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

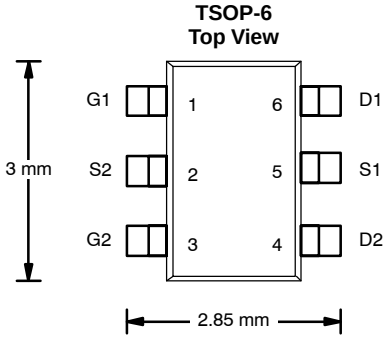
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
−12	0.140 @ V_{GS} = −4.5 V	−2.2
	0.200 @ V_{GS} = −2.5 V	−1.8
	0.300 @ V_{GS} = −1.8 V	−0.7

FEATURES

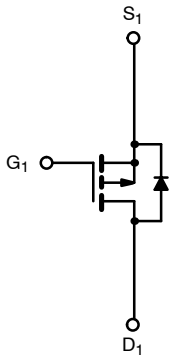
- TrenchFET® Power MOSFET

APPLICATIONS

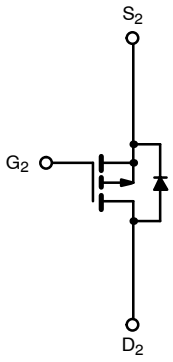
- Portable
  - PA Switch
  - Load Switch



Ordering Information: Si3971DV-T1—E3
Marking Code: MAxxx



P-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	5 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	−2.2	−1.9	A
	T_A = 70°C		−1.7	−1.5	
Pulsed Drain Current		I_{DM}	−8		
Continuous Source Current (Diode Conduction)[a]		I_S	−1.0	−0.72	
Maximum Power Dissipation[a]	T_A = 25°C	P_D	1.08	0.80	W
	T_A = 70°C		0.69	0.51	
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 ≤ 5 sec	R_{thJA}	97	115	°C/W
	Steady State		132	155	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	78	95	

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

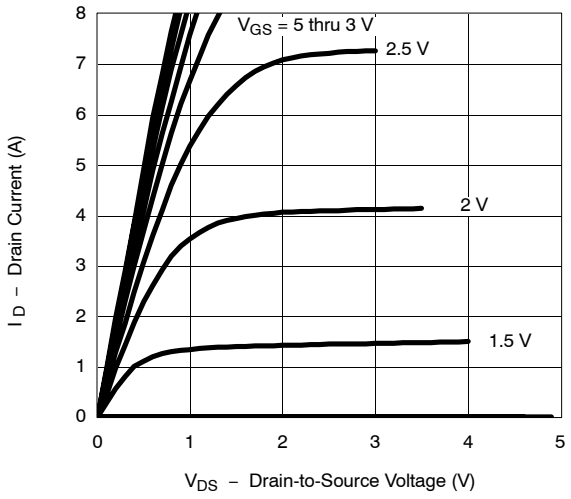
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = −250 μA	−0.40		−0.9	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 = 55°C			−5	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≤ −5 V, V_{GS} = −4.5 V	−5			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = −4.5 V, I_D = −2.2 A		0.110	0.140	Ω
		V_{GS} = −2.5 V, I_D = −1.8 A		0.160	0.200	
		V_{GS} = −1.8 V, I_D = −0.7 A		0.240	0.300	
Forward Transconductance[a]	g_{fs}	V_{DS} = −4.5 V, I_D = −2.2 A		5		S
Diode Forward Voltage[a]	V_{SD}	I_S = −1.0 A, V_{GS} = 0 V		−0.75	−1.1	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = −6 V, V_{GS} = −4.5 V, I_D = −2.2 A		3.4	5	nC
Gate-Source Charge	Q_{gs}			0.5		
Gate-Drain Charge	Q_{gd}			0.85		
Gate Resistance	R_g			7.6		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		28	45	ns
Rise Time	t_r			55	85	
Turn-Off Delay Time	$t_{d(off)}$			40	60	
Fall Time	t_f			30	50	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = −1.0 A, di/dt = 100 A/μs		25	45	

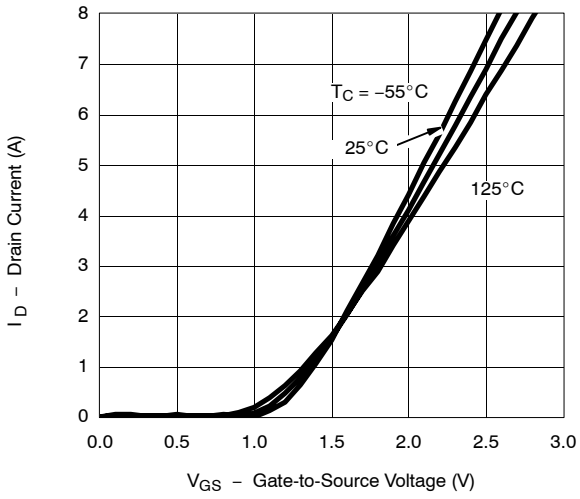
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Output Characteristics

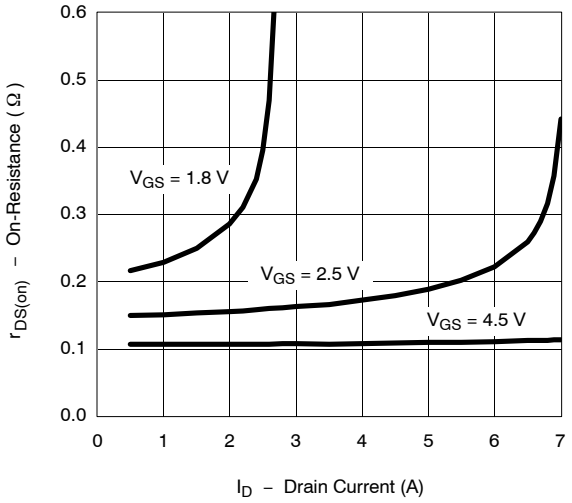


Transfer Characteristics

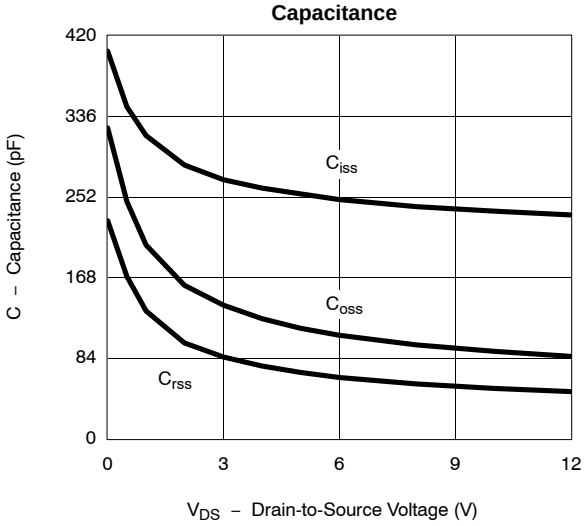


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

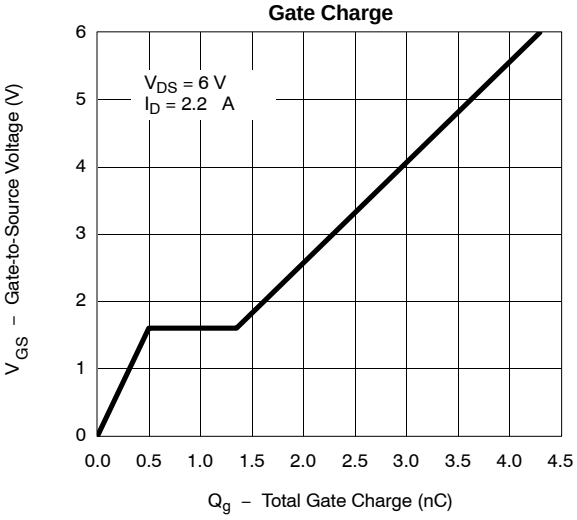
On-Resistance vs. Drain Current



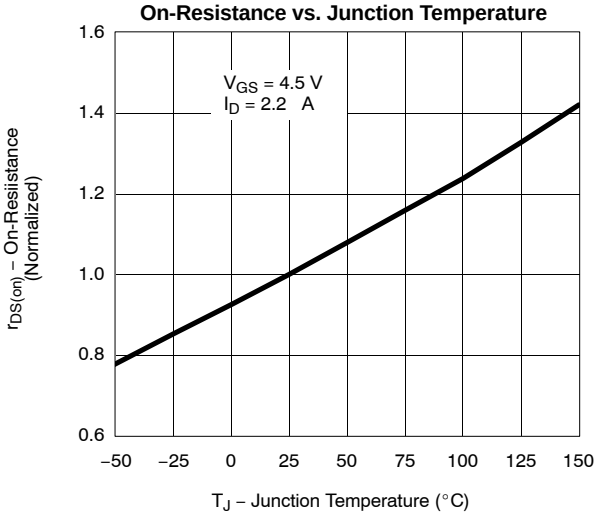
Capacitance



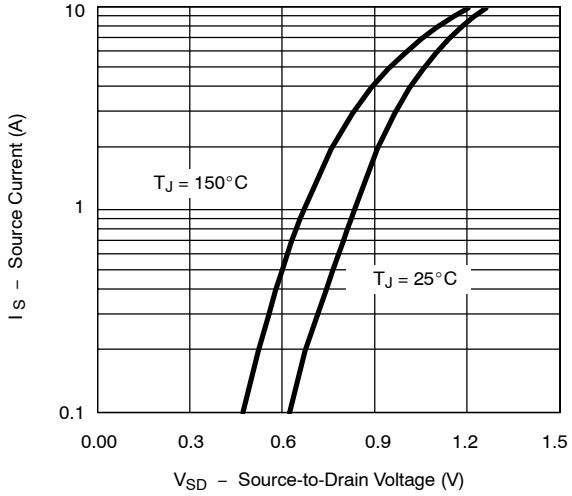
Gate Charge



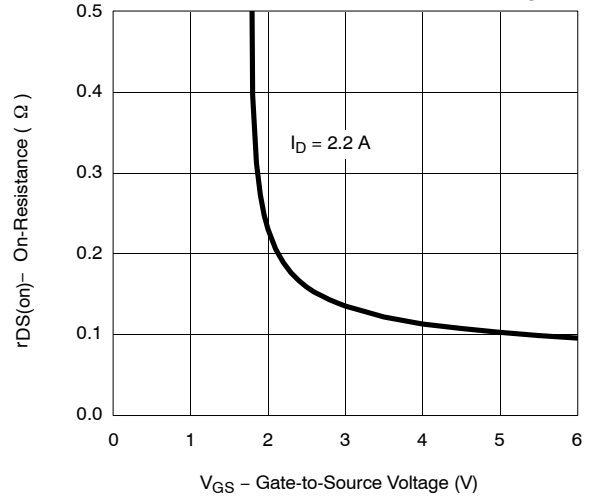
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

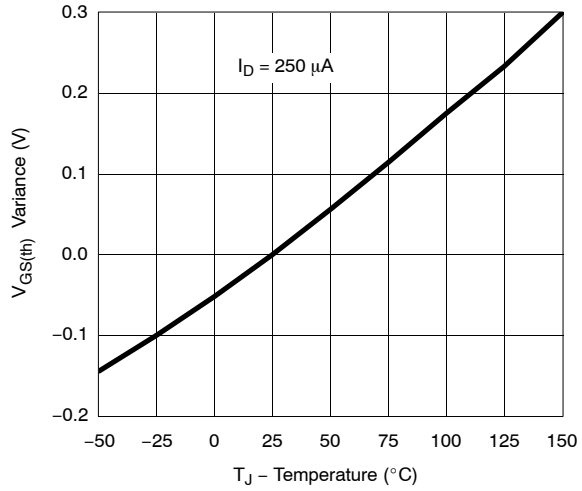


On-Resistance vs. Gate-to-Source Voltage

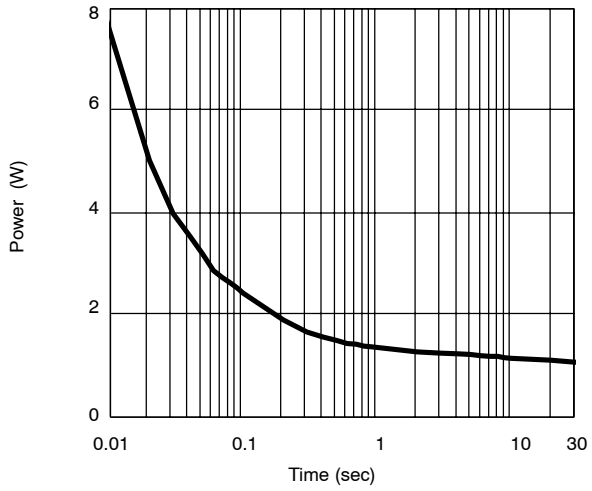


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

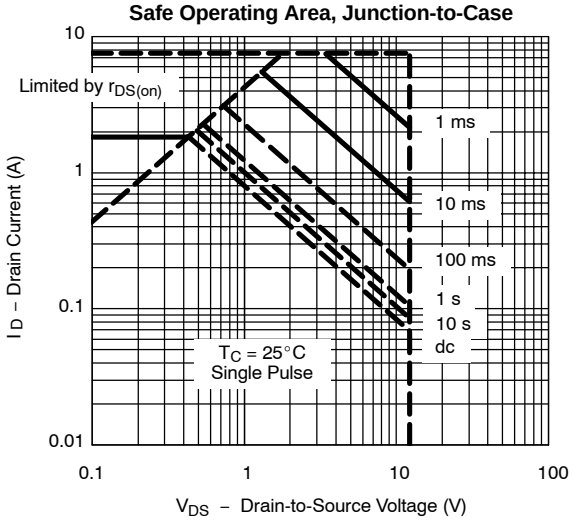
Threshold Voltage



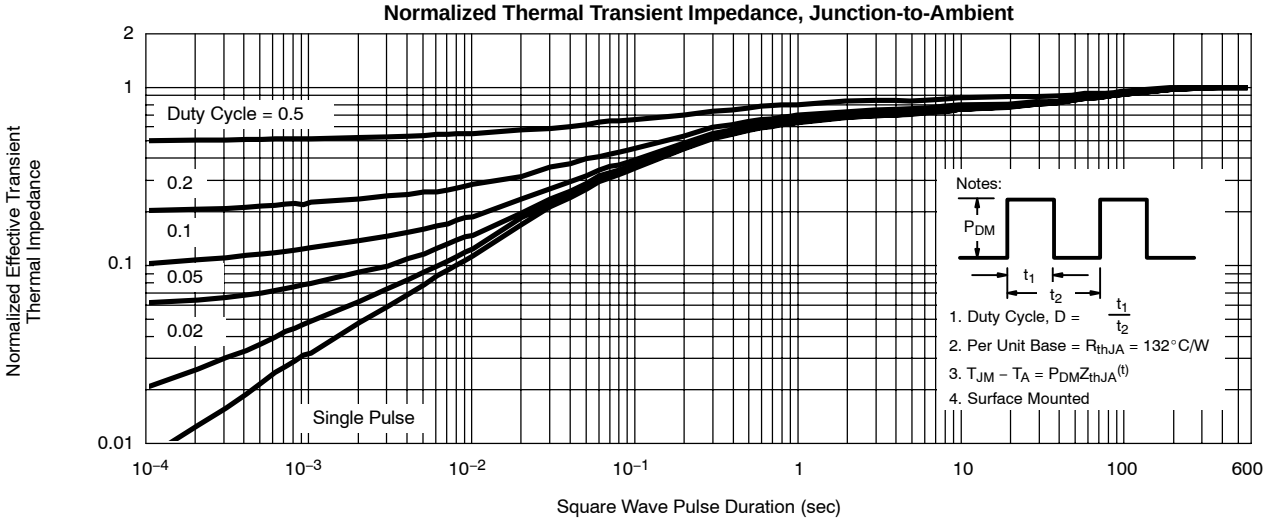
Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)