

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	3.7mΩ@10V	90A
	5.3mΩ@4.5V	

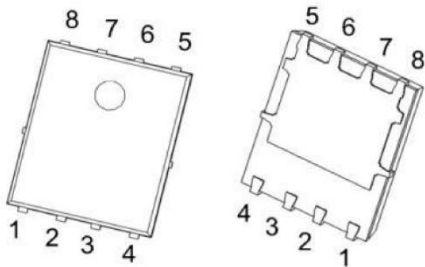
Feature

- Fast switching speed
- Surface mount package
- Reliable and Rugged

Application

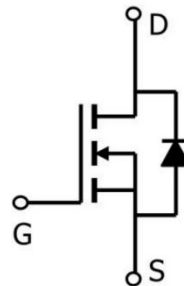
- DC-DC Converters
- Motor Control
- Portable equipment application

Package

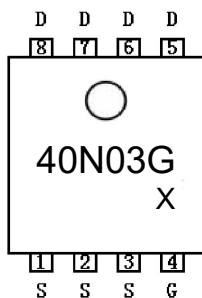


PDFN5X6-8L

Circuit diagram



Marking



Absolute maximum ratings ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^\circ\text{C}$)	I_D	90	A
Pulsed Drain Current ²⁾	I_{DM}	360	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	61.4	W
Single pulse avalanche energy ³⁾	E_{AS}	376	mJ
Thermal Resistance, Junction-to-Case ¹⁾	$R_{\theta JC}$	2.04	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

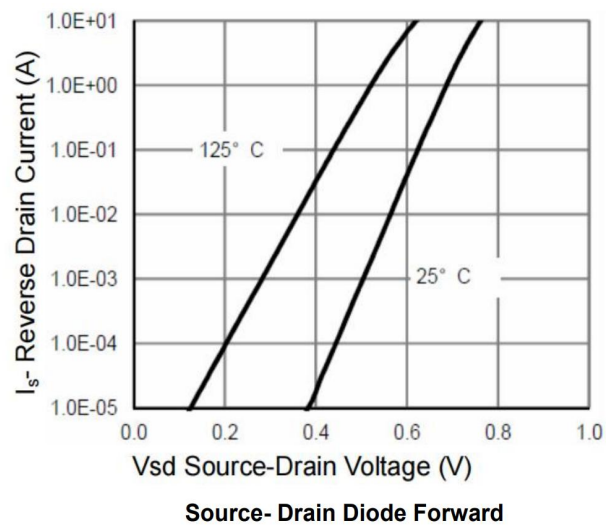
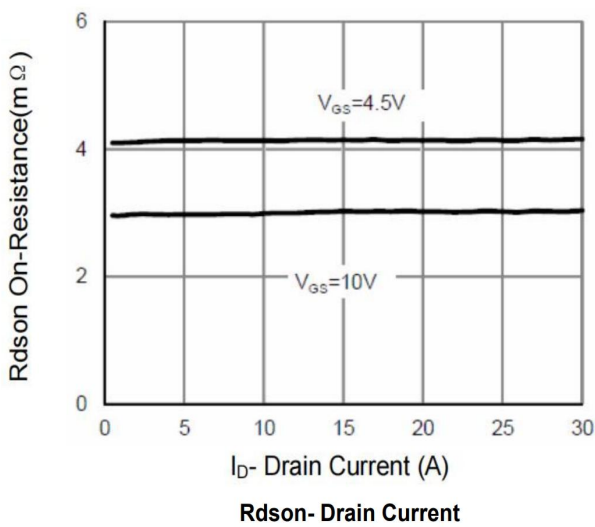
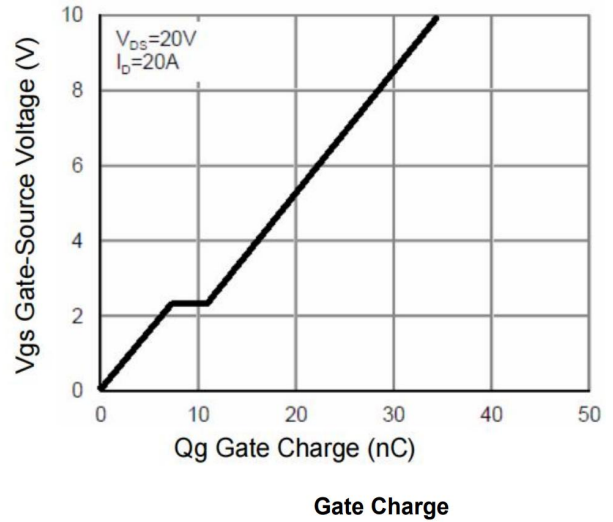
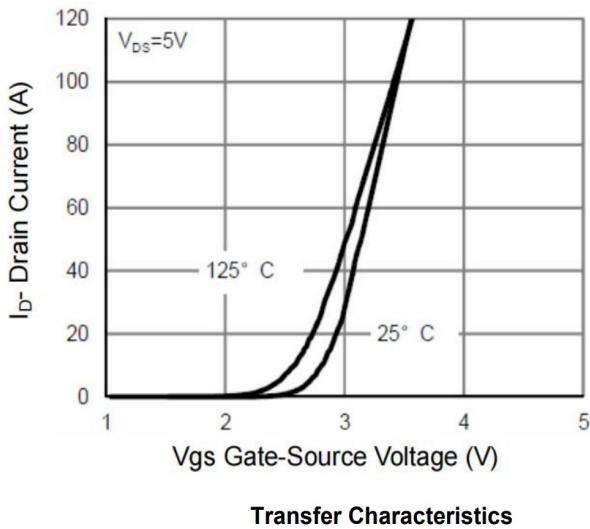
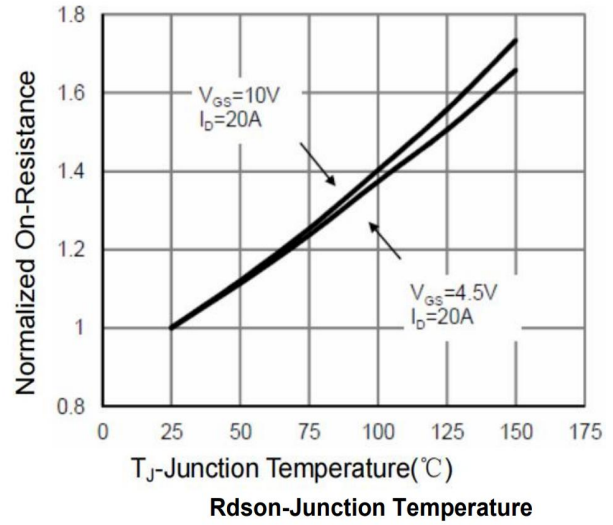
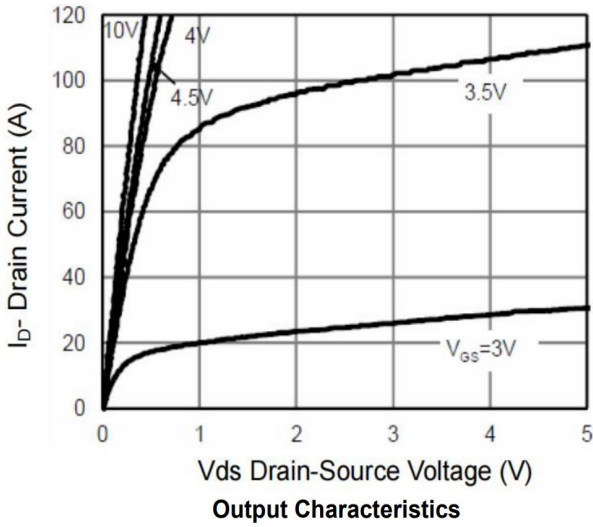
Electrical characteristics ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 32\text{V}, V_{GS} = 0\text{V}, T_J = 25^\circ\text{C}$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.0	1.5	2.5	V
Drain-source on-resistance ²⁾	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 30\text{A}$		3.0	3.7	m Ω
		$V_{GS} = 4.5\text{V}, I_D = 30\text{A}$		4.0	5.3	
Dynamic characteristics⁴⁾						
Input Capacitance	C_{iss}	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$		2800		pF
Output Capacitance	C_{oss}			720		
Reverse Transfer Capacitance	C_{rss}			40		
Total Gate Charge	Q_g	$V_{DS} = 20\text{V}, V_{GS} = 10\text{V}, I_D = 55\text{A}$		46		nC
Gate-Source Charge	Q_{gs}			8		
Gate-Drain Charge	Q_{gd}			7.5		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20\text{V}, V_{GS} = 10\text{V}, R_G = 1.6\Omega, I_D = 55\text{A}$		10		nS
Turn-on rise time	t_r			5		
Turn-off delay time	$t_{d(off)}$			32		
Turn-off fall time	t_f			5.5		
Source-Drain Diode characteristics						
Diode Forward voltage ²⁾	V_{SD}	$V_{GS} = 0\text{V}, I_S = 1\text{A}, T_J = 25^\circ\text{C}$			1.2	V

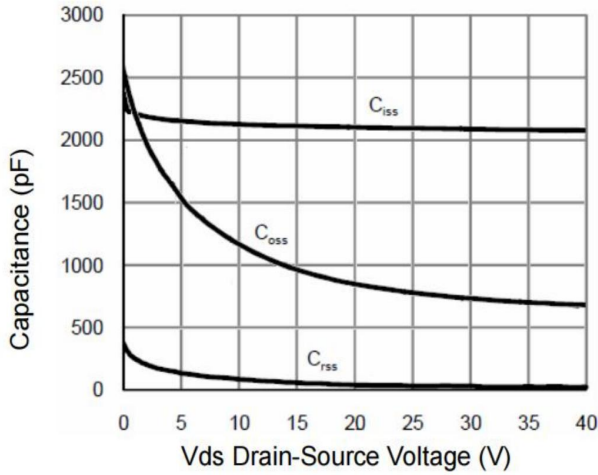
Notes:

- 1) The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
- 2) The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 3) The EAS data shows Max. rating . The test condition is $V_{DD}=20\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_G=25\Omega$.
- 4) Guaranteed by design, not subject to production.

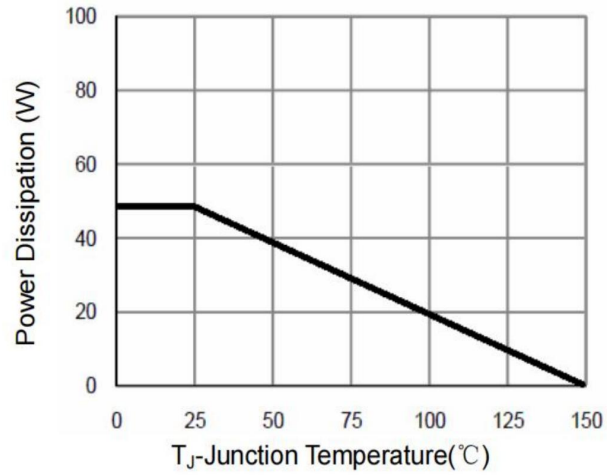
Typical Characteristics



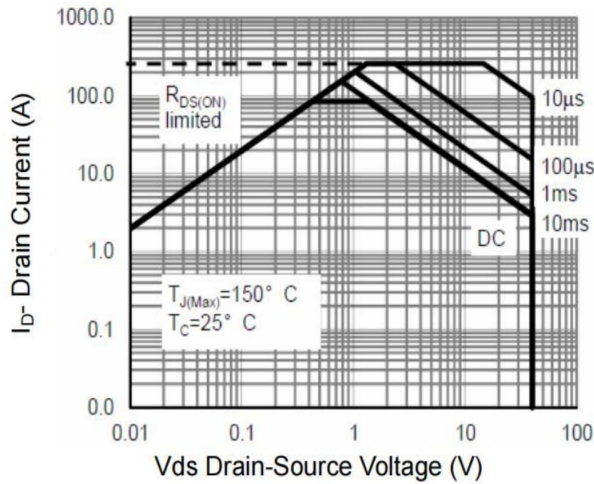
Typical Characteristics



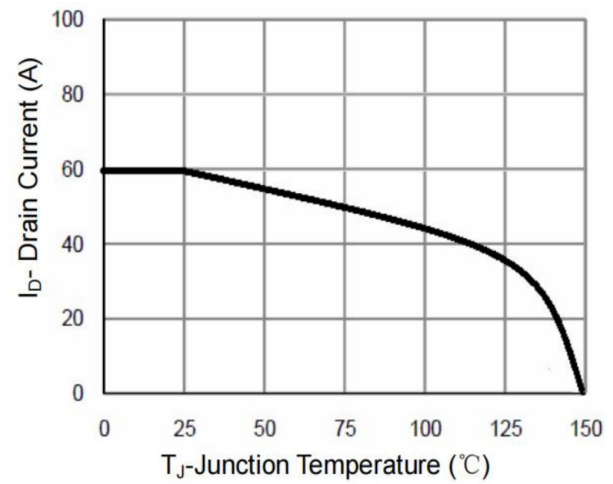
Capacitance vs Vds



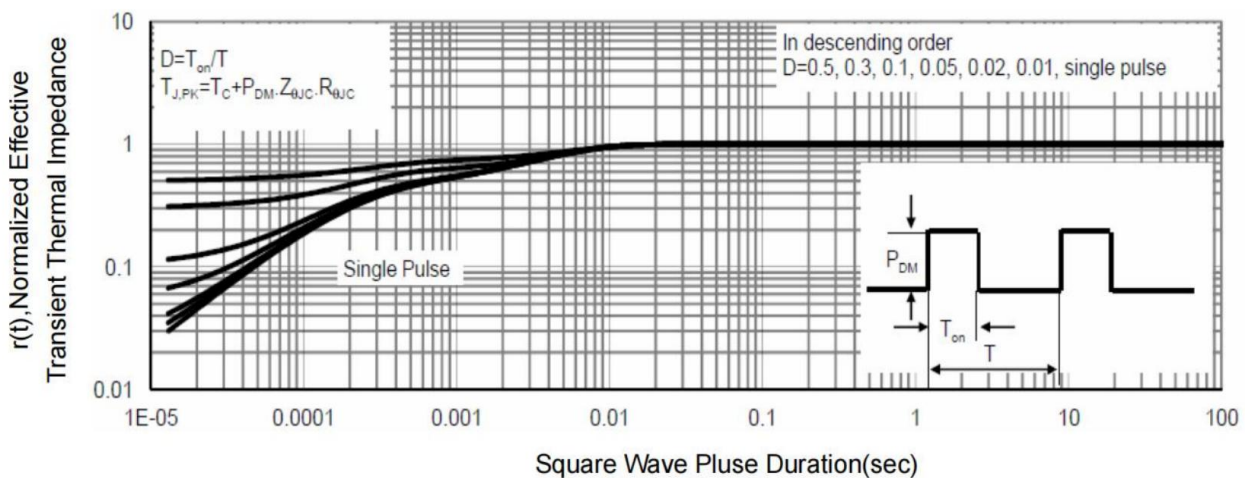
Power De-rating



Safe Operation Area

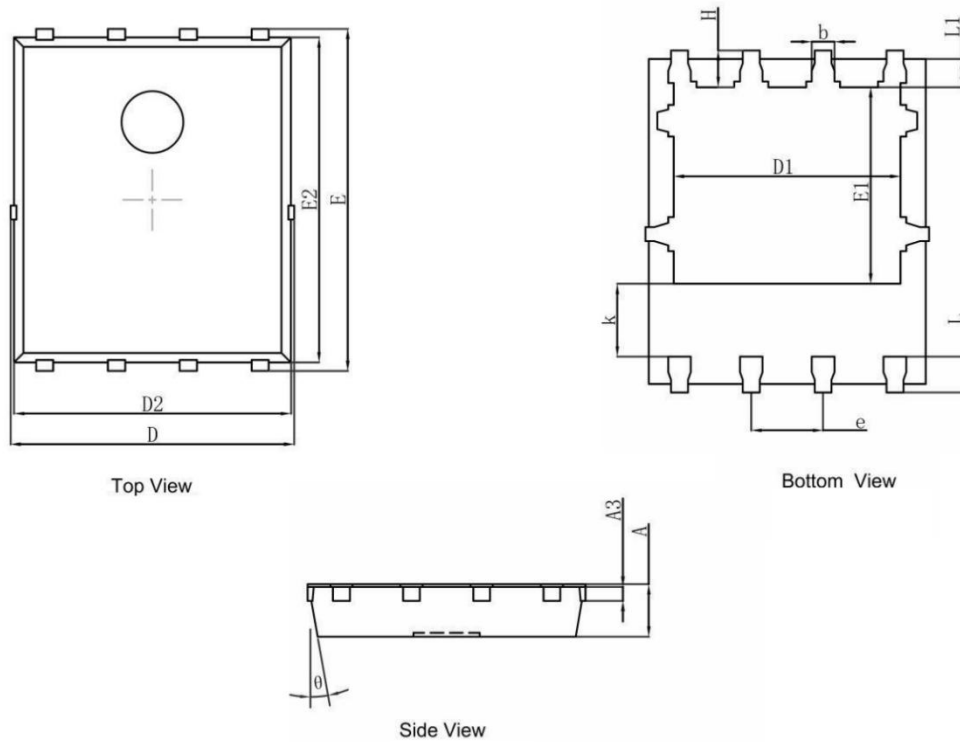


Current De-rating



Normalized Maximum Transient Thermal Impedance

PDFN5X6-8L Package Information



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	0.559	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°