Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-40V	8.6mΩ@-10V	-45A
	13mΩ@4.5V	

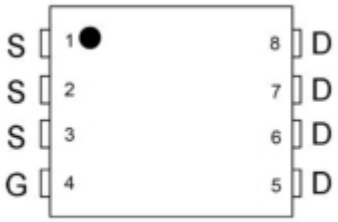
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

Applications

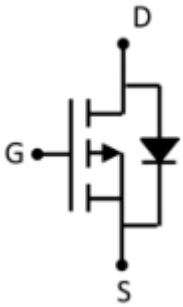
- Power switching application
- PWM Application
- DC-DC Converter

Package

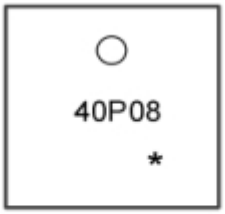


PDFN3×3-8L

Circuit diagram



Marking



40P08 : Product code
* : Month code

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	-45	A
Pulsed Drain Current	I_{DM}	-180	A
Maximum Power Dissipation (Tc=25℃)	P_D	80	W
Single pulse avalanche energy [1]	E_{AS}	600	mJ
Thermal Resistance, Junction-to-Case [2]	$R_{\theta JC}$	1.56	℃/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	℃

Electrical characteristics

(T_A=25℃, unless otherwise noted)

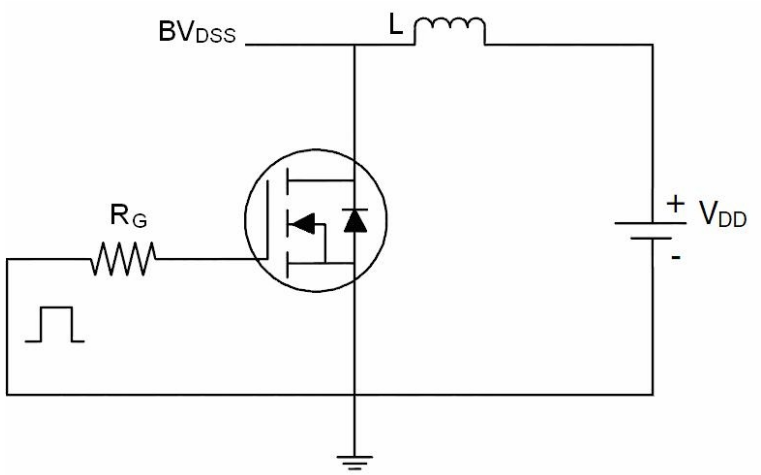
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =-40V, V_{GS} = 0V			-1	uA
Gate-Source Leakage	I_{GSS}	V_{GS} =±20V, V_{DS} =0V			±100	uA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-1.2	-1.6	-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-10A		8.6	11	mΩ
		V_{GS} =-4.5V, I_D =-8A		13	18	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-20V, f=1MHz		4004		pF
Output Capacitance	C_{oss}			309		
Reverse Transfer Capacitance	C_{rss}			229		
Switching Characteristics						
Turn-on Delay Time	$T_{d(on)}$	V_{DD}=-20V, I_D=-10A , V_{GS}=-10V, R_G=3Ω		9.9		nS
Turn-on Rise Time	T_r			32		
Turn-off Delay Time	$T_{d(off)}$			46		
Turn-off Fall Time	T_f			53		
Total Gate Charge (V_{GS}=-4.5V)	Q_g	V_{DS} =-20V, , I_D=-20A V_{GS}=-10V		31		nC
Total Gate Charge (V_{GS}=-10V)	Q_g			67		
Gate-Source Charge	Q_{gs}			13.2		
Gate-Drain Charge	Q_{gd}			11		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-60A			-1.2	V

Note:

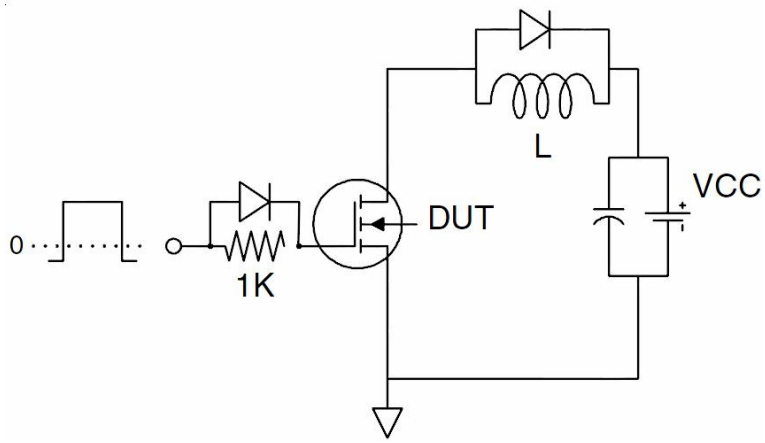
1. E_{AS} condition: T_j=25℃,V_{DD} =-20V,V_G =-10V,L=1mH,R_g =25Ω
2. Surface Mounted on FR4 Board, t ≤ 10 sec.

Test Circuits

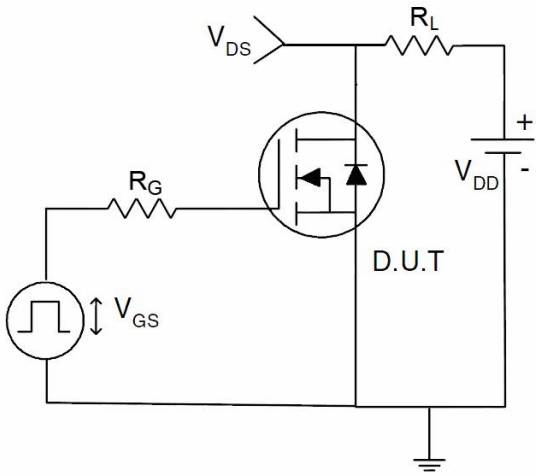
- EAS Test Circuits



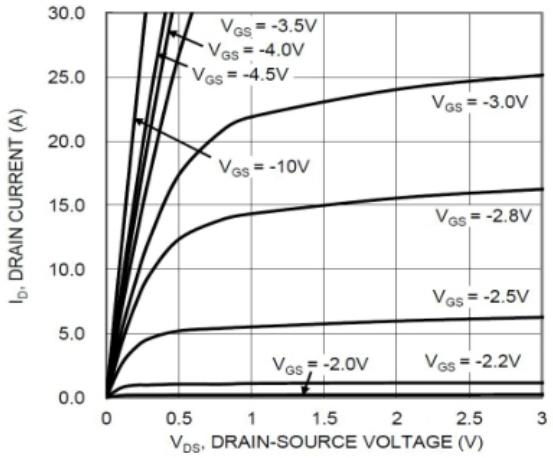
- Gate Charge Test Circuit



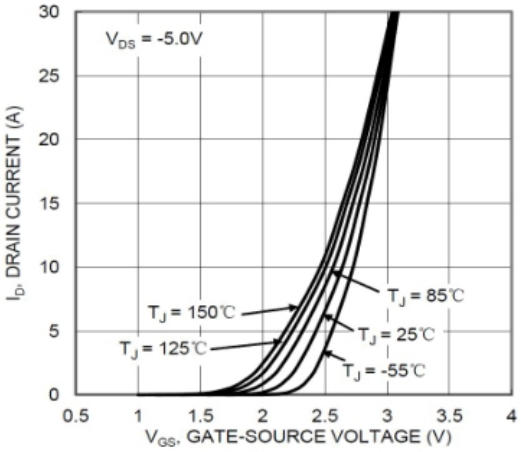
- Switch Time Test Circuit



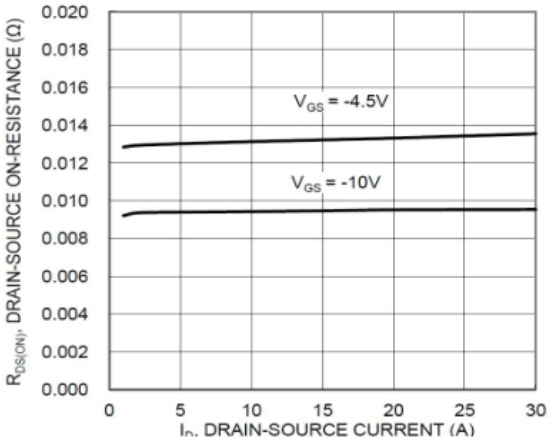
Typical Characteristics



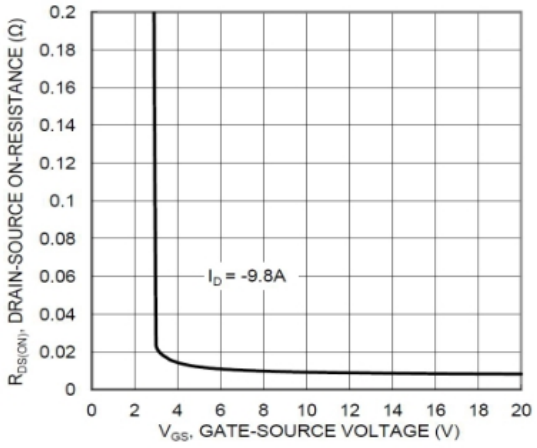
Typical Output Characteristic



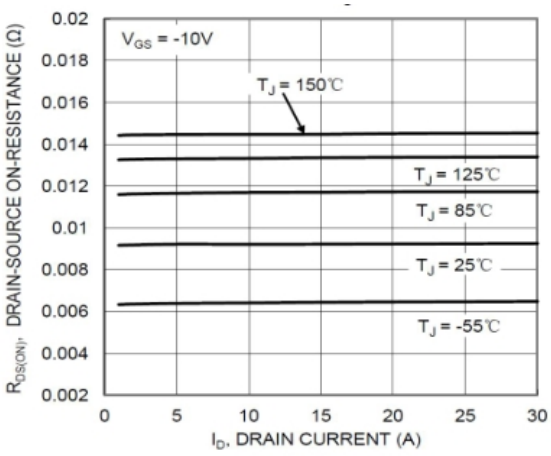
Typical Transfer Characteristic



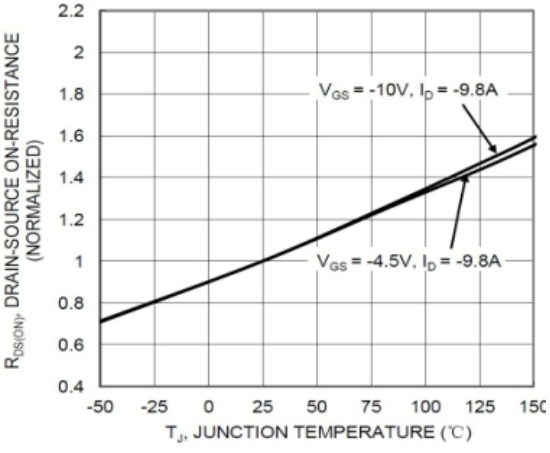
Typical On-Resistance vs. Drain Current and Gate Voltage



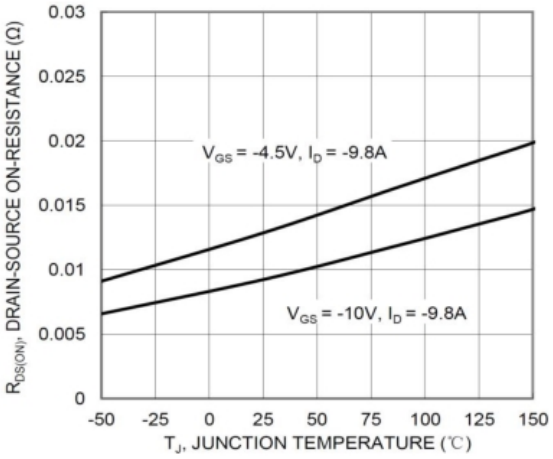
Typical Transfer Characteristic



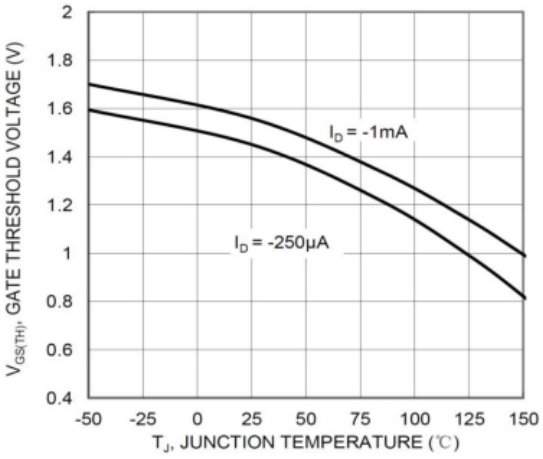
Typical On-Resistance vs. Drain Current and Temperature



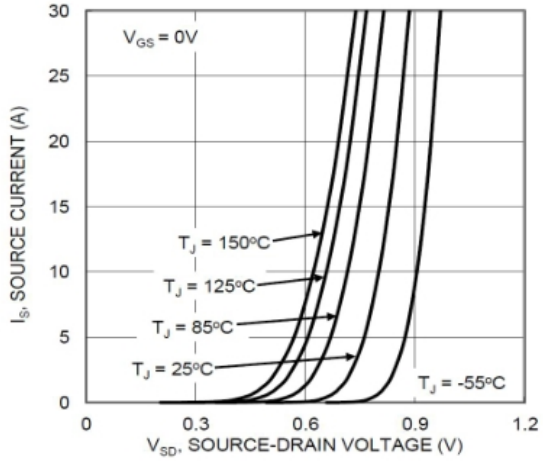
On-Resistance Variation with Temperature



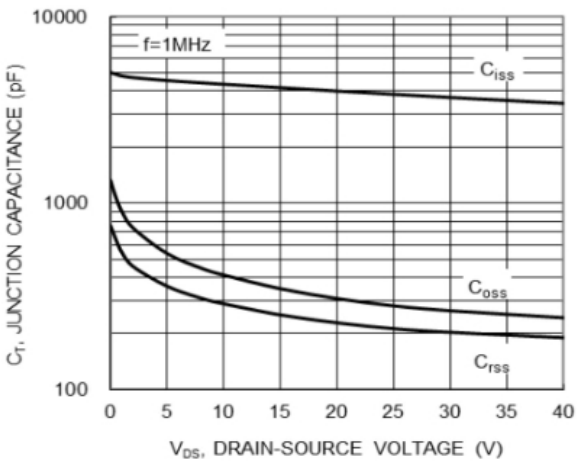
On-Resistance Variation withTemperature



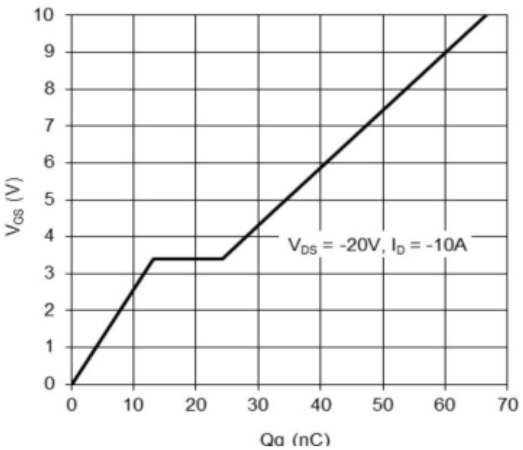
Gate Threshold Variation vs. Junction Temperature



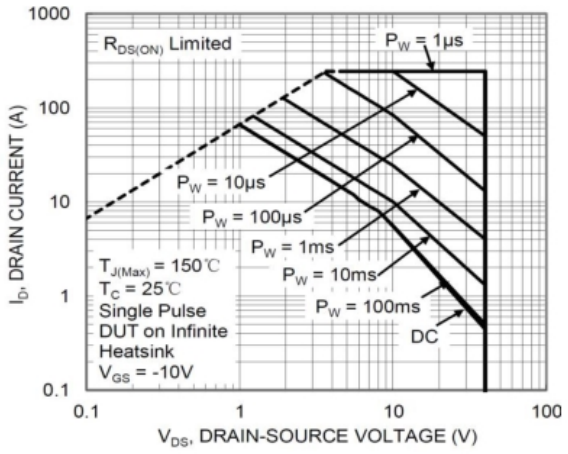
Diode Forward Voltage vs. Current



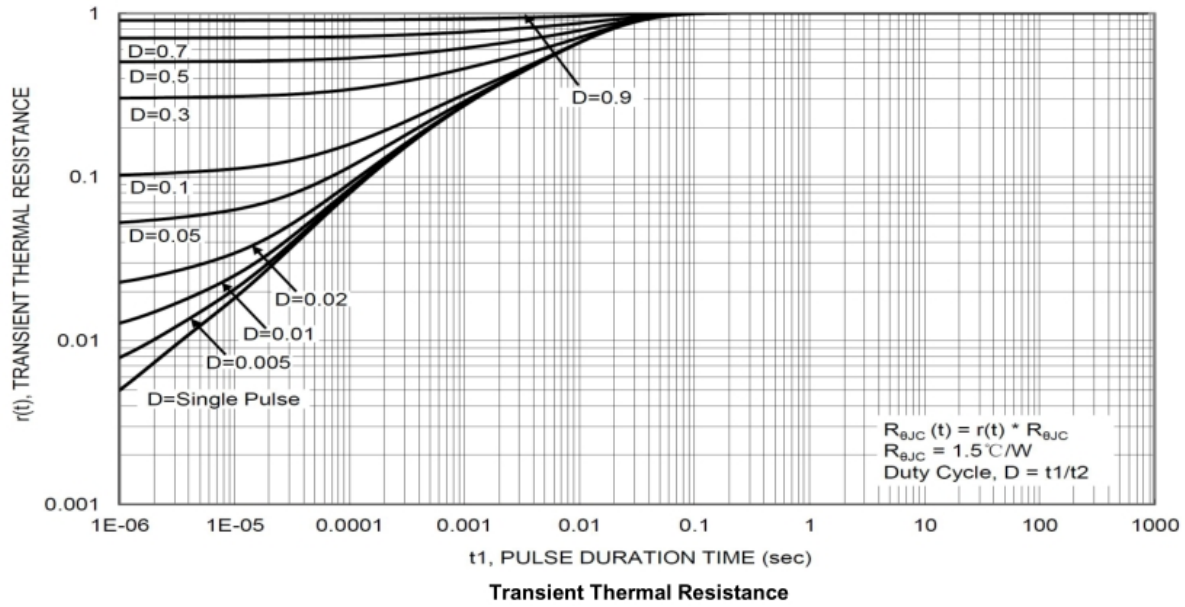
Typical Junction capacitance



Gate Charge

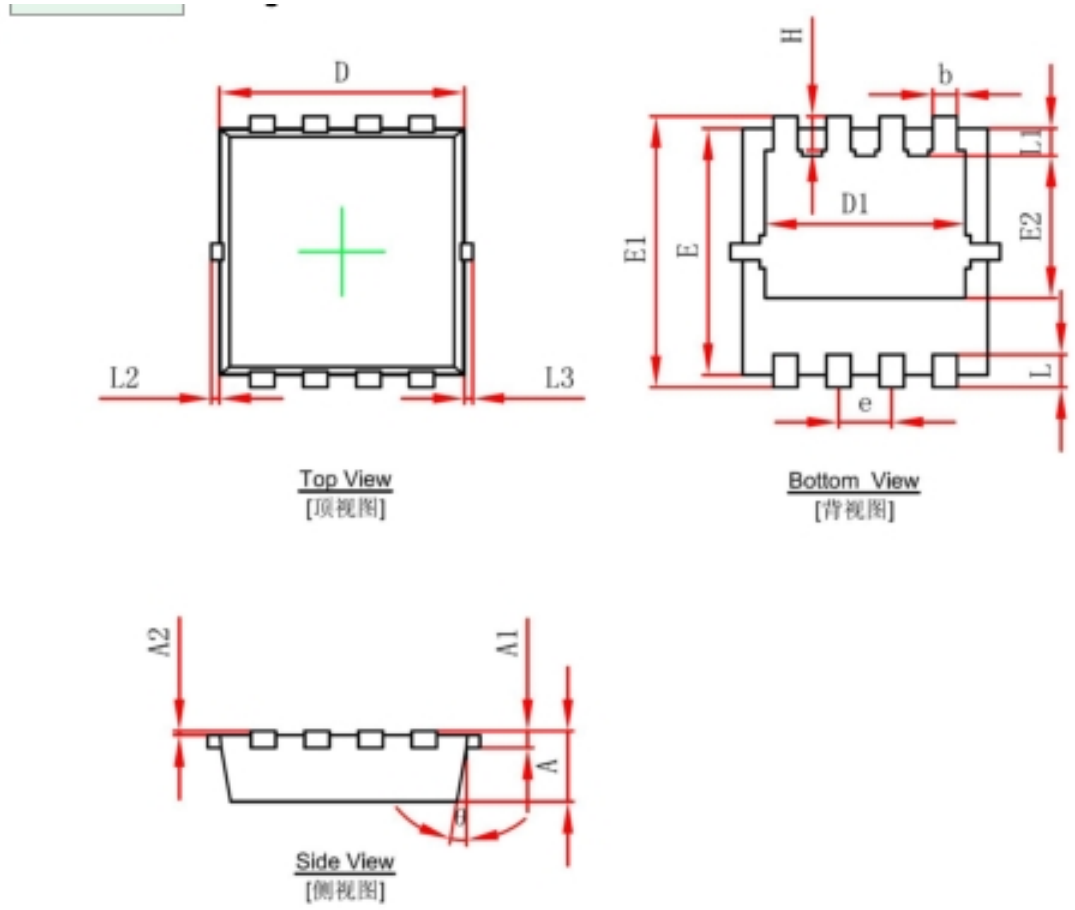


Safe Operation Area



Transient Thermal Resistance

PDFN3×3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°