

### Product Summary

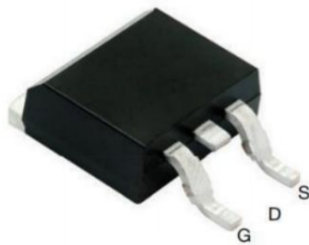
- $V_{DS}$  -100 V
- $I_{DS}$  -20A
- $R_{DS(ON)}$  (at  $V_{GS} = -10V$ ) 100m $\Omega$  (typ)

### Application

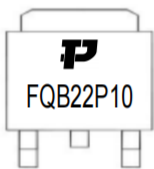
- DC/DC Converter
- Portable equipment and batt
- Power Switch

### Package and Pin Configuration

TO-263



Marking

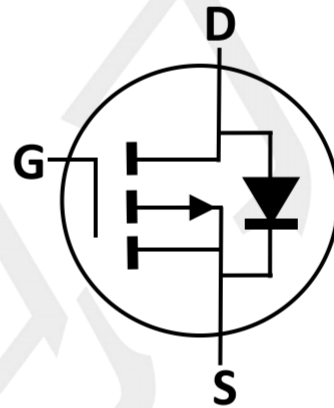


Or



xxx is internal code

### Circuit diagram



Equivalent Circuit

### Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DS}$	-100	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	-20	A
Pulsed Drain Current (note1)	$I_{DM}$	-55	A
Maximum Power Dissipation	$P_D$	79	W
Operating Junction Temperature Range	$T_J$	-55 to +150	°C
Storage Temperature Range	$T_{stg}$	-55 to +150	°C

### Thermal Characteristic

PARAMETER	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient (t <sub>1</sub> ≤10s)	$R_{\theta JA}$	50	°C/W
	PCB Mount (note2)		

notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. When mounted on 1" square PCB (FR4 material).

### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

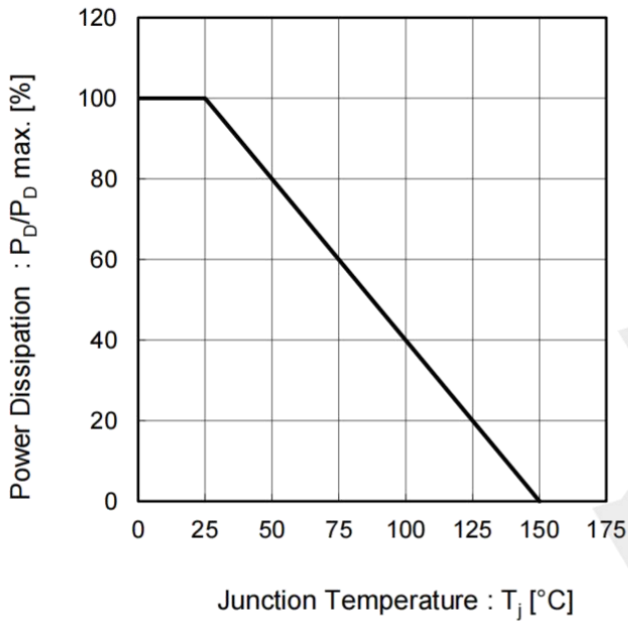
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	BV <sub>DSS</sub>	-100	--	--	V
Gate-Source Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> = -250μA	V <sub>GS(th)</sub>	-2	-3	-4	V
Gate-Source Leakage	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±20V	I <sub>GSS</sub>	--	--	±100	nA
Zero Gate Voltage Drain Current	V <sub>DS</sub> = -80V, V <sub>GS</sub> =0V	I <sub>DSS</sub>	--	-0.1	-1	μA
	V <sub>DS</sub> = -80V, T <sub>J</sub> =125°C		--	-10	-100	μA
Drain-Source On-State Resistance (Note 1)	V <sub>GS</sub> = -10V, I <sub>D</sub> = -1A	R <sub>DS(on)</sub>	--	100	120	mΩ
	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1A		--	120	180	
Forward Transconductance (Note 2)	V <sub>DS</sub> = -5V, I <sub>D</sub> = -15A	g <sub>fs</sub>	--	26	--	S
<b>Dynamic (Note 2)</b>						
Total Gate Charge (Note 3)	V <sub>DS</sub> = -50V, I <sub>D</sub> = -15A, V <sub>GS</sub> = -10V	Q <sub>g</sub>	--	64	--	nC
Gate-Source Charge (Note 3)		Q <sub>gs</sub>	--	10	--	
Gate-Drain Charge (Note 3)		Q <sub>gd</sub>	--	12	--	
Input Capacitance	V <sub>DS</sub> = -50V, V <sub>GS</sub> = 0V, F = 1.0MHz	C <sub>iss</sub>	--	3800	--	pF
Output Capacitance		C <sub>oss</sub>	--	162	--	
Reverse Transfer Capacitance		C <sub>rss</sub>	--	100	--	
<b>Switching</b>						
Turn-On Delay Time (Note 3)	V <sub>DD</sub> = -50V, I <sub>D</sub> = -15A, V <sub>GS</sub> = -10V, R <sub>GEN</sub> = 6Ω	t <sub>d(on)</sub>	--	30	--	nS
Rise Time (Note 3)		t <sub>r</sub>	--	40	--	
Turn-Off Delay Time (Note 3)		t <sub>d(off)</sub>	--	165	--	
Fall Time (Note 3)		t <sub>f</sub>	--	96	--	
<b>Source-Drain Diode Ratings and Characteristics (Note 2)</b>						
Forward Voltage	V <sub>GS</sub> = 0V, I <sub>SD</sub> = -15A	V <sub>SD</sub>	--	-0.75	-1.2	V
Continuous Source Current	Integral reverse diode in the MOSFET	I <sub>S</sub>	--	--	-20	A
Pulsed Current (Note 1)		I <sub>SM</sub>	--	--	-55	A

Notes:

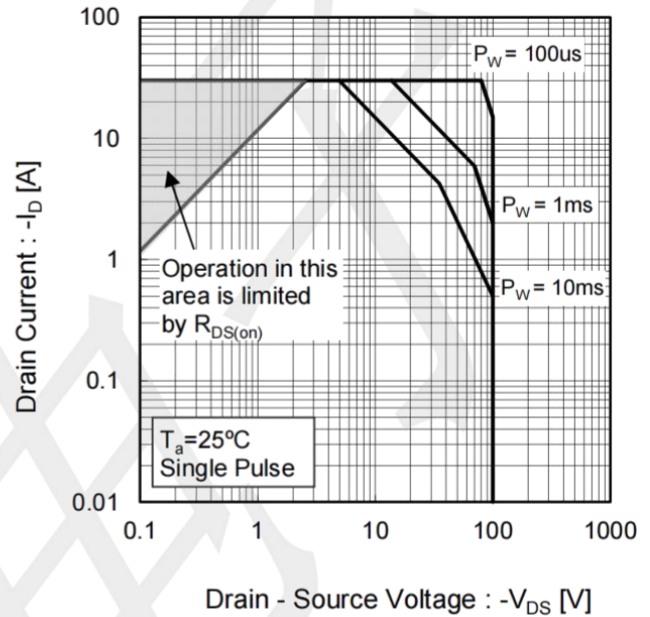
1. Pulse test; pulse width ≤ 300 μS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

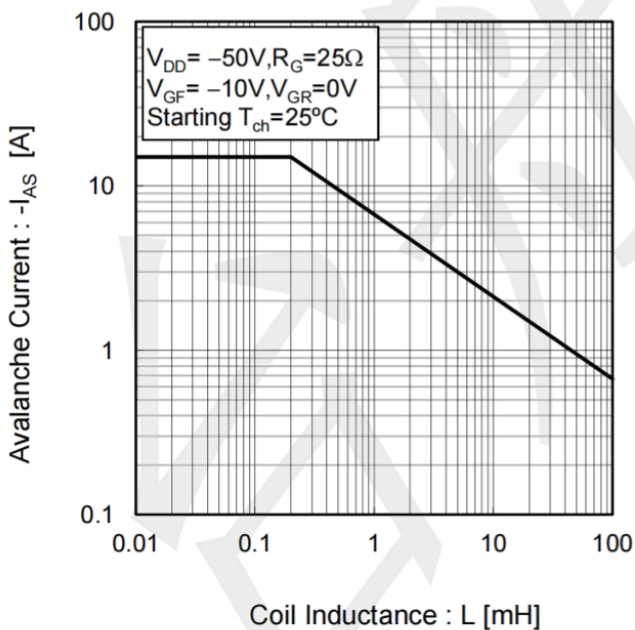
Power Dissipation Derating Curve



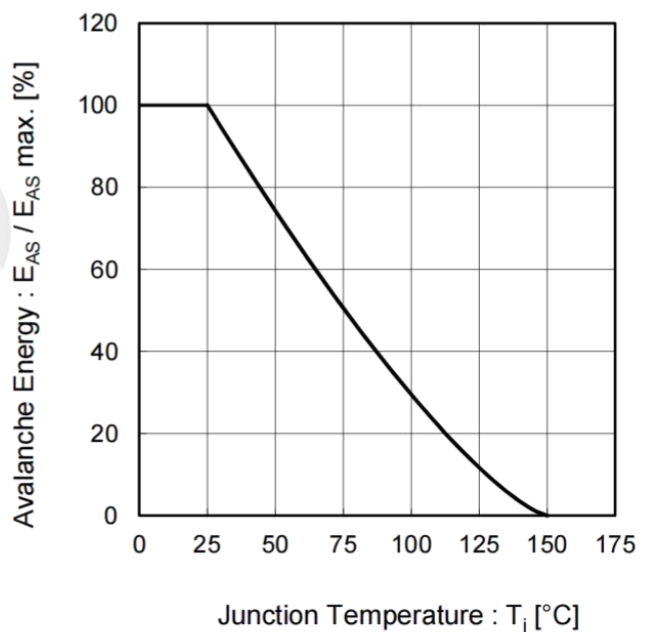
Maximum Safe Operating Area



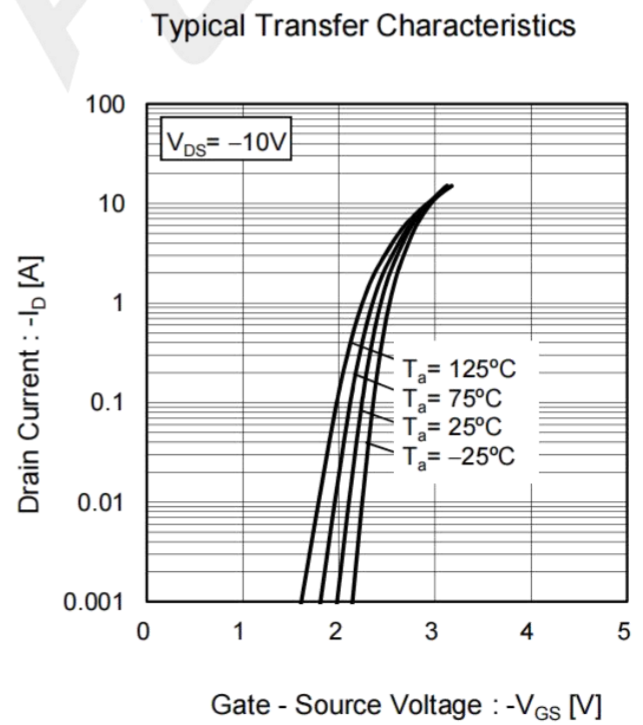
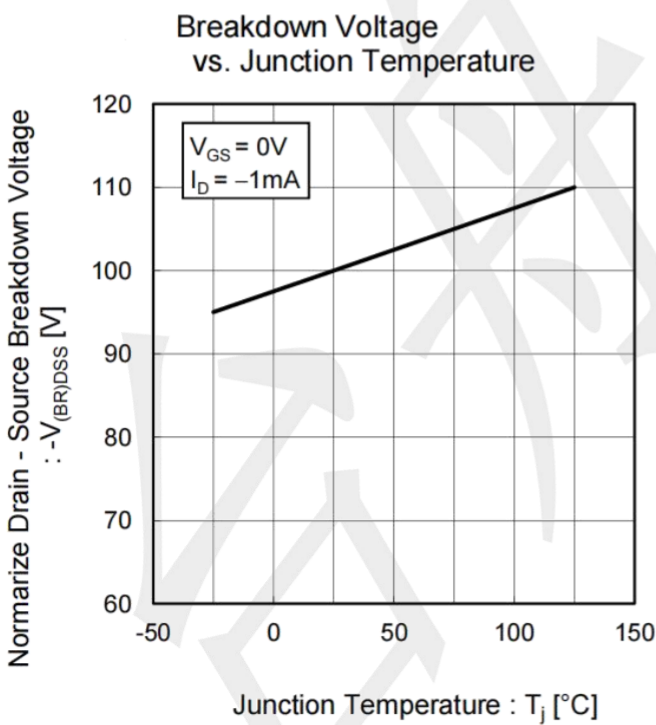
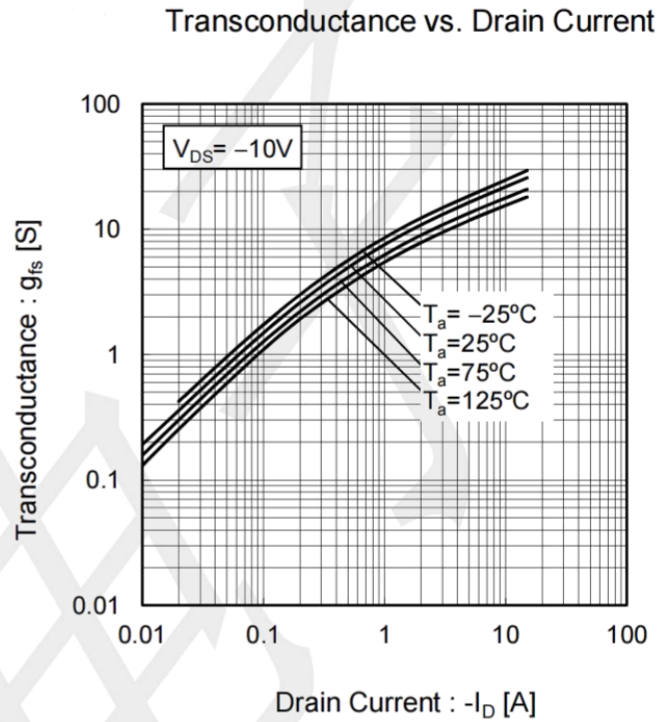
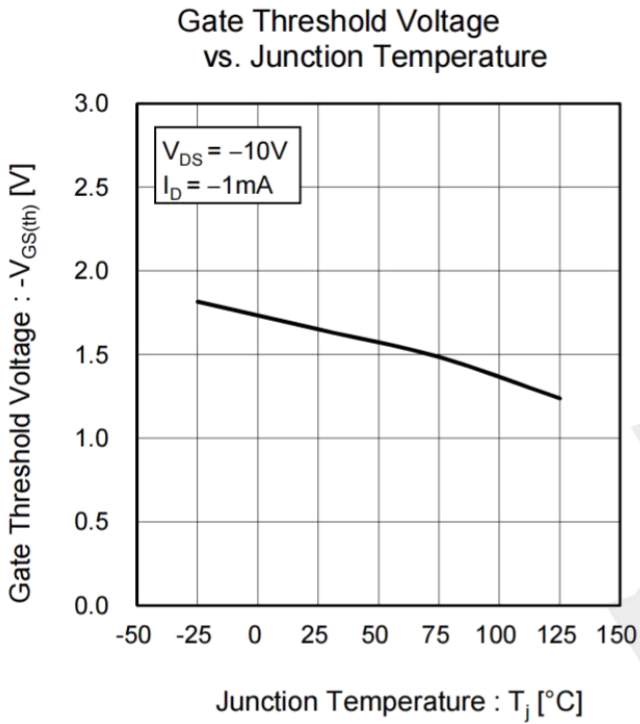
Avalanche Current vs Inductive Load



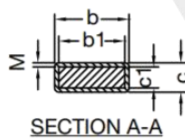
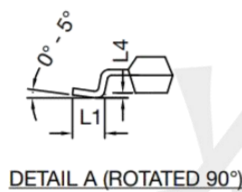
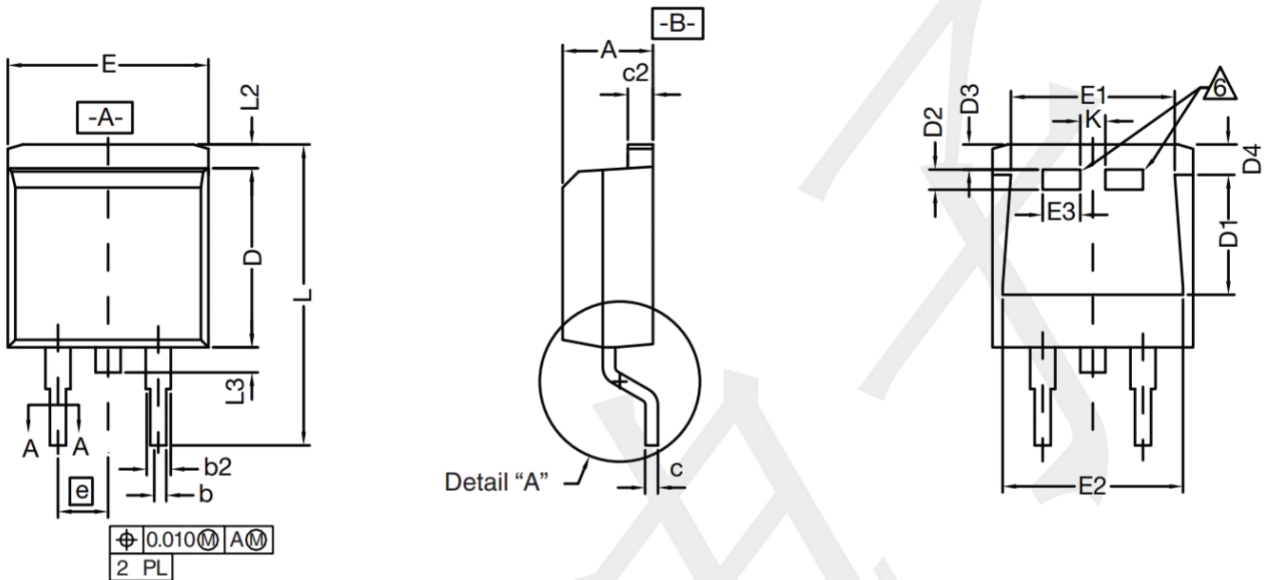
Avalanche Energy Derating Curve vs Junction Temperature



### TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)




### Package Information TO-263



DIM.	INCHES		MILLIMETERS		
	MIN.	MAX.	MIN.	MAX.	
A	0.160	0.190	4.064	4.826	
b	0.020	0.039	0.508	0.990	
b1	0.020	0.035	0.508	0.889	
b2	0.045	0.055	1.143	1.397	
c*	Thin lead	0.013	0.018	0.330	0.457
	Thick lead	0.023	0.028	0.584	0.711
c1	Thin lead	0.013	0.017	0.330	0.431
	Thick lead	0.023	0.027	0.584	0.685
c2	0.045	0.055	1.143	1.397	
D	0.340	0.380	8.636	9.652	
D1	0.220	0.240	5.588	6.096	
D2	0.038	0.042	0.965	1.067	
D3	0.045	0.055	1.143	1.397	
D4	0.044	0.052	1.118	1.321	
E	0.380	0.410	9.652	10.414	
E1	0.245	-	6.223	-	
E2	0.355	0.375	9.017	9.525	
E3	0.072	0.078	1.829	1.981	
e	0.100 BSC		2.54 BSC		
K	0.045	0.055	1.143	1.397	
L	0.575	0.625	14.605	15.875	
L1	0.090	0.110	2.286	2.794	
L2	0.040	0.055	1.016	1.397	
L3	0.050	0.070	1.270	1.778	
L4	0.010 BSC		0.254 BSC		
M	-	0.002	-	0.050	

#### Notes

- Plane B includes maximum features of heat sink tab and plastic.
- No more than 25 % of L1 can fall above seating plane by max. 8 mils.
- Pin-to-pin coplanarity max. 4 mils.
- \*: Thin lead is for SUB, SYB.  
Thick lead is for SUM, SYM, SQM.
- Use inches as the primary measurement.
-  This feature is for thick lead.

ECN: T13-0707-Rev. K, 30-Sep-13  
DWG: 5843