P-Channel 12-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
−12	0.016 @ V_{GS} = −4.5 V	−12.6
	0.022 @ V_{GS} = −2.5 V	−10.8
	0.029 @ V_{GS} = −1.8 V	−3.5

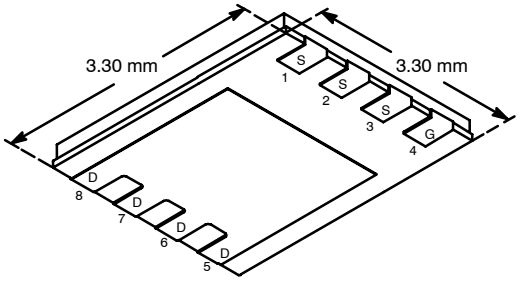
FEATURES

- TrenchFET® Power MOSFETS: 1.8-V Rated
- New PowerPAK® Package
  - Low Thermal Resistance, R_{thJC}
  - Low 1.07-mm Profile

APPLICATIONS

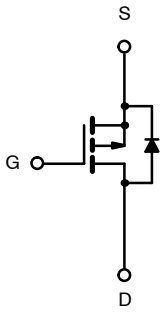
- Load Switch
- PA Switch
- Battery Switch

PowerPAK® 1212-8



Bottom View

Ordering Information: Si7425DN-T1—E3



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	−12		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current (T_J = 150°C)[a]	T_A = 25°C	I_D	−12.6	−8.3	A
	T_A = 85°C		−9.1	−6.0	
Pulsed Drain Current		I_{DM}	−25		
continuous Source Current (Diode Conduction)[a]		I_S	−3.0	−1.3	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	3.6	1.5	W
	T_A = 85°C		1.9	0.8	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 150		°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[a]	t ≤ 10 sec	R_{thJA}	28	35	°C/W
	Steady State		65	81	
Maximum Junction-to-Case	Steady State	R_{thJC}	2.9	3.8	

Notes
a. Surface Mounted on 1" x 1" FR4 Board.

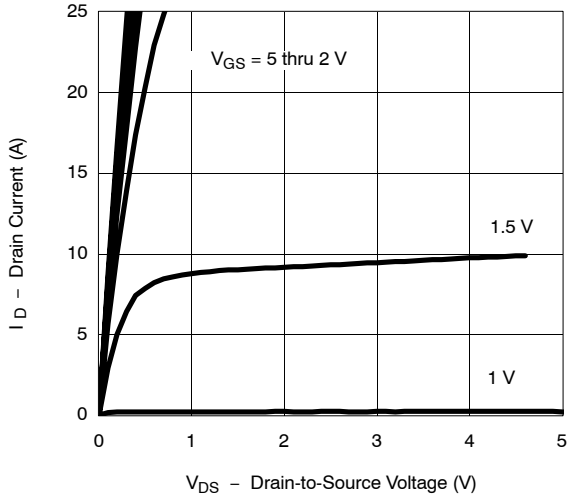
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –300 μA	–0.40		–1.0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –12 V, V_{GS} = 0 V			–1	μA
		V_{DS} = –12 V, V_{GS} = 0 V, T_J = 85°C			–5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ –5 V, V_{GS} = –4.5 V	–25			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = –4.5 V, I_D = –12.6 A		0.013	0.016	Ω
		V_{GS} = –2.5 V, I_D = –10.8 A		0.017	0.022	
		V_{GS} = –1.8 V, I_D = –3.5 A		0.023	0.029	
Forward Transconductance[a]	g_{fs}	V_{DS} = –6 V, I_D = –12.6 A		38		S
Diode Forward Voltage[a]	V_{SD}	I_S = –3.0 A, V_{GS} = 0 V		–0.7	–1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = –6 V, V_{GS} = –4.5 V, I_D = –12.6 A		26	39	nC
Gate-Source Charge	Q_{gs}			4.1		
Gate-Drain Charge	Q_{gd}			7.0		
Gate Resistance	R_g	f = 1 MHz		5.0		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = –6 V, R_L = 6 Ω I_D ≅ –1 A, V_{GEN} = –4.5 V, R_G = 6 Ω		30	45	ns
Rise Time	t_r			55	75	
Turn-Off Delay Time	$t_{d(off)}$			130	260	
Fall Time	t_f			100	225	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = –3.2 A, di/dt = 100 A/μs		52	80	

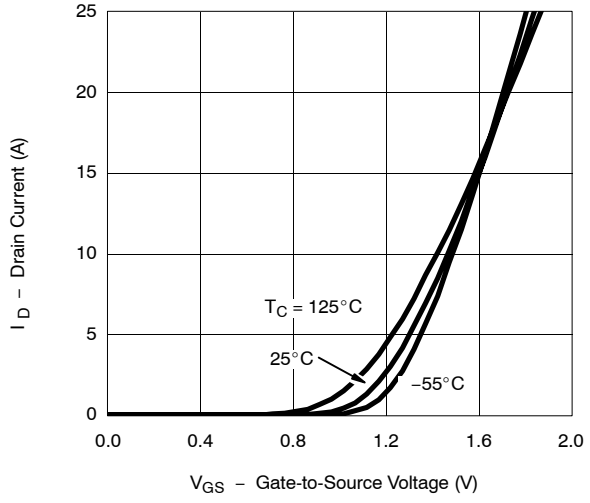
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

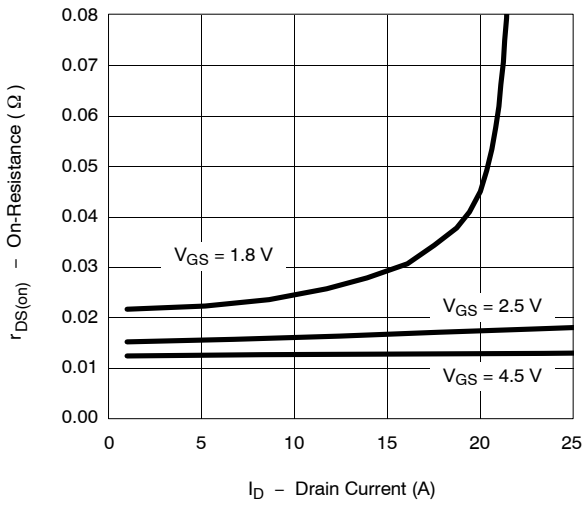


Transfer Characteristics

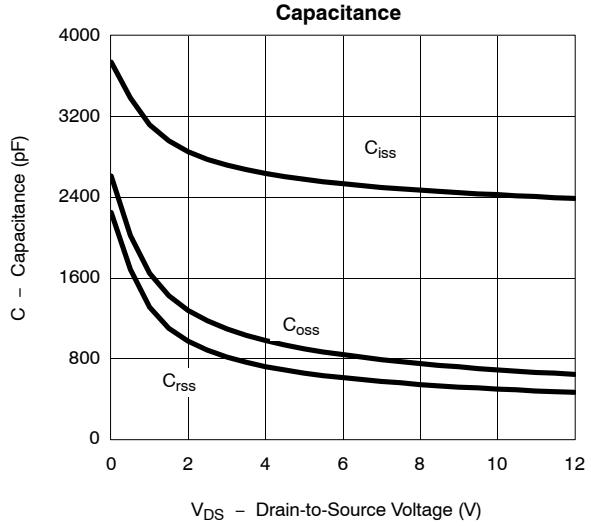


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

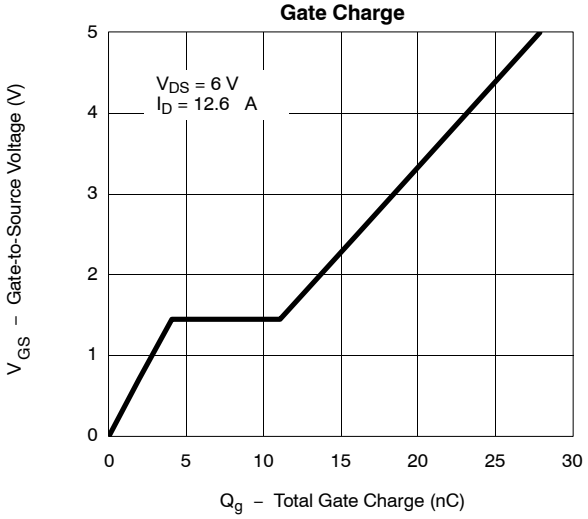
On-Resistance vs. Drain Current



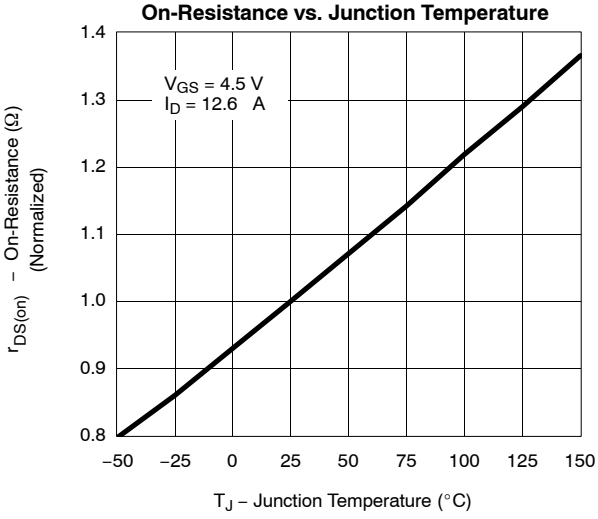
Capacitance



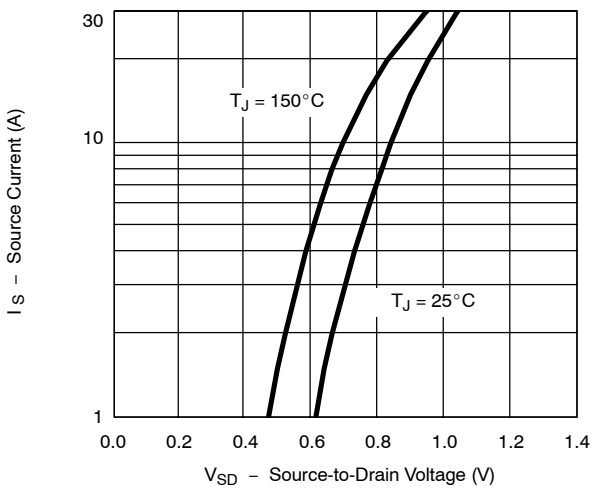
Gate Charge



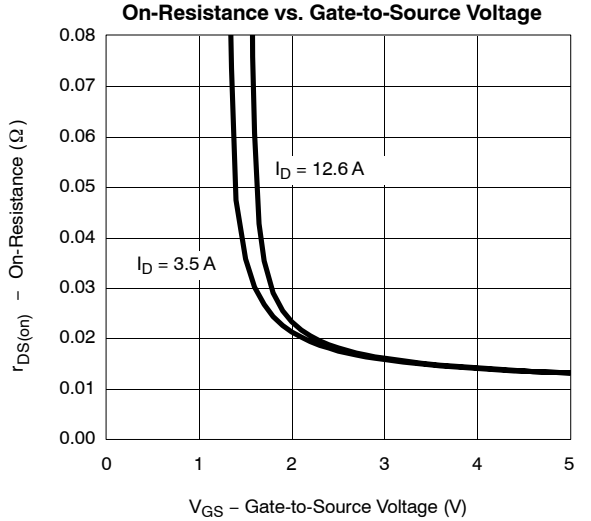
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

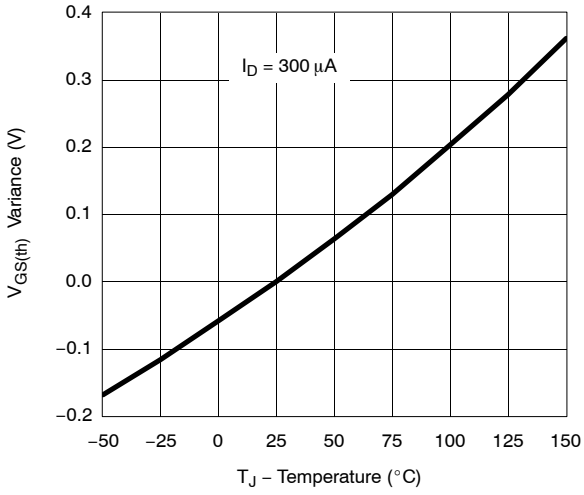


On-Resistance vs. Gate-to-Source Voltage

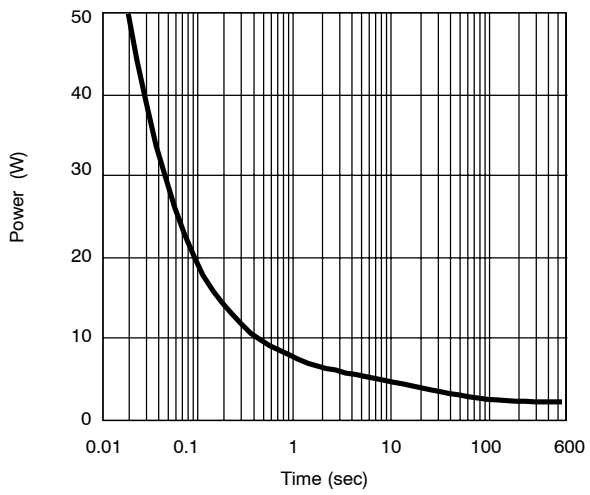


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

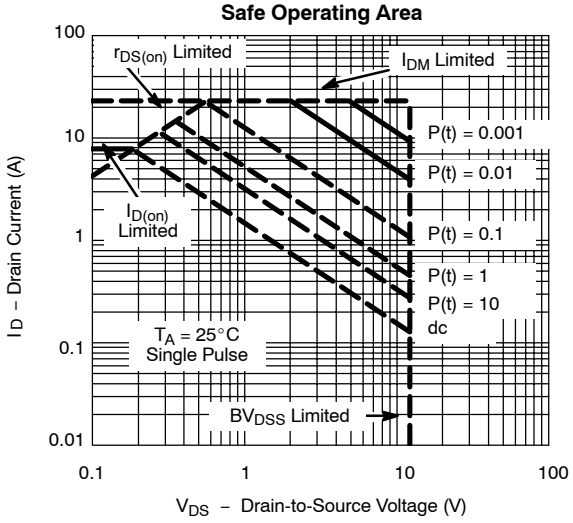
Threshold Voltage



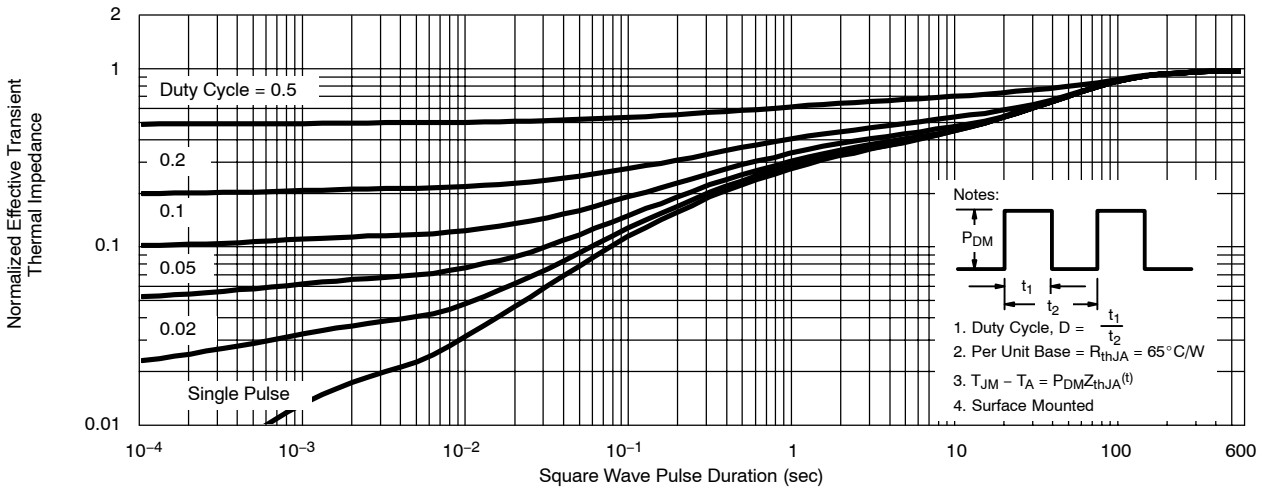
Single Pulse Power, Juncion-To-Ambient



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)