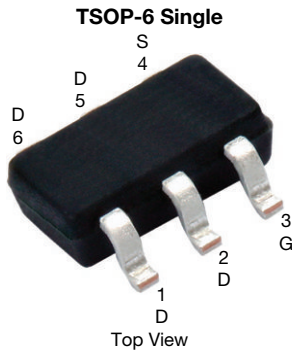


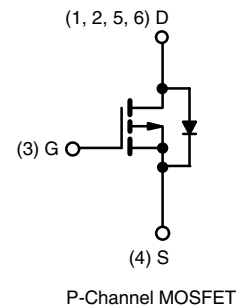
Automotive P-Channel 60 V (D-S) 175 °C MOSFET



FEATURES

- TrenchFET® power MOSFET
- AEC-Q101 qualified
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT
HALOGEN
FREE


PRODUCT SUMMARY	
V _{DS} (V)	-60
R _{DS(on)} (Ω) at V _{GS} = -10 V	0.095
R _{DS(on)} (Ω) at V _{GS} = -4.5 V	0.135
I _D (A)	-5.3
Configuration	Single

Marking Code: 9Q

ORDERING INFORMATION	
Package	TSOP-6
Lead (Pb)-free and halogen-free	SQ3427CEV (for detailed order number please see www.vishay.com/doc?79771)

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)					
PARAMETER	SYMBOL	LIMIT	UNIT		
Drain-Source Voltage	V _{DS}	-60	V		
Gate-Source Voltage	V _{GS}	± 20			
Continuous Drain Current	I _D	T _C = 25 °C	-5.3	A	
		T _C = 125 °C	-3		
Continuous Source Current (Diode Conduction)	I _S	-6.3			
Pulsed Drain Current ^a	I _{DM}	-21			
Single Pulse Avalanche Current	I _{AS}	-21			
Single Pulse Avalanche Energy	E _{AS}	22	mJ		
Maximum Power Dissipation	P _D	T _C = 25 °C	5	W	
		T _C = 125 °C	1.6		
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to +175	°C		

THERMAL RESISTANCE RATINGS				
PARAMETER	SYMBOL	LIMIT	UNIT	
Junction-to-Ambient	R _{thJA}	110	°C/W	
Junction-to-Foot (Drain)	R _{thJF}	30		

Notes

- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- When mounted on 1" square PCB (FR4 material).



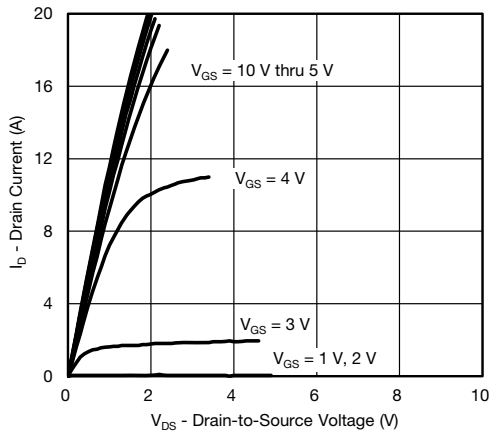
SPECIFICATIONS ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0, I_D = -250\text{ }\mu\text{A}$		-60	-	-	V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$		-1.5	-2	-2.5	
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$		-		± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}$	$V_{DS} = -60\text{ V}$	-	-	-1	μA
		$V_{GS} = 0\text{ V}$	$V_{DS} = -60\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	-	-50	
		$V_{GS} = 0\text{ V}$	$V_{DS} = -60\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	-	-150	
On-State Drain Current ^a	$I_{D(on)}$	$V_{GS} = -10\text{ V}$	$V_{DS} \leq -5\text{ V}$	-10	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}$	$I_D = -4.5\text{ A}$	-	0.079	0.095	Ω
		$V_{GS} = -10\text{ V}$	$I_D = -4.5\text{ A}, T_J = 125\text{ }^\circ\text{C}$	-	-	0.148	
		$V_{GS} = -10\text{ V}$	$I_D = -4.5\text{ A}, T_J = 175\text{ }^\circ\text{C}$	-	-	0.178	
		$V_{GS} = -4.5\text{ V}$	$I_D = -3.5\text{ A}$	-	0.112	0.135	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -4\text{ A}$		-	9	-	S
Dynamic ^b							
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}$	$V_{DS} = -30\text{ V}, f = 1\text{ MHz}$	-	726	1000	μF
Output Capacitance	C_{OSS}			-	91	120	
Reverse Transfer Capacitance	C_{RSS}			-	56	80	
Total Gate Charge ^c	Q_g	$V_{GS} = -10\text{ V}$	$V_{DS} = -30\text{ V}, I_D = -5\text{ A}$	-	16.9	22	nC
Gate-Source Charge ^c	Q_{gs}			-	2.9	-	
Gate-Drain Charge ^c	Q_{gd}			-	4.1	-	
Gate Resistance	R_g	f = 1 MHz		2.5	5	7.5	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 6\text{ }\Omega$ $I_D \cong -5\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		-	8	12	ns
Rise Time ^c	t_r			-	24	35	
Turn-Off Delay Time ^c	$t_{d(off)}$			-	25	38	
Fall Time ^c	t_f			-	33	50	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed Current ^a	I_{SM}			-	-	-21	A
Forward Voltage	V_{SD}	$I_F = -1.6\text{ A}, V_{GS} = 0\text{ V}$		-	-0.8	-1.2	V
Body diode reverse recovery time	t_{rr}	$I_F = -1.7\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		-	23	46	ns
Body diode reverse recovery charge	Q_{rr}			-	27	54	nC
Reverse recovery fall time	t_a			-	20	-	
Reverse recovery rise time	t_b			-	3	-	ns
Body diode peak reverse recovery current	$I_{RM(REC)}$			-	-2.86	-	A

Notes

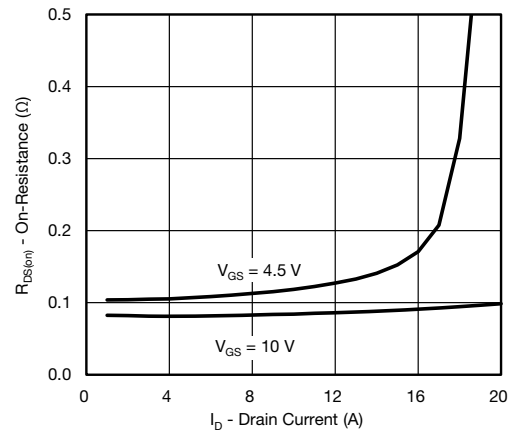
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

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.

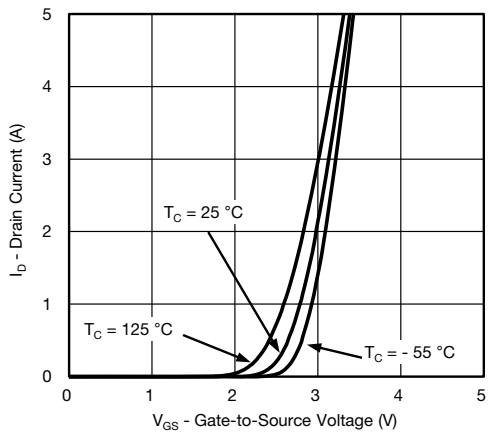
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



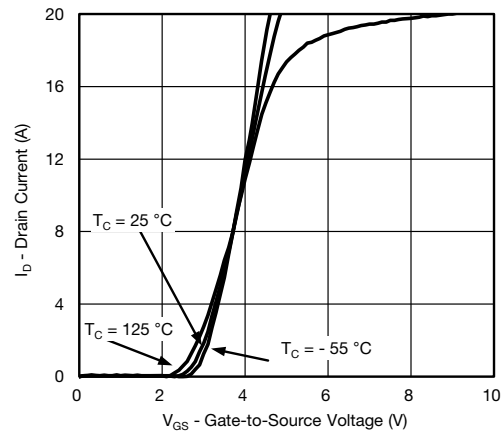
Output Characteristics



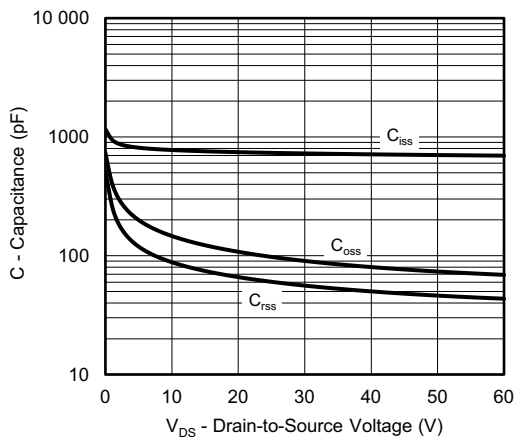
On-Resistance vs. Drain Current and Gate Voltage



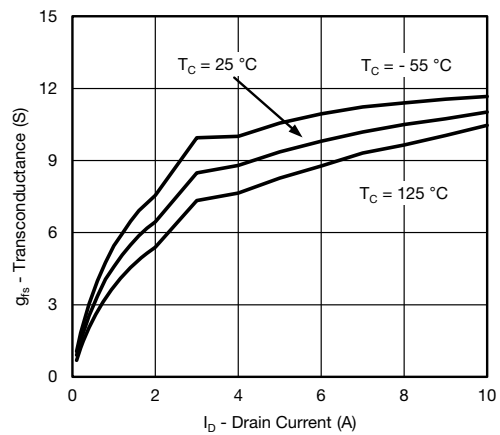
Transfer Characteristics



Transfer Characteristics



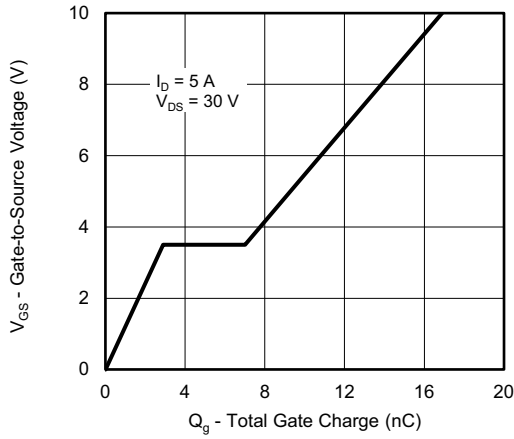
Capacitance



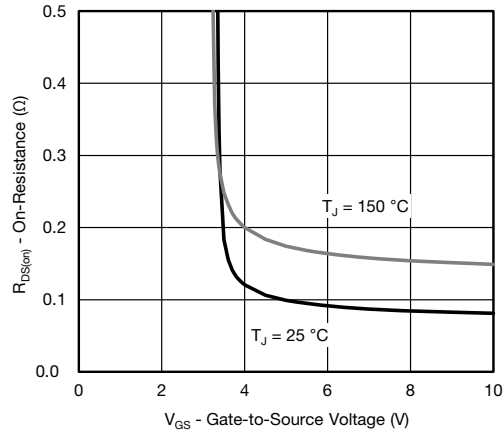
Transconductance



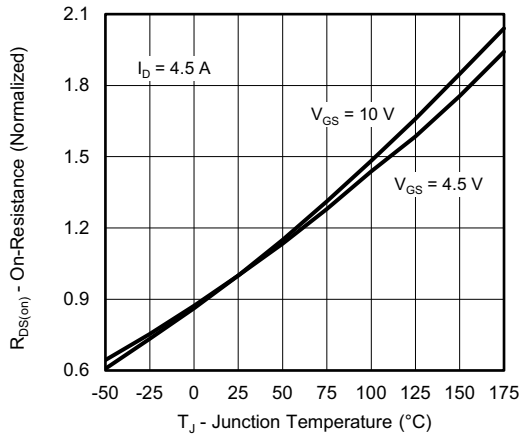
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



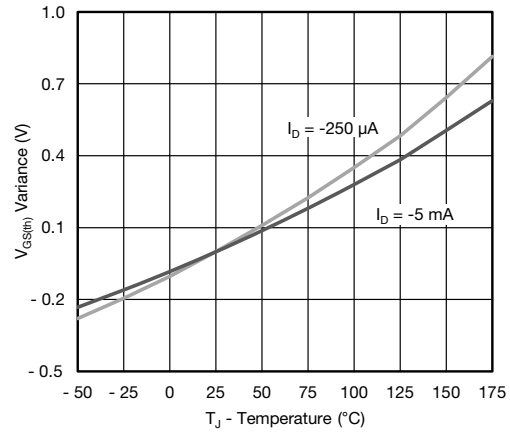
Gate Charge



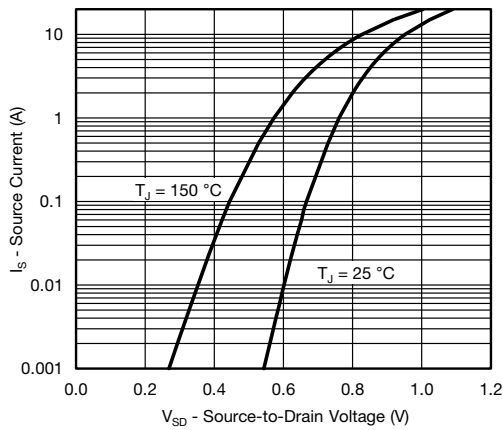
On-Resistance vs. Gate-to-Source Voltage



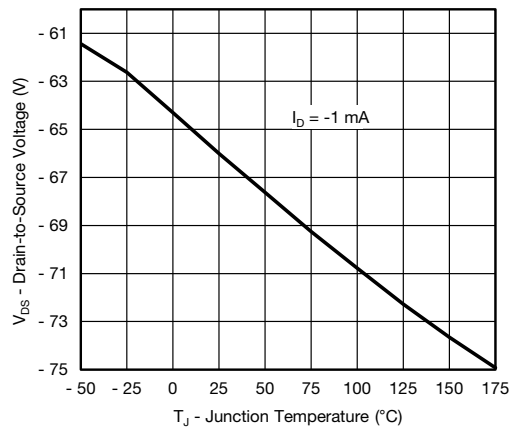
On-Resistance vs. Junction Temperature



Threshold Voltage



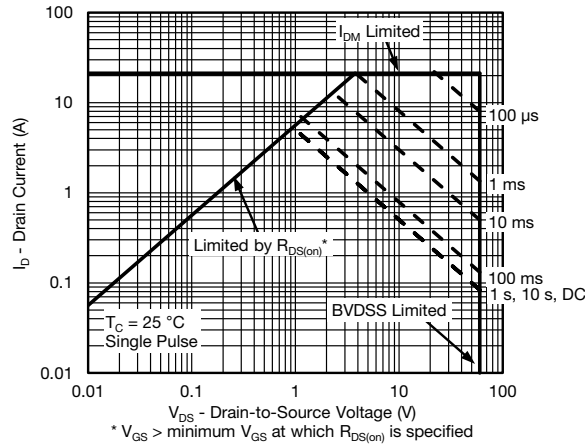
Source-Drain Diode Forward Voltage



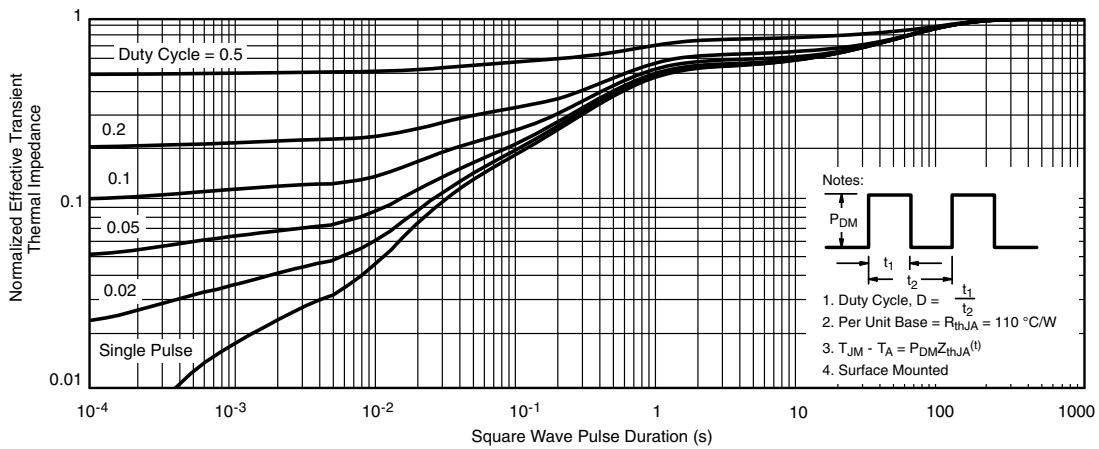
Drain-to-Source Voltage vs. Junction Temperature



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



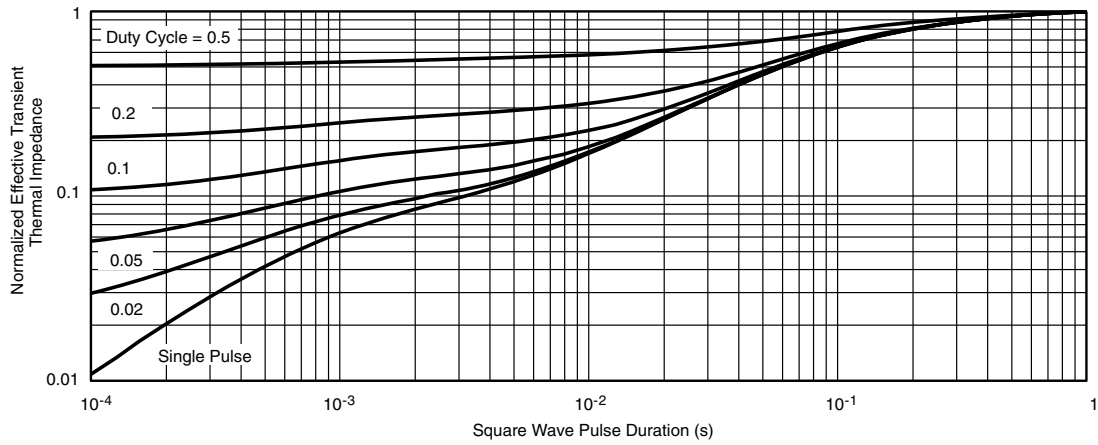
Safe Operating Area, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Foot

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