>GS</sub> =0V,	<b>V<sub>SD</sub></b>	-	-	1.3	<b>V</b>
Reverse recovery time	I <sub>S</sub> =5 A, di/dt=100 A/μs	<b>t<sub>rr</sub></b>	-	36.1	-	<b>ns</b>
Reverse recovery charge		<b>Q<sub>rr</sub></b>	-	50.4	-	<b>nC</b>
Peak reverse recovery current		<b>I<sub>rrm</sub></b>	-	2.6	-	<b>A</b>

**Note**

- 1、 Calculated continuous current based on maximum allowable junction temperature.
- 2、 Repetitive rating; pulse width limited by max. junction temperature.
- 3、 Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4、 V<sub>DD</sub>=50 V, R<sub>G</sub>=50Ω, L=0.3 mH, starting T<sub>J</sub>=25 °C.
- 5、 The value of RθJA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25 °C.

**P-Channel Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	<b>V(BR)DSS</b>	-100	-	-	<b>V</b>
Static Drain-Source On-Resistance	V <sub>GS</sub> =-10V, I <sub>D</sub> =-5A	<b>R<sub>DS(ON)</sub></b>	-	170	210	<b>mΩ</b>
	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A		-	190	230	
Gate -Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	<b>V<sub>GS(th)</sub></b>	-1	-	-3	<b>V</b>
Drain-to-Source Leakage Current	V <sub>DS</sub> =-100V, V <sub>GS</sub> =0V	<b>I<sub>DSS</sub></b>	-	-	-1	<b>uA</b>
Gate-to-Source forward leakage	V <sub>GS</sub> =30V	<b>I<sub>GSS</sub></b>	-	-	100	<b>nA</b>
	V <sub>GS</sub> =-30V		-	-	-100	
Total Gate Charge	I <sub>D</sub> =-5A V <sub>DS</sub> =-80V V <sub>GS</sub> =-10V	<b>Q<sub>g</sub></b>	-	20	-	<b>nC</b>
Gate-to-Source Charge		<b>Q<sub>gs</sub></b>	-	3.5	-	
Gate-to-Drain("Miller") charge		<b>Q<sub>gd</sub></b>	-	4.6	-	
Turn-on delay time	V <sub>GS</sub> = -10V V <sub>DS</sub> = -50V R <sub>GEN</sub> =25Ω I <sub>D</sub> =-5A	<b>t<sub>d(on)</sub></b>	-	18	-	<b>ns</b>
Rise Time		<b>T<sub>r</sub></b>	-	8	-	
Turn-Off Delay Time		<b>t<sub>d(OFF)</sub></b>	-	100	-	
Fall Time		<b>t<sub>f</sub></b>	-	30	-	
Input Capacitance	V <sub>DS</sub> =-25V V <sub>GS</sub> =0V f=1MHz	<b>C<sub>iss</sub></b>	-	1419	-	<b>pF</b>
Output Capacitance		<b>C<sub>oss</sub></b>	-	89	-	
Reverse Transfer Capacitance		<b>C<sub>rss</sub></b>	-	45	-	
Continuous Source Current (Body Diode)	MOSFET symbol showing the integral reverse p-n junction diode.	<b>I<sub>S</sub></b>	-	-	-10	<b>A</b>
Pulsed Source Current (Body Diode)		<b>I<sub>SM</sub></b>	-	-	-20	<b>A</b>
Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A	<b>V<sub>SD</sub></b>	-	-	-1.2	<b>V</b>
Reverse recovery time	T <sub>J</sub> = 25°C, I <sub>F</sub> =-5A, di/dt = 100A/μs	<b>t<sub>rr</sub></b>	-	27	-	<b>ns</b>
Reverse recovery charge		<b>Q<sub>rr</sub></b>	-	24	-	<b>nC</b>

**Notes:**

- 1、 Calculated continuous current based on maximum allowable junction temperature.
- 2、 Repetitive rating; pulse width limited by max. junction temperature.
- 3、 The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- 4、 The value of R<sub>θJA</sub> is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

**N-Electrical Characteristics Diagrams**

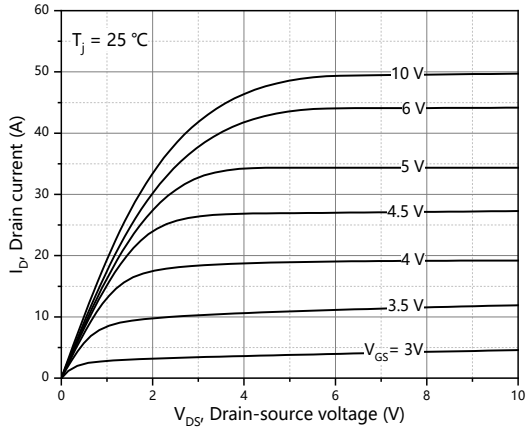


Figure 1, Typ. output characteristics

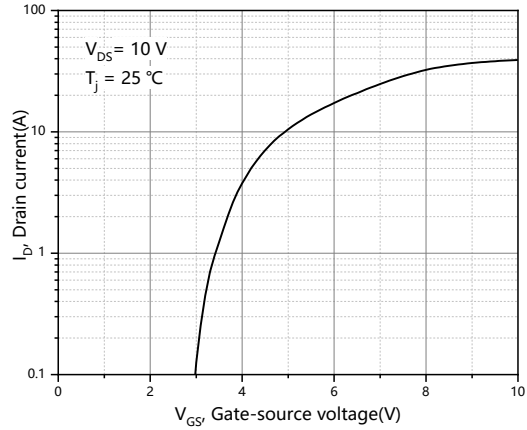


Figure 2, Typ. transfer characteristics

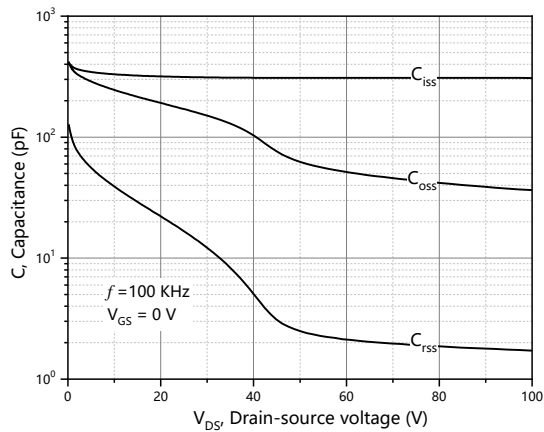


Figure 3, Typ. capacitances

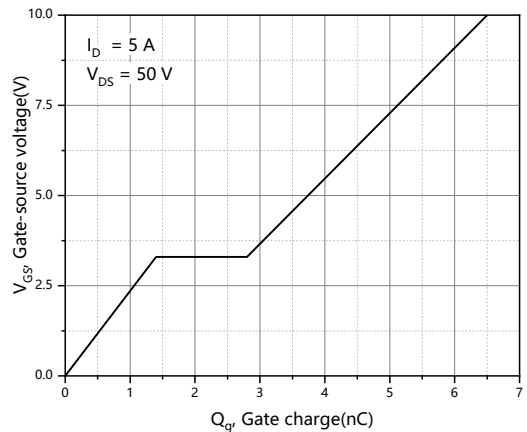


Figure 4, Typ. gate charge

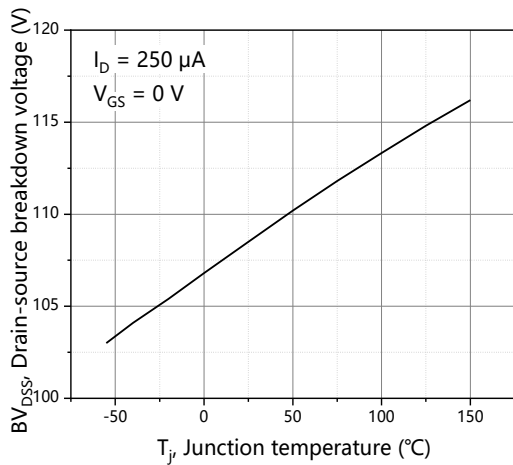


Figure 5, Drain-source breakdown voltage

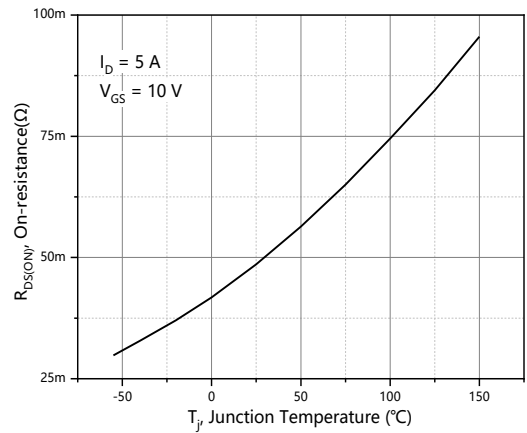


Figure 6, Drain-source on-state resistance

**Ratings and Characteristic Curves**

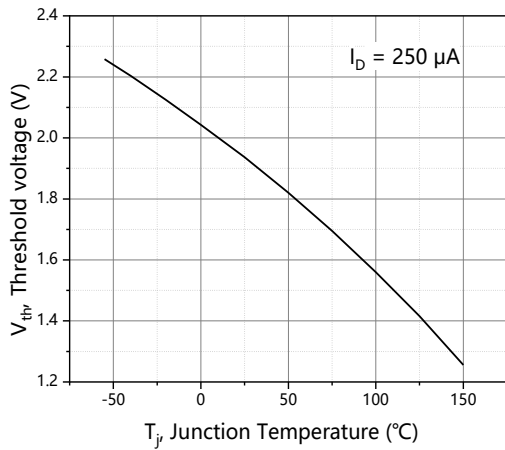


Figure 7, Threshold voltage

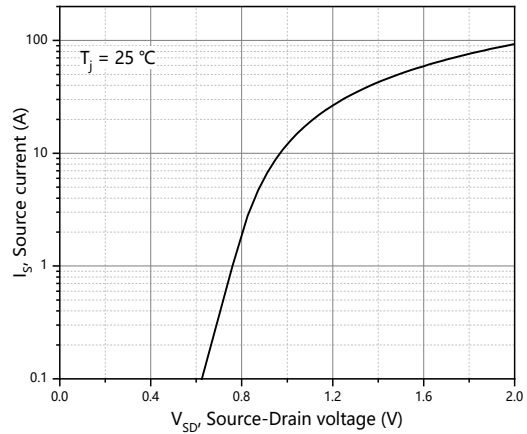


Figure 8, Forward characteristic of body diode

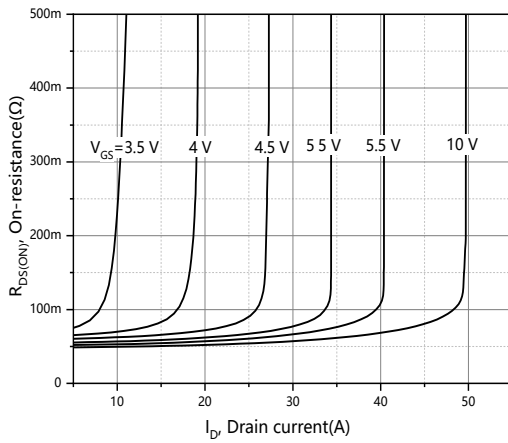


Figure 9, Drain-source on-state resistance

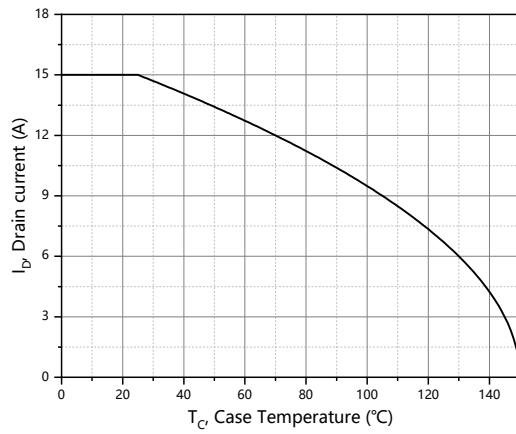


Figure 10, Drain current

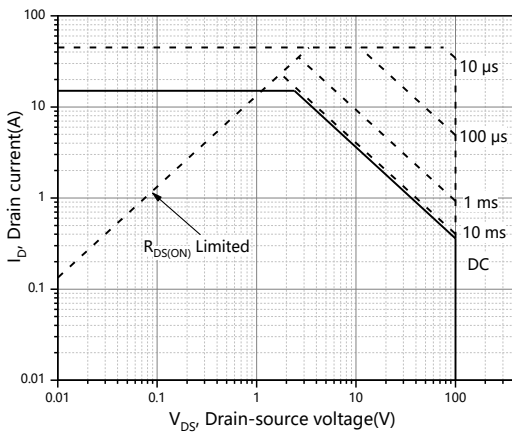


Figure 11, Safe operation area  $T_C=25\text{ }^\circ\text{C}$

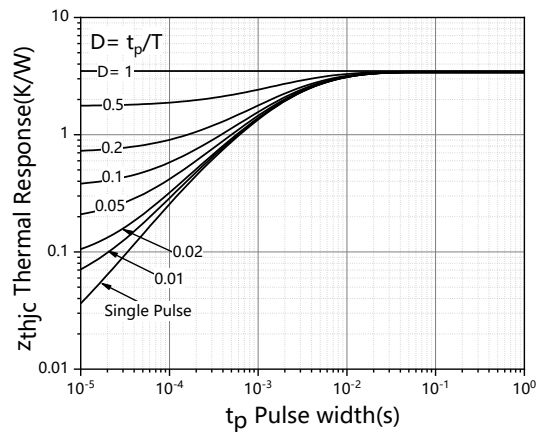
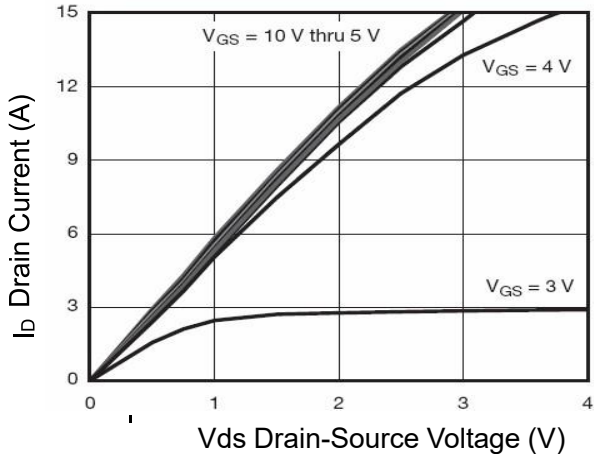
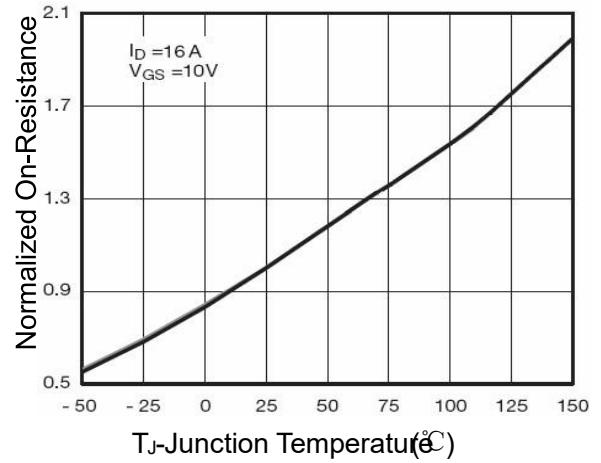


Figure 12, Max. transient thermal impedance

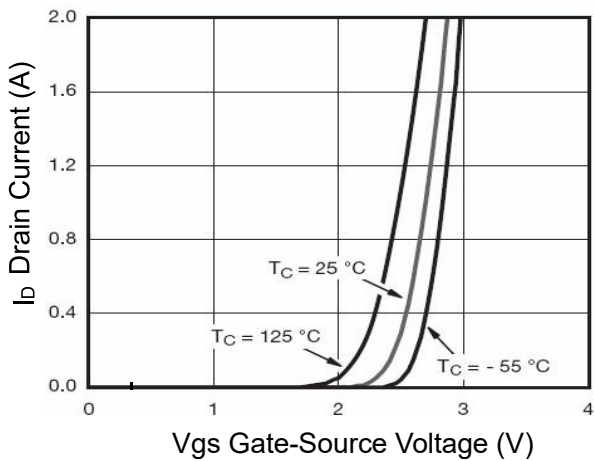
**P-Electrical Characteristics Diagrams**



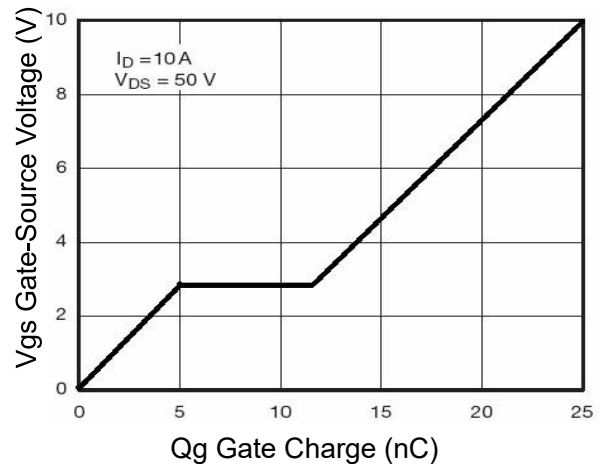
**Figure 1 Output Characteristics**



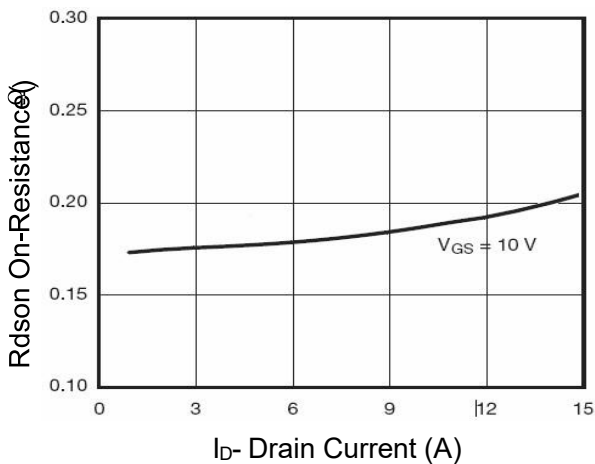
**Figure 4 Rdson-Junction Temperature**



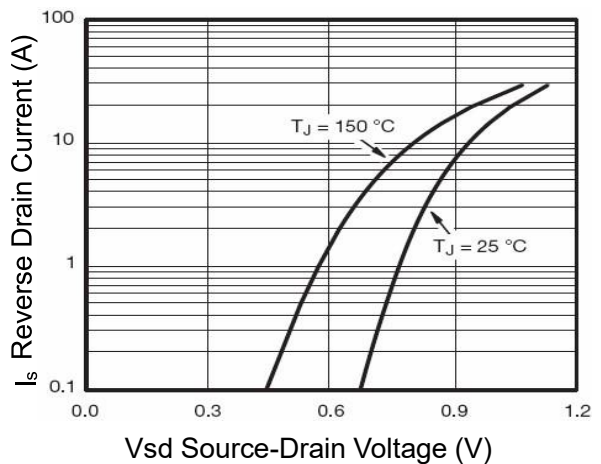
**Figure 2 Transfer Characteristics**



**Figure 5 Gate Charge**

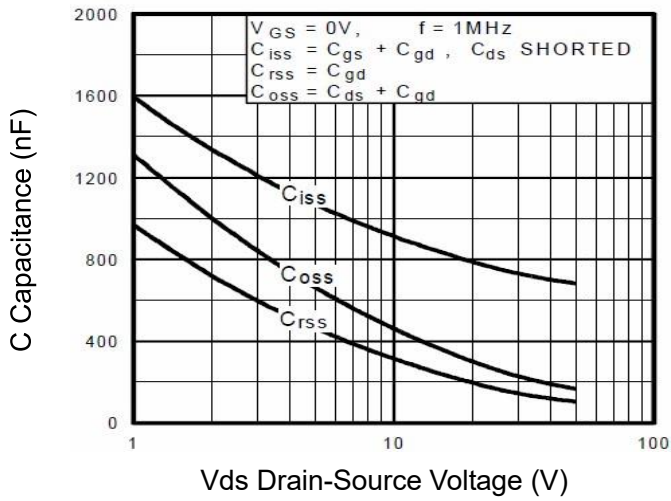


**Figure 3 Rdson Drain Current**

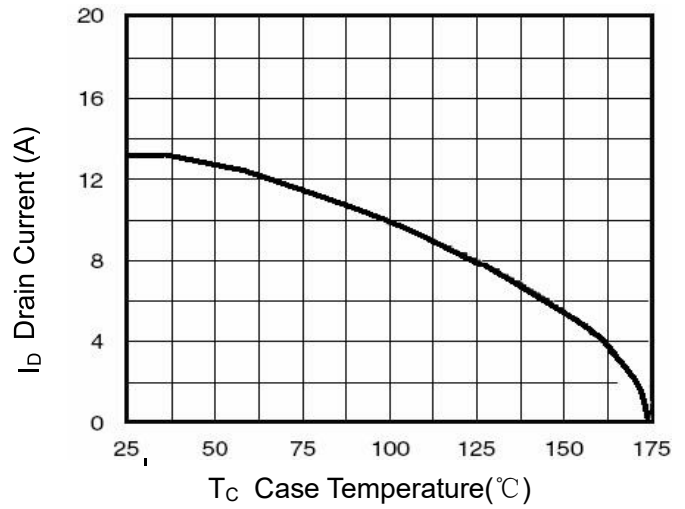


**Figure 6 Source- Drain Diode Forward**

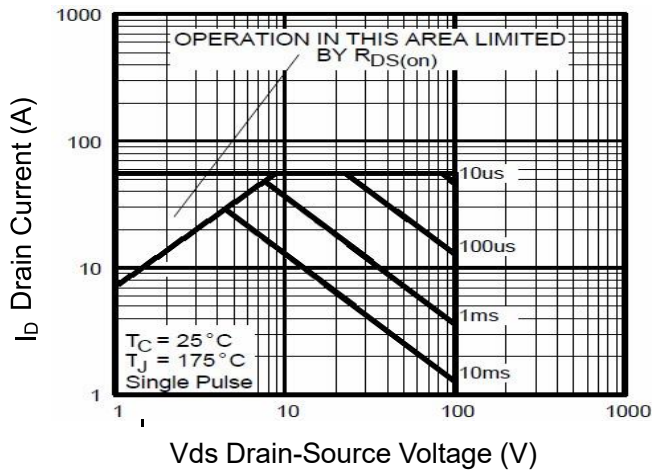
**Ratings and Characteristic Curves**



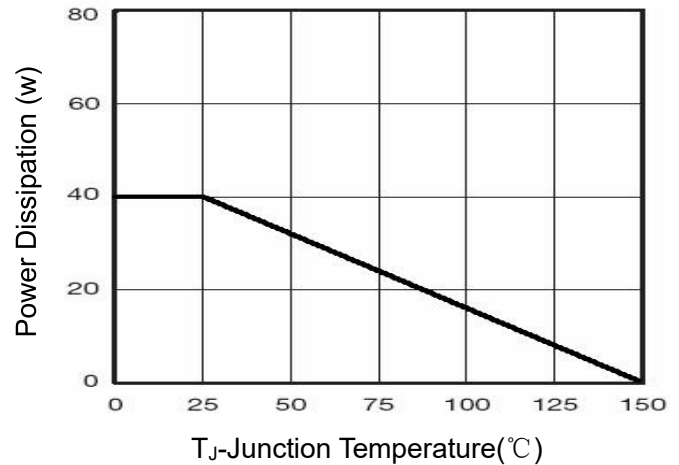
**Figure 7 Capacitance vs Vds**



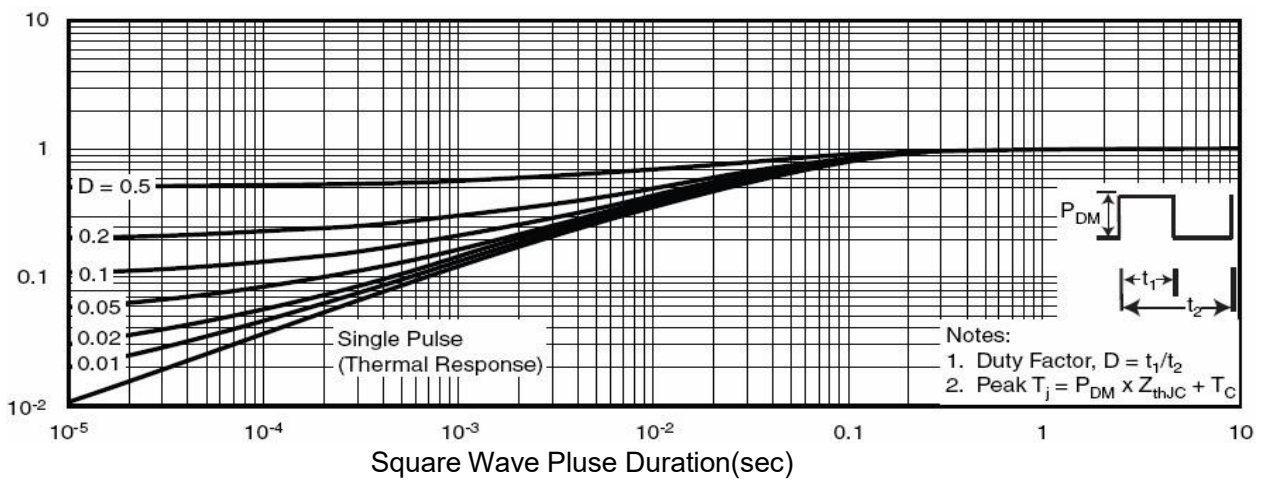
**Figure 9 Drain Current vs Case Temperature**



**Figure 8 Safe Operation Area**

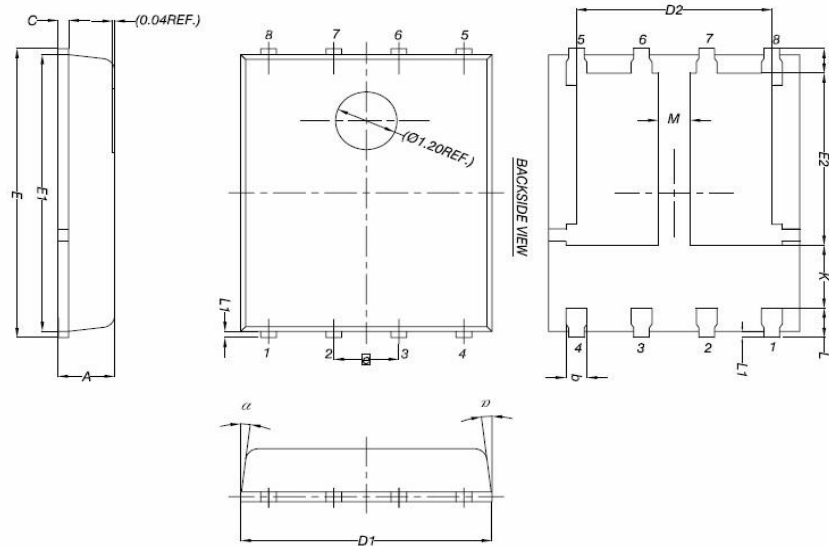


**Figure 10 Power De-rating**



**Figure 11 Normalized Maximum Transient Thermal**

**PDFN5\*6-8L**



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.90	1.00	1.10
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.66	5.76	5.83
E2	3.37	3.47	3.58
e	1.27BSC		
H	0.41	0.51	0.61
K	1.10	--	--
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
M	0.50	--	--
a	0°	--	12°