



New Product

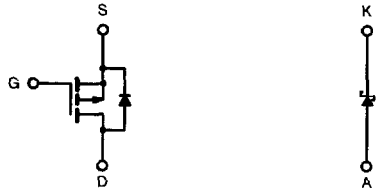
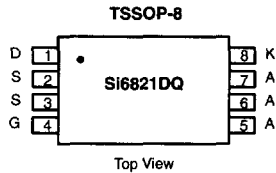
Si6821DQ  
Vishay Siliconix

P-Channel, Reduced  $Q_g$ , MOSFET with Schottky Diode

MOSFET PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-20	0.190 @ $V_{GS} = -4.5$ V	$\pm 1.7$
	0.280 @ $V_{GS} = -3.0$ V	$\pm 1.3$

SCHOTTKY PRODUCT SUMMARY		
$V_{KA}$ (V)	$V_F$ (V) Diode Forward Voltage	$I_F$ (A)
20	0.5 V @ 1 A	1.5

LITTLE FOOT PLUS™



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage (MOSFET)		$V_{DS}$	-20	V
Reverse Voltage (Schottky)		$V_{KA}$	20	
Gate-Source Voltage (MOSFET)		$V_{GS}$	$\pm 12$	
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) (MOSFET) <sup>a, b</sup>	$T_A = 25^\circ\text{C}$	$I_D$	$\pm 1.7$	A
	$T_A = 70^\circ\text{C}$		$\pm 1.3$	
Pulsed Drain Current (MOSFET)		$I_{DM}$	$\pm 8$	
Continuous Source Current (MOSFET Diode Conduction) <sup>a, b</sup>		$I_S$	-1.0	
Average Forward Current (Schottky)		$I_F$	1.5	
Pulsed Forward Current (Schottky)		$I_{FM}$	30	
Maximum Power Dissipation (MOSFET) <sup>a, b</sup>	$T_A = 25^\circ\text{C}$	$P_D$	1.2	
	$T_A = 70^\circ\text{C}$		0.76	
Maximum Power Dissipation (Schottky) <sup>a, b</sup>	$T_A = 25^\circ\text{C}$		1.0	
	$T_A = 70^\circ\text{C}$		0.64	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter	Device	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ( $t \leq 10$ sec) <sup>a</sup>	MOSFET	$R_{\theta JA}$	115	105	$^\circ\text{C/W}$
	Schottky			125	
Maximum Junction-to-Ambient ( $t = \text{steady state}$ ) <sup>a</sup>	MOSFET			130	
	Schottky			130	

Notes  
a. Surface Mounted on FR4 Board.  
b.  $t \leq 10$  sec.



MOSFET SPECIFICATIONS (T <sub>J</sub> = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-0.6			V
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±12 V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -20 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C			-25	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ -5 V, V <sub>GS</sub> = -4.5 V	-6			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -1.7 A		0.135	0.190	Ω
		V <sub>GS</sub> = -3.0 V, I <sub>D</sub> = -1.3 A		0.200	0.280	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1.7 A		4.0		S
Diode Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = -1 A, V <sub>GS</sub> = 0 V		-0.77	-1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = -3.5 V, V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -0.3 A		3.5	7.0	nC
Gate-Source Charge	Q <sub>gs</sub>			0.85		
Gate-Drain Charge	Q <sub>gd</sub>			0.60		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -3.5 V, R <sub>L</sub> = 11.5 Ω I <sub>D</sub> ≅ -1 A, V <sub>GEN</sub> = -4.5 V, R <sub>G</sub> = 6 Ω		7	15	ns
Rise Time	t <sub>r</sub>			10	20	
Turn-Off Delay Time	t <sub>d(off)</sub>			11	20	
Fall Time	t <sub>f</sub>			7	15	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> = -1 A, di/dt = 100 A/μs		35	

## Notes

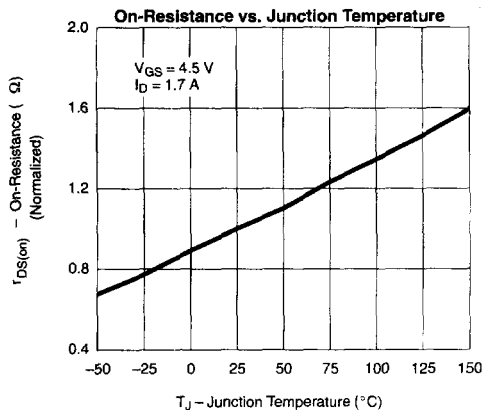
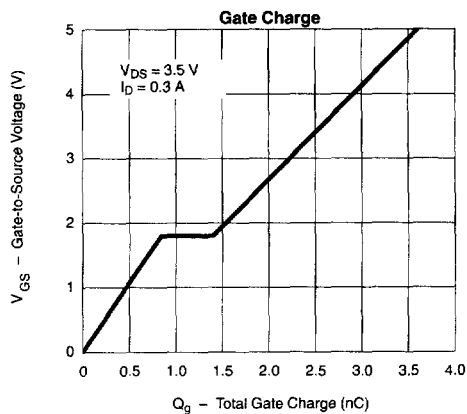
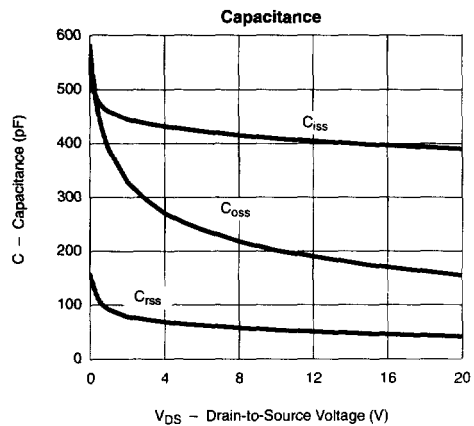
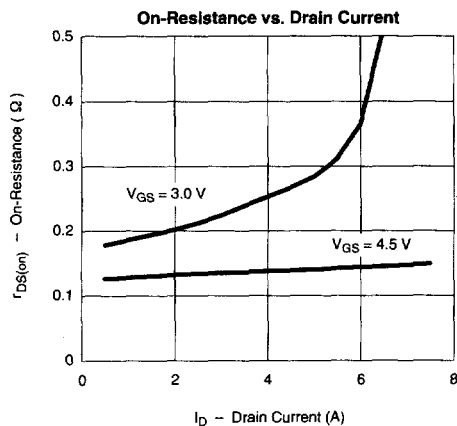
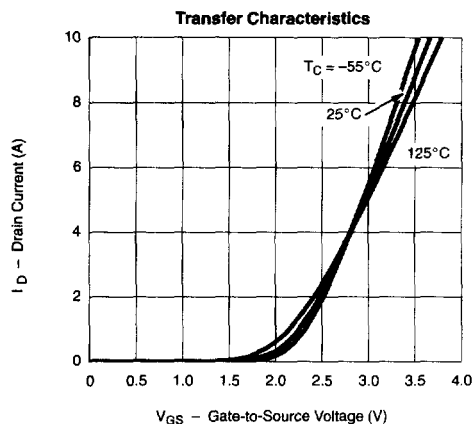
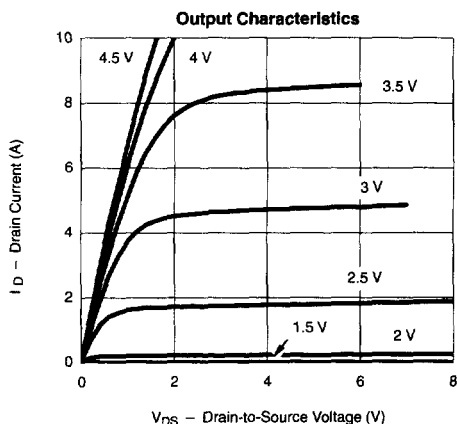
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.  
 b. Guaranteed by design, not subject to production testing.

SCHOTTKY SPECIFICATIONS (T <sub>J</sub> = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V <sub>F</sub>	I <sub>F</sub> = 1 A		0.45	0.5	V
		I <sub>F</sub> = 1 A, T <sub>J</sub> = 125°C		0.36	0.42	
Maximum Reverse Leakage Current	I <sub>m</sub>	V <sub>r</sub> = 20 V		0.003	0.100	mA
		V <sub>r</sub> = 20 V, T <sub>J</sub> = 75°C		0.1	1	
		V <sub>r</sub> = 20 V, T <sub>J</sub> = 125°C		2	10	
Junction Capacitance	C <sub>T</sub>	V <sub>r</sub> = 10 V		62		pF



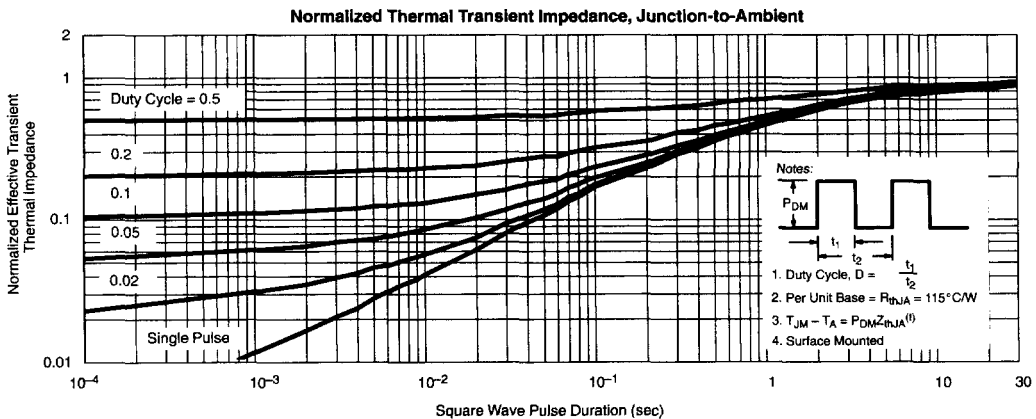
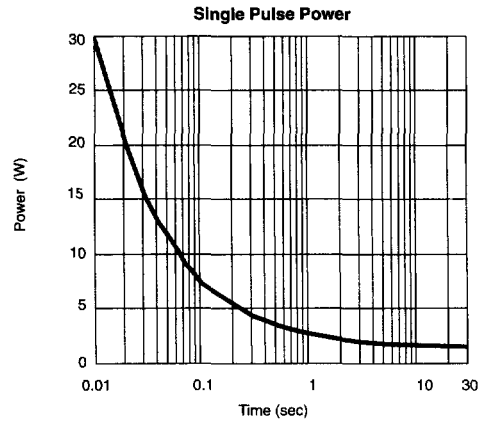
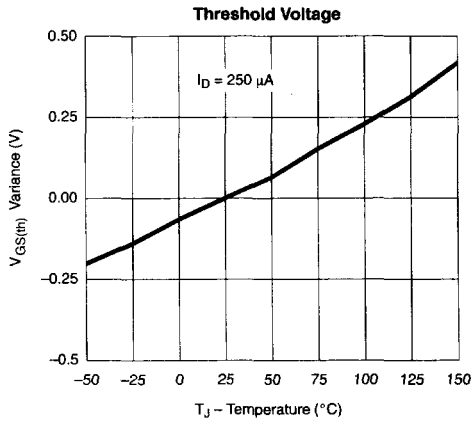
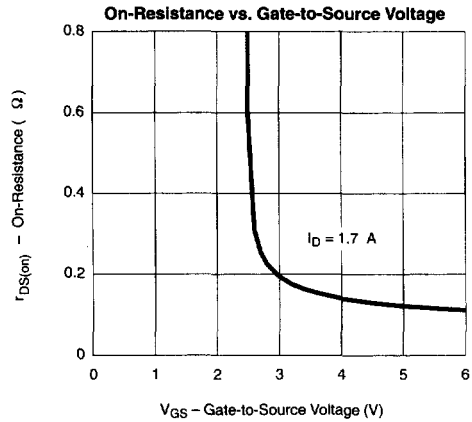
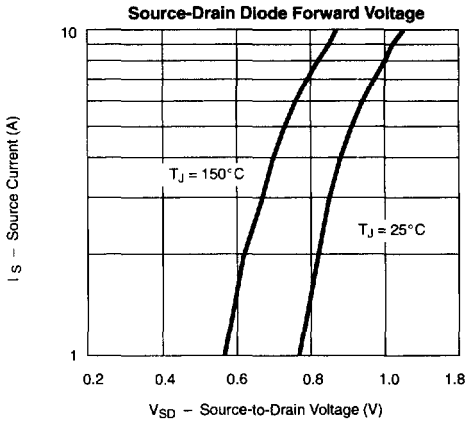
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**MOSFET**





**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) MOSFET**





**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

**SCHOTTKY**

