



Automotive N-Channel 55 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY	
V _{DS} (V)	55
R _{DS(on)} (Ω) at V _{GS} = 10 V	0.020
R _{DS(on)} (Ω) at V _{GS} = 4.5 V	0.026
I _D (A)	30
Configuration	Single

FEATURES

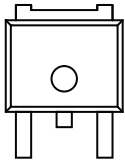
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- 100 % R_g and UIS Tested
- AEC-Q101 Qualified^d
- Compliant to RoHS Directive 2002/95/EC

AUTOMOTIVE GRADE



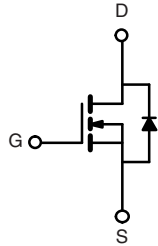
RoHS COMPLIANT HALOGEN FREE

TO-252



Top View

Drain Connected to Tab



N-Channel MOSFET

ORDERING INFORMATION	
Package	TO-252
Lead (Pb)-free and Halogen-free	SQD35N05-26L-GE3

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	55	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current	I _D	T _C = 25 °C ^a	30
		T _C = 125 °C	19
Continuous Source Current (Diode Conduction) ^a	I _S	30	A
Pulsed Drain Current ^b	I _{DM}	120	
Single Pulse Avalanche Energy	E _{AS}	20	
Single Pulse Avalanche Current	I _{AS}	20	mJ
	E _{AS}	20	
Maximum Power Dissipation ^b	P _D	T _C = 25 °C	50
		T _C = 125 °C	16
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}	60	°C/W
Junction-to-Case (Drain)	R _{thJC}	3	

Notes

- Package limited.
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- When mounted on 1" square PCB (FR-4 material).
- Parametric verification ongoing.



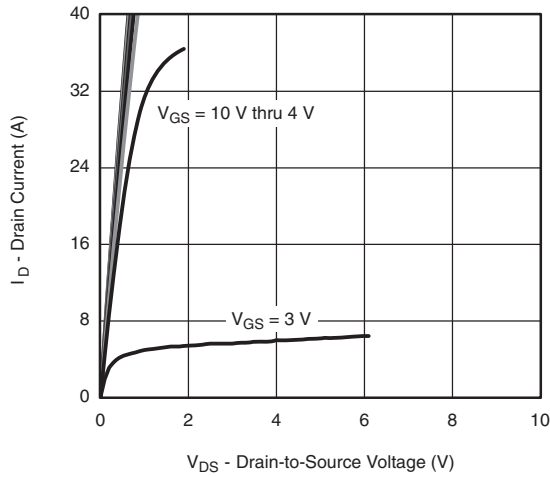
SPECIFICATIONS ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	55	-	-	V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	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}	$V_{GS} = 0\text{ V}$, $V_{DS} = 55\text{ V}$	-	-	1	μA
		$V_{GS} = 0\text{ V}$, $V_{DS} = 55\text{ V}$, $T_J = 125\text{ }^\circ\text{C}$	-	-	50	
		$V_{GS} = 0\text{ V}$, $V_{DS} = 55\text{ V}$, $T_J = 175\text{ }^\circ\text{C}$	-	-	250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{GS} = 5\text{ V}$, $V_{DS} \geq 5\text{ V}$	30	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$	-	0.016	0.020	Ω
		$V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$, $T_J = 125\text{ }^\circ\text{C}$	-	-	0.035	
		$V_{GS} = 10\text{ V}$, $I_D = 20\text{ A}$, $T_J = 175\text{ }^\circ\text{C}$	-	-	0.043	
		$V_{GS} = 4.5\text{ V}$, $I_D = 15\text{ A}$	-	0.021	0.026	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 20\text{ A}$	-	34	-	S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$	-	938	1175	μF
Output Capacitance	C_{oss}		-	203	255	
Reverse Transfer Capacitance	C_{rss}		-	86	110	
Total Gate Charge ^c	Q_g	$V_{GS} = 5\text{ V}$, $V_{DS} = 25\text{ V}$, $I_D = 35\text{ A}$	-	12	18	nC
Gate-Source Charge ^c	Q_{gs}		-	4.1	-	
Gate-Drain Charge ^c	Q_{gd}		-	4.8	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	1.3	2.6	4	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 25\text{ V}$, $R_L = 0.71\text{ }\Omega$ $I_D \cong 35\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_g = 1\text{ }\Omega$	-	7	11	ns
Rise Time ^c	t_r		-	10	15	
Turn-Off Delay Time ^c	$t_{d(off)}$		-	18	27	
Fall Time ^c	t_f		-	5	8	
Source-Drain Diode Ratings and Characteristics^b						
Pulsed Current ^a	I_{SM}		-	-	120	A
Forward Voltage	V_{SD}	$I_F = 80\text{ A}$, $V_{GS} = 0\text{ V}$	-	1.2	1.5	V

Notes

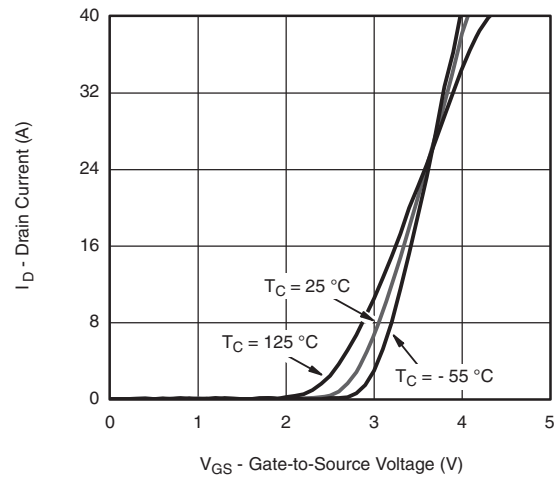
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

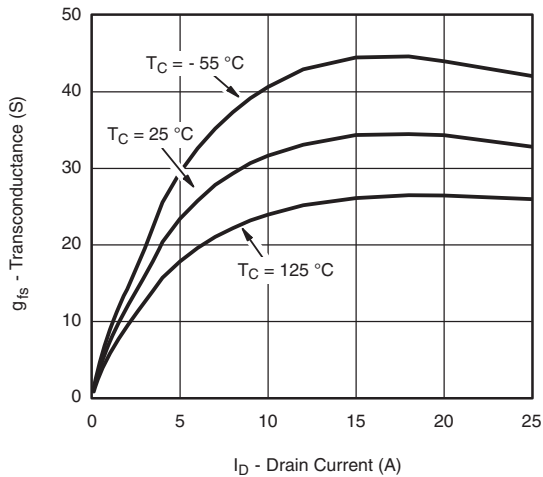
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



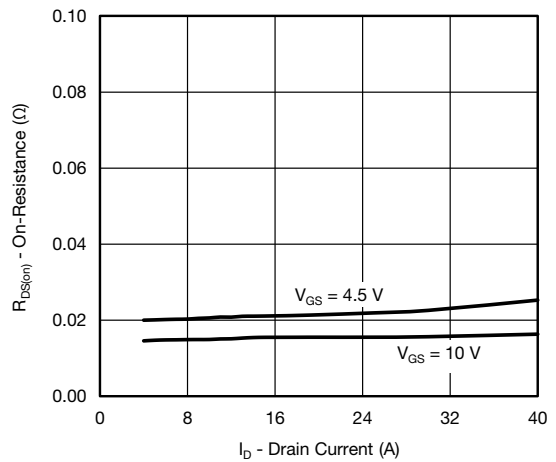
Output Characteristics



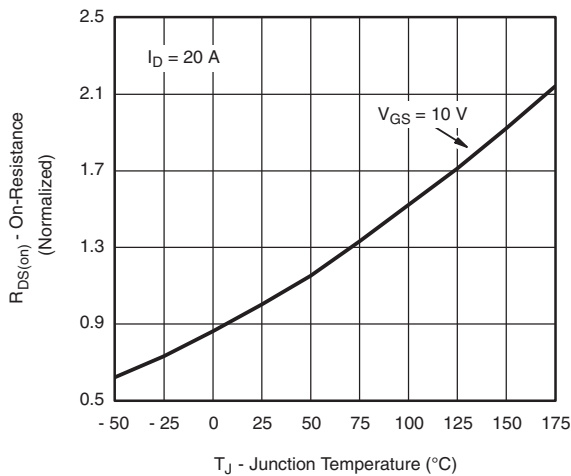
Transfer Characteristics



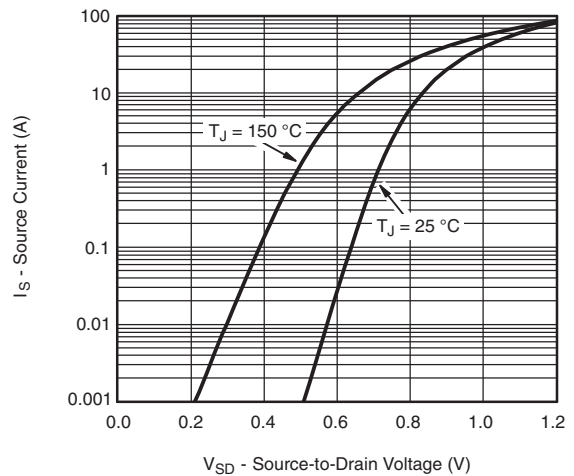
Transconductance



On-Resistance vs. Drain Current



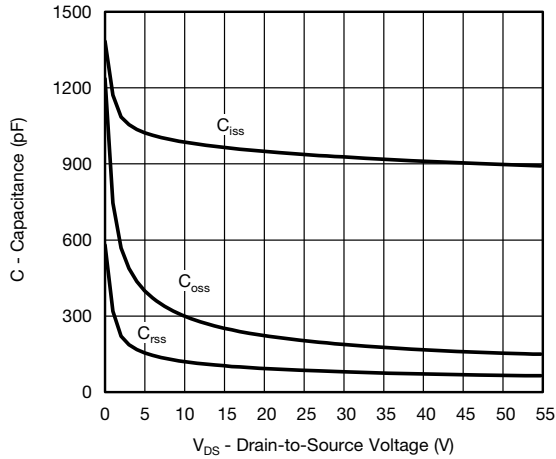
On-Resistance vs. Junction Temperature



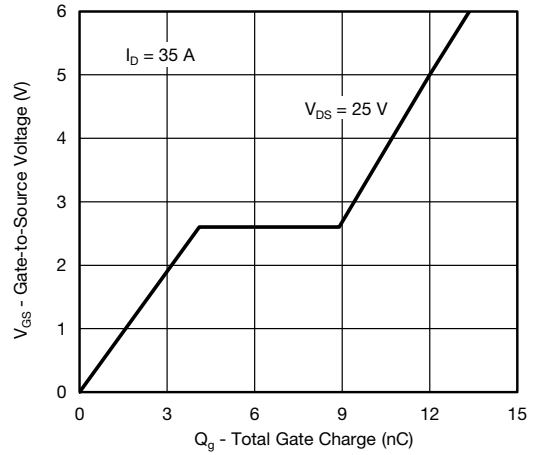
Source Drain Diode Forward Voltage



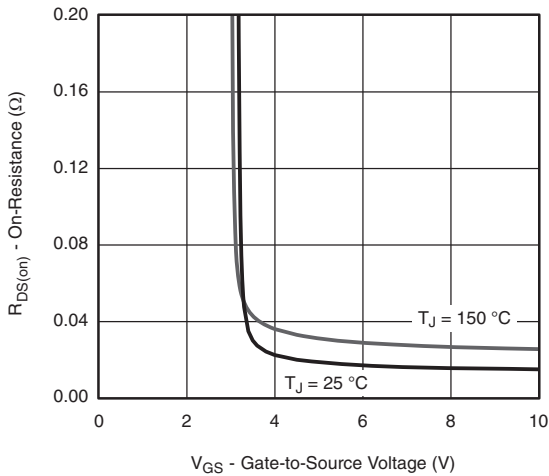
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



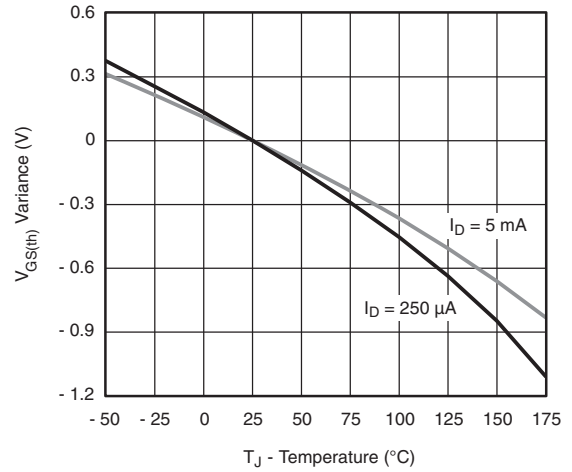
Capacitance



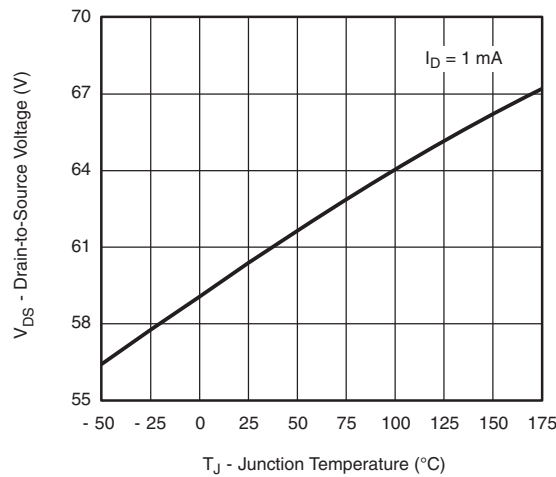
Gate Charge



On-Resistance vs. Gate-to-Source Voltage



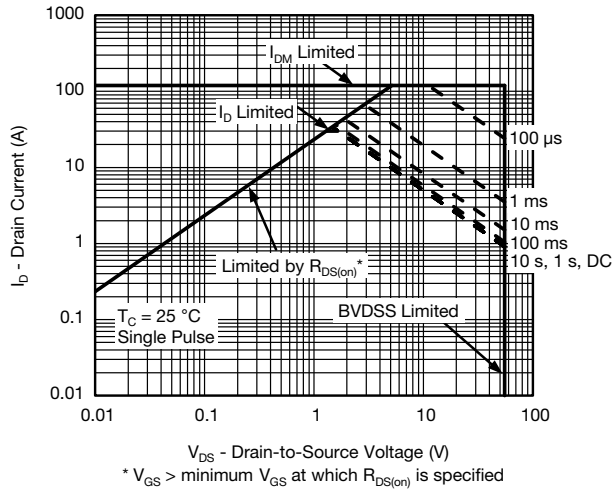
Threshold Voltage



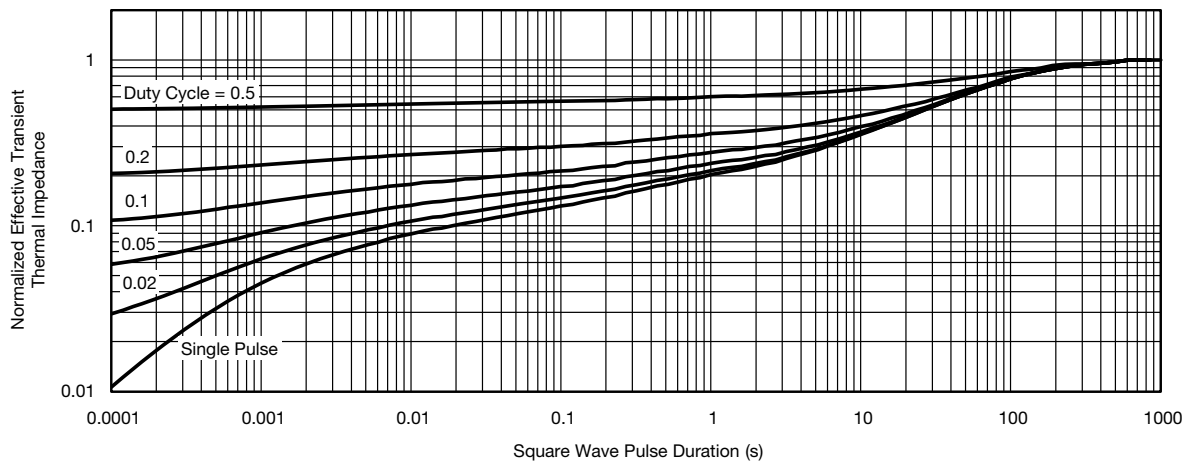
Drain Source Breakdown vs. Junction Temperature



THERMAL RATINGS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



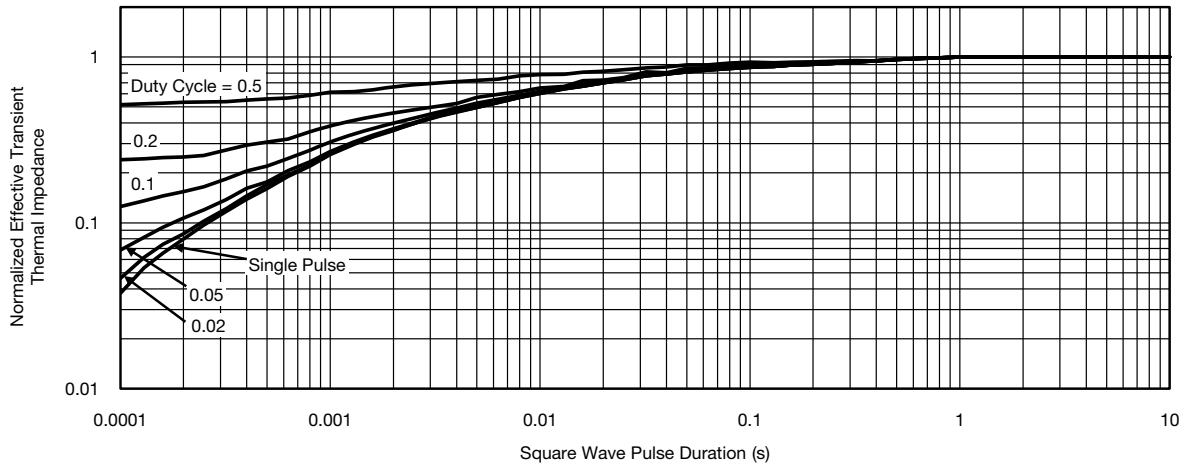
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



THERMAL RATINGS ($T_A = 25\text{ }^\circ\text{C}$, 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 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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