

P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY

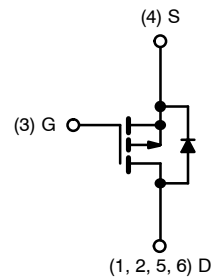
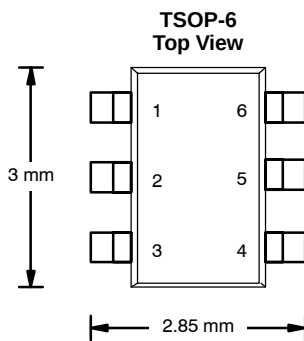
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
-20	0.027 @ $V_{GS} = -4.5$ V	-7	21
	0.035 @ $V_{GS} = -2.5$ V	-6.2	
	0.048 @ $V_{GS} = -1.8$ V	-5.2	

FEATURES

- TrenchFET® Power MOSFET: 1.8-V Rated
- Ultra-Low On-Resistance

APPLICATIONS

- Load Switch
- PA Switch
- Battery Switch



P-Channel MOSFET

Ordering Information: Si3493DV-T1
Si3493DV-T1—E3 (Lead (Pb)-Free)
Marking Code: 93xxx

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	5 secs	Steady State	Unit
Drain-Source Voltage		V _{DS}	−20		V
Gate-Source Voltage		V _{GS}	± 8		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	−7	−5.3	A
	T _A = 85°C		−3.6	−3.9	
Pulsed Drain Current		I _{DM}	−20		
Continuous Diode Current (Diode Conduction) ^a		I _S	−1.7	−0.9	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	2.0	1.1	W
	T _A = 85°C		1.0	0.6	
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	$t \leq 5$ sec	R_{thJA}	45	62.5	$^\circ\text{C/W}$
	Steady State		90	110	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	25	30	

Notes

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

SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-0.40		-1	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}, V_{GS} = \pm 8\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20\ \text{V}, V_{GS} = 0\ \text{V}$			-1	μA
		$V_{DS} = -20\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 85^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\ \text{V}, V_{GS} = -4.5\ \text{V}$	-20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5\ \text{V}, I_D = -7\ \text{A}$		0.022	0.027	Ω
		$V_{GS} = -2.5\ \text{V}, I_D = -6.2\ \text{A}$		0.029	0.035	
		$V_{GS} = -1.8\ \text{V}, I_D = -3\ \text{A}$		0.039	0.048	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\ \text{V}, I_D = -7\ \text{A}$		25		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.7\ \text{A}, V_{GS} = 0\ \text{V}$		-0.7	-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -10\ \text{V}, V_{GS} = -4.5\ \text{V}, I_D = -7\ \text{A}$		21	32	nC
Gate-Source Charge	Q_{gs}			2.6		
Gate-Drain Charge	Q_{gd}			6		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10\ \text{V}, R_L = 10\ \Omega$ $I_D \cong -1\ \text{A}, V_{GEN} = -4.5\ \text{V}, R_g = 6\ \Omega$		20	30	ns
Rise Time	t_r			40	60	
Turn-Off Delay Time	$t_{d(off)}$			125	190	
Fall Time	t_f			85	130	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.7\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		64	90	

Notes

- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)