

Automotive N-Channel 40 V (D-S) 175 °C MOSFET

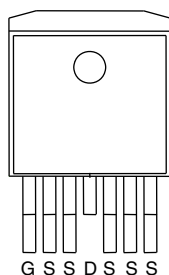


PRODUCT SUMMARY

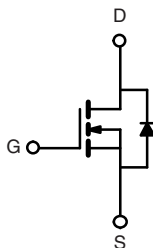
V_{DS} (V)	40
$R_{DS(on)}$ (Ω) at $V_{GS} = 10$ V	0.0011
$R_{DS(on)}$ (Ω) at $V_{GS} = 4.5$ V	0.0013
I_D (A)	200
Configuration	Single

FEATURES

- TrenchFET® Power MOSFET
- Package with Low Thermal Resistance
- 100 % R_g and UIS Tested
- AEC-Q101 Qualified^d
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912

TO-263-7L


Drain connected to Tab



N-Channel MOSFET

ORDERING INFORMATION

Package	TO-263-7L
Lead (Pb)-free and Halogen-free	SQM200N04-1m1L-GE3

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ^a	I_D	200	A
	$T_C = 125$ °C	200	
Continuous Source Current (Diode Conduction) ^a	I_S	200	
Pulsed Drain Current ^b	I_{DM}	600	
Single Pulse Avalanche Current	I_{AS}	100	
Single Pulse Avalanche Energy	E_{AS}	500	mJ
	$L = 0.1$ mH		
Maximum Power Dissipation ^b	P_D	375	W
	$T_C = 125$ °C	125	
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}	40	°C/W
Junction-to-Case (Drain)	R_{thJC}	0.4	

Notes

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

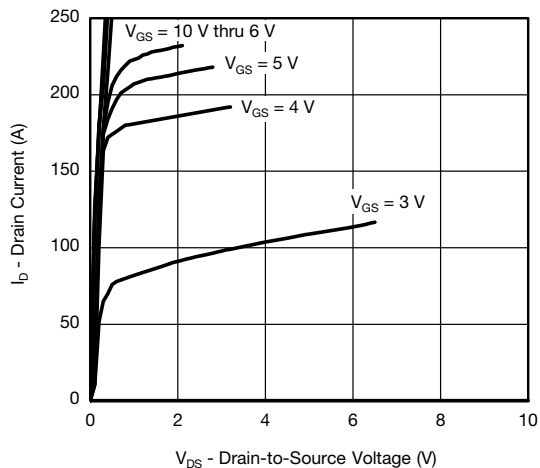
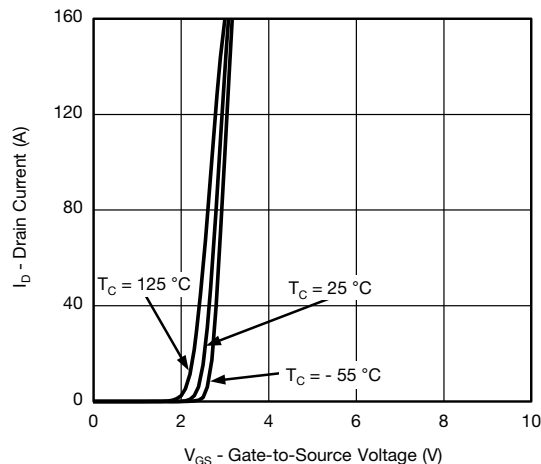
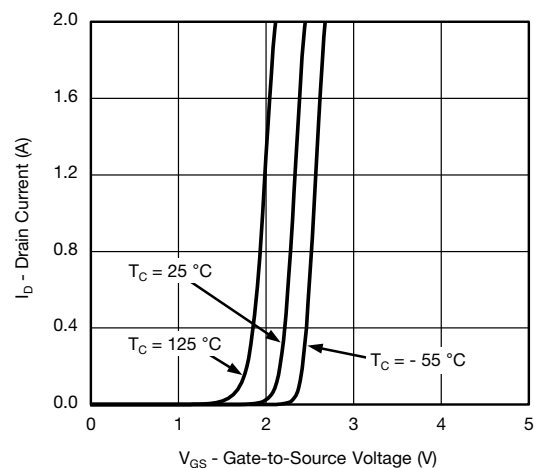
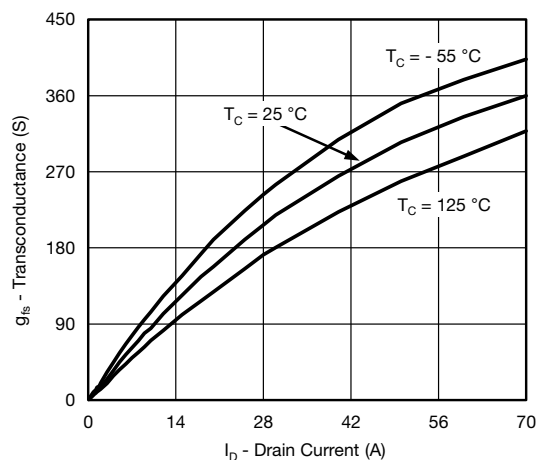
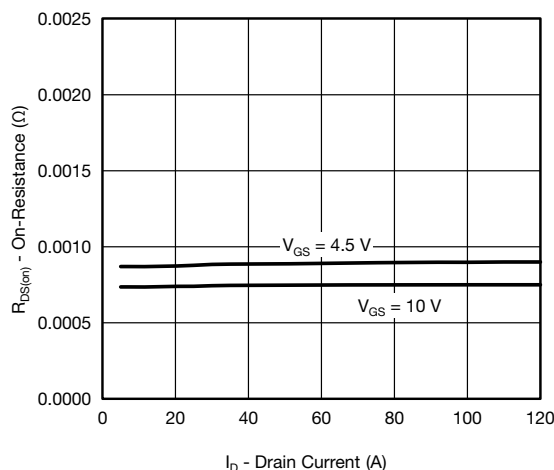
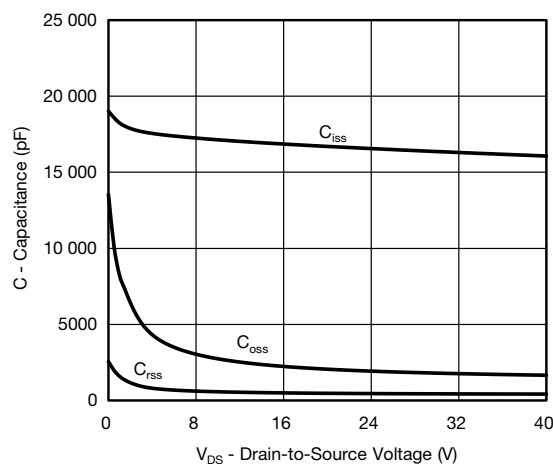


SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA		40	-	-	V
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		1.5	2.0	2.5	
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V	V _{DS} = 40 V	-	-	1	μA
		V _{GS} = 0 V	V _{DS} = 40 V, T _J = 125 °C	-	-	50	
		V _{GS} = 0 V	V _{DS} = 40 V, T _J = 175 °C	-	-	500	
On-State Drain Current ^a	I _{D(on)}	V _{GS} = 10 V	V _{DS} ≥ 5 V	200	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V	I _D = 30 A	-	0.0008	0.0011	Ω
		V _{GS} = 10 V	I _D = 30 A, T _J = 125 °C	-	-	0.0019	
		V _{GS} = 10 V	I _D = 30 A, T _J = 175 °C	-	-	0.0023	
		V _{GS} = 4.5 V	I _D = 20 A	-	0.0009	0.0013	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 30 A		-	219	-	S
Dynamic ^b							
Input Capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = 25 V, f = 1 MHz	-	16 524	20 655	pF
Output Capacitance	C _{oss}			-	2060	2575	
Reverse Transfer Capacitance	C _{rss}			-	484	605	
Total Gate Charge ^c	Q _g	V _{GS} = 10 V	V _{DS} = 20 V, I _D = 20 A	-	275	413	nC
Gate-Source Charge ^c	Q _{gs}			-	56.6	-	
Gate-Drain Charge ^c	Q _{gd}			-	45.4	-	
Gate Resistance	R _g	f = 1 MHz		4.2	8.5	12.8	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 20 V, R _L = 1 Ω I _D ≥ 20 A, V _{GEN} = 10 V, R _g = 1 Ω		-	13	20	ns
Rise Time ^c	t _r			-	12	18	
Turn-Off Delay Time ^c	t _{d(off)}			-	443	665	
Fall Time ^c	t _f			-	126	189	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed Current ^a	I _{SM}			-	-	600	A
Forward Voltage	V _{SD}	I _F = 60 A, V _{GS} = 0 V		-	0.8	1.5	V

Notes

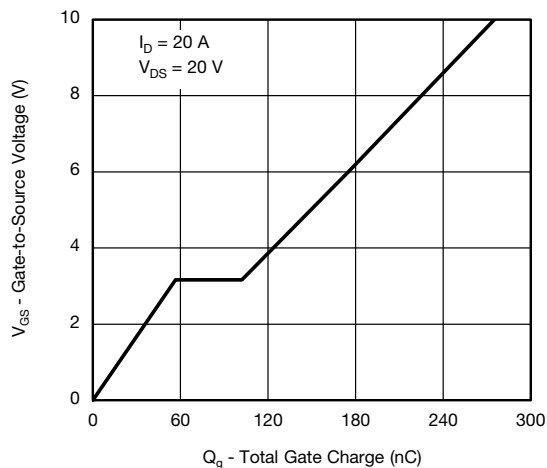
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

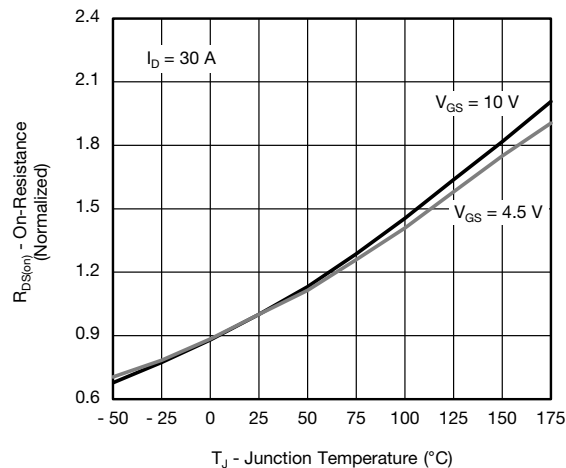
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

Output Characteristics

Transfer Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

Capacitance



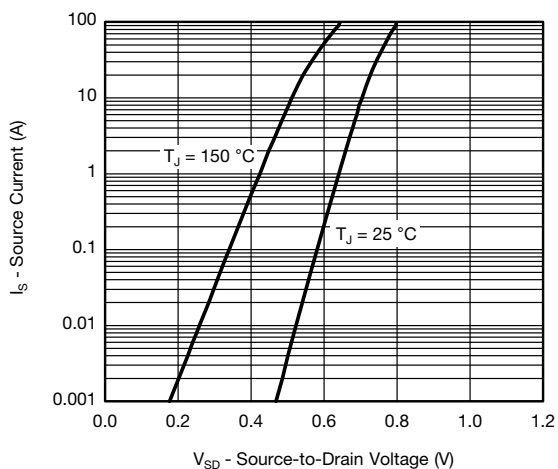
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



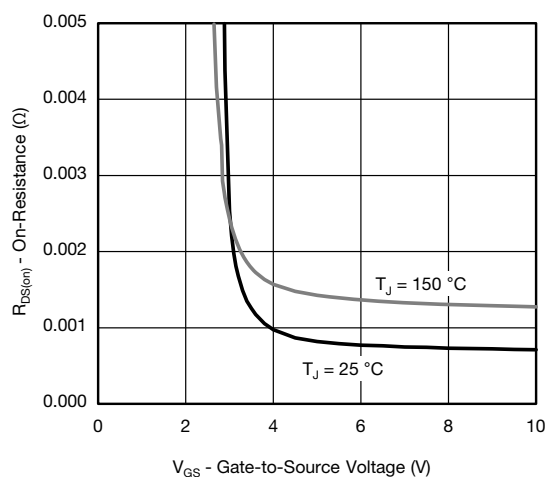
Gate Charge



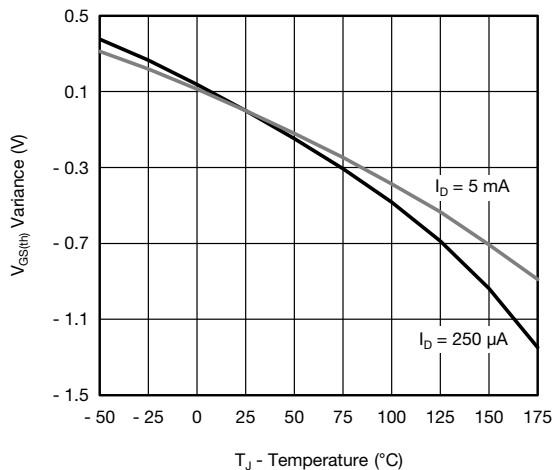
On-Resistance vs. Junction Temperature



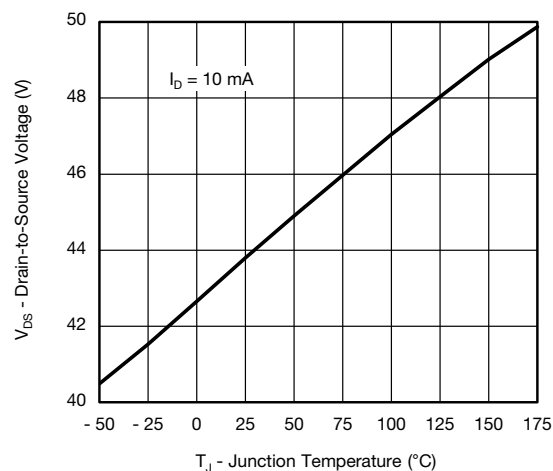
Source Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



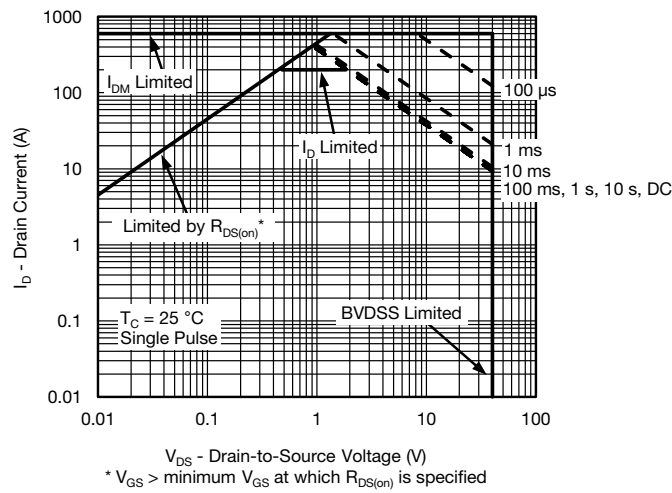
Threshold Voltage



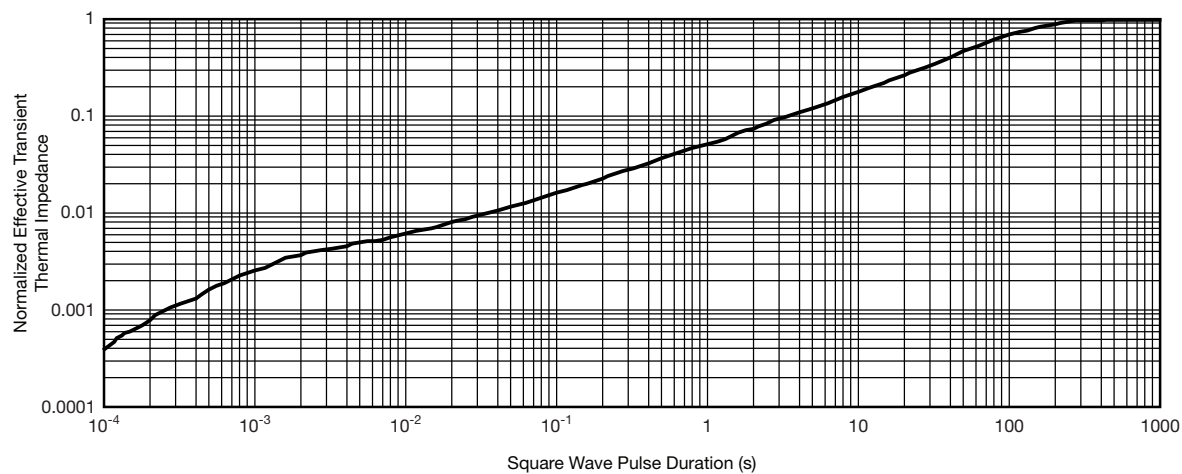
Drain Source Breakdown vs. Junction Temperature



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



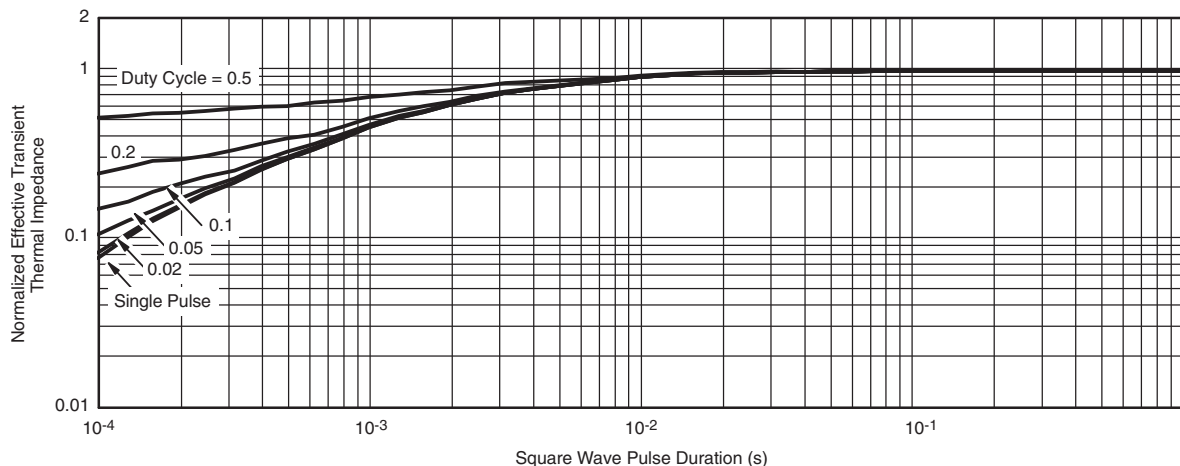
Safe Operating Area



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

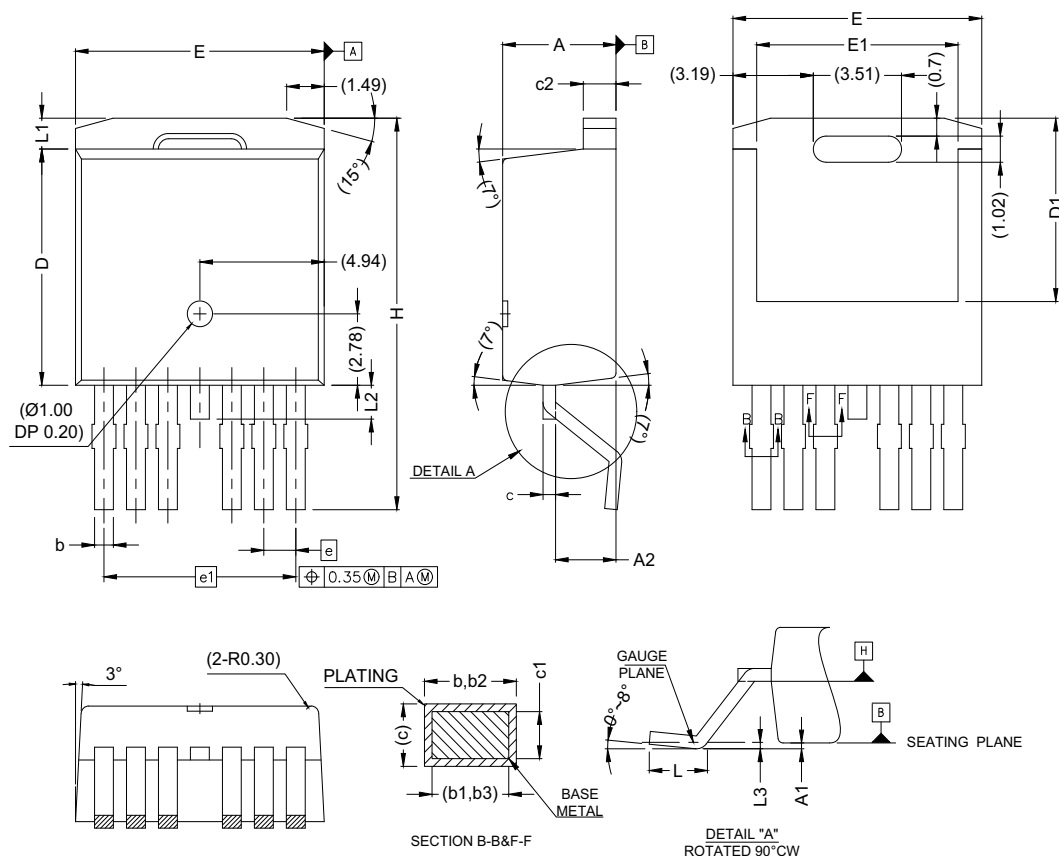
Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient ($25\text{ }^{\circ}\text{C}$)
 - Normalized Transient Thermal Impedance Junction-to-Case ($25\text{ }^{\circ}\text{C}$)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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FOR FACILITY CODE "N"

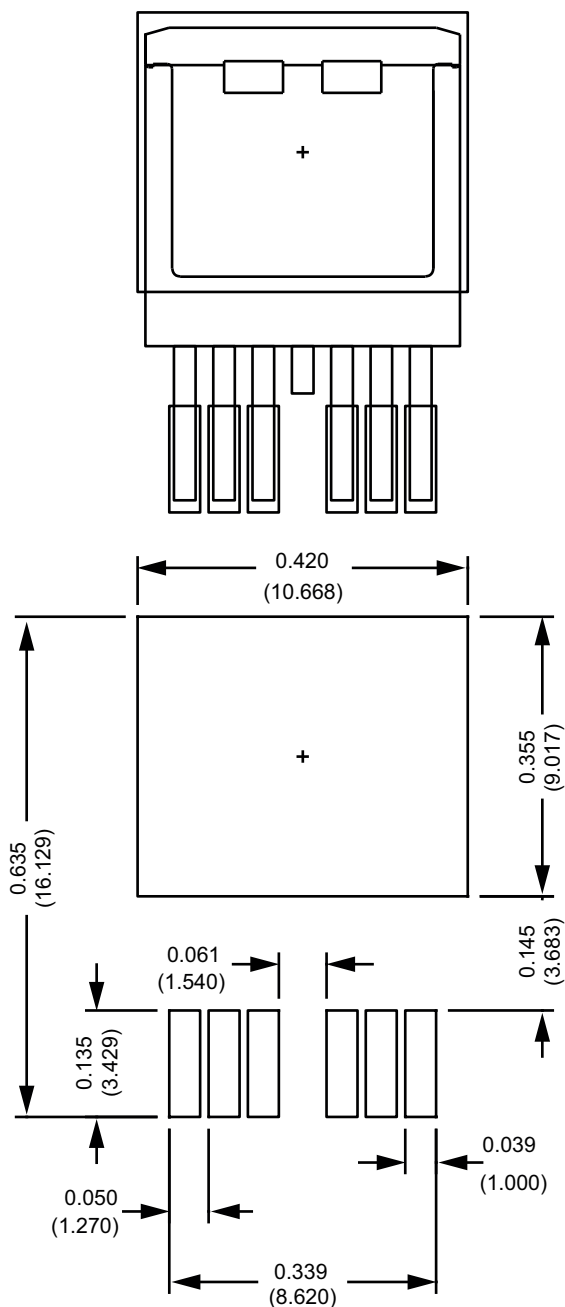


Notes

1. Dimensioning & tolerancing confirm to ASME Y14.5M-1994
2. All dimensions are in millimeters. Angles are in degrees
3. Radius on terminal is optional
4. General tolerances - linear ± 0.05
5. Plastic body angles: 5° unless otherwise specified
6. Plastic body radius: max. 0.25 unless otherwise specified
7. Plastic body finish: matt finishing $ra = 1.7 \sim 2$ microns
8. mismatch max. = 0.05 (cavity to hole axis)
9. Asterisked quotes are subjected to the SPC calculation (cp, k, cpk)

DIM.	MILLIMETERS	
	MIN.	MAX.
A	4.30	4.70
A1	-	0.25
A2	2.20	2.60
b	0.65	0.85
b1	0.65	0.80
b2	0.80	1.00
b3	0.80	0.95
c	0.45	0.60
c1	0.45	0.55
c2	1.25	1.40
D	9.00	9.40
D1	6.86	7.42
E	9.68	10.08
E1	7.70	8.30
e	1.27 BSC	
e1	7.62 BSC	
L	1.78	2.79
L1	-	1.60
L2	-	1.78
L3	0.25 BSC	
H	14.61	15.88
ECN: E26-0554-Rev. E, 19-Oct-2026		
DWG: 6006		

Recommended Land Pattern D²PAK (TO-263-7L)





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