HALOGEN

FREE



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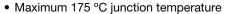
P-Channel 100 V (D-S) 175 °C MOSFET

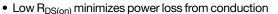


PRODUCT SUMMARY				
V _{DS} (V)	-100			
$R_{DS(on)}$ max. (Ω) at V_{GS} = -10 V	0.0101			
$R_{DS(on)}$ max. (Ω) at V_{GS} = -4.5 V	0.0150			
Q _g typ. (nC)	125			
I _D (A)	-120			
Configuration	Single			

FEATURES

- TrenchFET® power MOSFET
- Package with low thermal resistance

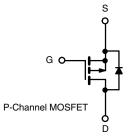




- · Compatible with logic-level gate driving
- 100 % Rq and UIS tested
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

APPLICATIONS

- Battery protection
- Motor drive control
- · Load switch



ORDERING INFORMATION	
Package	TO-220AB
Lead (Pb)-free and halogen-free	SUP70101EL-GE3

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$	°C, unless otherw	rise noted)			
PARAMETER		SYMBOL	LIMIT	UNIT	
Drain-source voltage		V_{DS}	-100	V	
Gate-source voltage		V_{GS}	± 20		
Continuous drain current ^d	T _C = 25 °C	- I _D	-120		
$(T_J = 175 ^{\circ}C)$	T _C = 125 °C		-78		
Pulsed drain current (100 μs)		I _{DM}	-240	_ A	
Avalanche current	L = 0.1 mH	I _{AS}	-75		
Single pulse avalanche energy ^a	L = 0.1 MH	E _{AS}	281	mJ	
Power dissipation	T _C = 25 °C °	Pn	375	W	
	T _C = 125 °C b	r _D	125		
Operating junction and storage temperature range		T _J , T _{stg}	-55 to +175	°C	

THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	TYPICAL	UNIT	
Junction-to-ambient	PCB mount b	R_{thJA}	40	°C/W	
Junction-to-case		R_{thJC}	0.4	C/VV	

Notes

- a. Duty cycle ≤ 1 %
- b. When mounted on 1" square PCB (FR4 material)
- c. See SOA curve for voltage derating
- d. Limited by package



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PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = -250 \mu\text{A}$	-100	-	-	V
Gate threshold voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	-1.5	-	-2.5	
Gate-body leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$	-	-	± 100	nA
Zero gate voltage drain current		V _{DS} = -100 V, V _{GS} = 0 V	-	-	-1	
	I _{DSS}	V _{DS} = -100 V, V _{GS} = 0 V, T _J = 125 °C	-	-	-50	μΑ
		V _{DS} = -100 V, V _{GS} = 0 V, T _J = 175 °C	1	-	-250	
On-state drain current ^a	I _{D(on)}	$V_{DS} \le -5 \text{ V}, V_{GS} = -10 \text{ V}$	-120	-	-	Α
Duning and the second of the s	В	V _{GS} = -10 V, I _D = -30 A	-	0.0081	0.0101	Ω
Drain-source on-state resistance a	R _{DS(on)}	$V_{GS} = -4.5 \text{ V}, I_D = -20 \text{ A}$	-	0.0114	0.0150	
Forward transconductance ^a	9 _{fs}	V _{DS} = -15 V, I _D = -25 A	-	60	-	S
Dynamic ^b						
Input capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = -50 V, f = 1 MHz	-	7000	-	pF
Output capacitance	C _{oss}		-	2180	-	
Reverse transfer capacitance	C _{rss}		-	170	-	
Total gate charge ^c	Qg		-	125	190	nC
Gate-source charge ^c	Q _{gs}	$V_{DS} = -50 \text{ V}, V_{GS} = -10 \text{ V}, I_{D} = -110 \text{ A}$	-	29	-	
Gate-drain charge ^c	Q_{gd}		-	30	-	
Gate resistance	Rg	f = 1 MHz	1.3	6.5	13	Ω
Turn-on delay time ^c	t _{d(on)}		-	20	30	
Rise time ^c	t _r	$V_{DD} = -50 \text{ V}, R_1 = 0.71 \Omega$	-	40	60	
Turn-off delay time ^c	t _{d(off)}	$I_D \cong -70$ A, $V_{GEN} = -10$ V, $R_g = 1$ Ω	-	110	200	ns
Fall time ^c	t _f		-	40	60	
Drain-Source Body Diode Characte	ristics (T _C = 25	5 °C b)				
Continuous current	I _S		-	-	-110	۸
Pulsed current	I _{SM}		-	-	-240	Α
Forward voltage ^a	V _{SD}	I _F = -85 A, V _{GS} = 0 V	-	-1	-1.5	V
Reverse recovery time	t _{rr}	I _F = -85 A, dl/dt = 100 A/μs	-	110	170	ns
Peak reverse recovery charge	I _{RM(REC)}		-	-7	-11	Α
Reverse recovery charge	Q _{rr}		-	0.38	0.57	μC

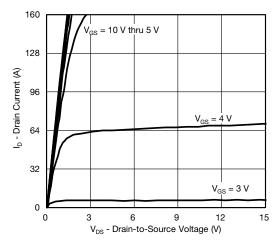
Notes

- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%$
- b. Guaranteed by design, not subject to production testing
- c. Independent of operating temperature

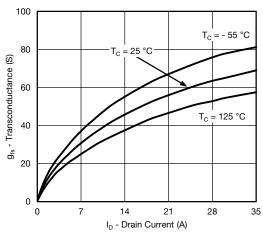
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



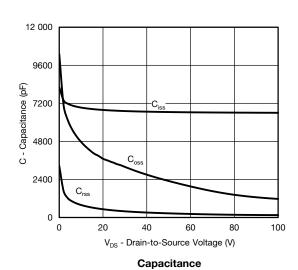
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

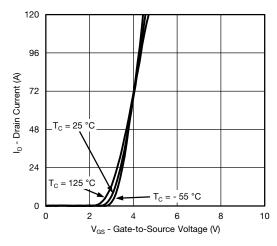


Output Characteristics

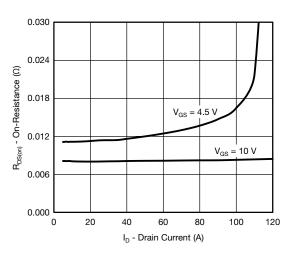


Transconductance

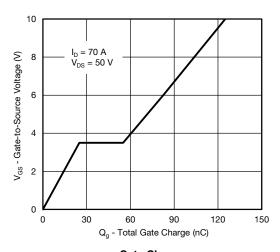




Transfer Characteristics

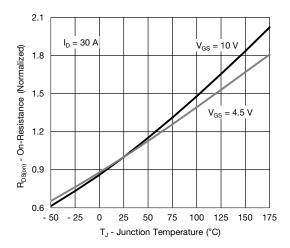


On-Resistance vs. Drain Current

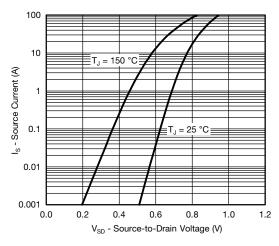




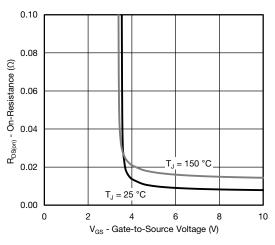
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



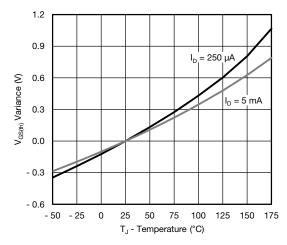
On-Resistance vs. Junction Temperature



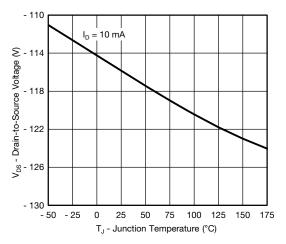
Source Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



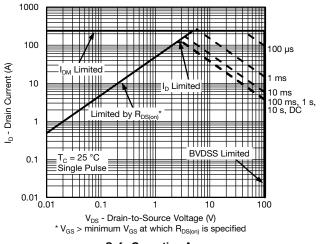
Threshold Voltage



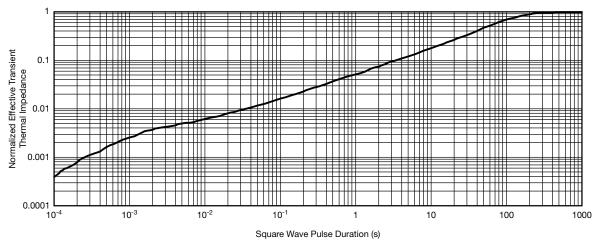
Drain Source Breakdown vs. Junction Temperature



THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)



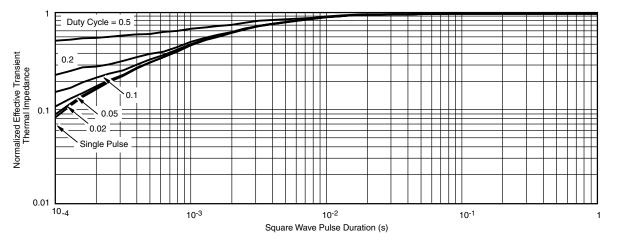
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction to Ambient (25 °C)
 - Normalized Transient Thermal Impedance Junction to Case (25 °C) are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part

pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

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