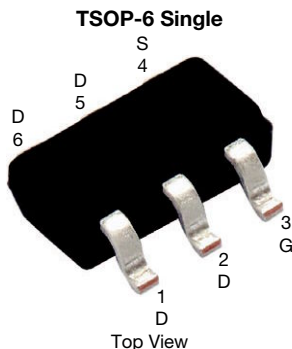


# N-Channel 100 V (D-S) MOSFET

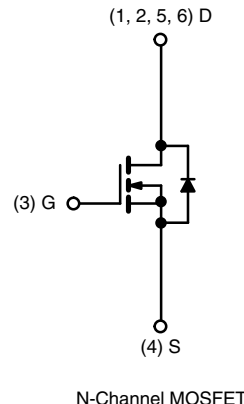


## FEATURES

- High-efficiency PWM optimized
- 100 %  $R_g$  tested
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available



## PRODUCT SUMMARY

$V_{DS}$ (V)	100
$R_{DS(on)}$ max. ( $\Omega$ ) at $V_{GS} = 10$ V	0.170
$R_{DS(on)}$ max. ( $\Omega$ ) at $V_{GS} = 6$ V	0.185
$Q_g$ typ. (nC)	5.5
$I_D$ (A)	2.4
Configuration	Single

## ORDERING INFORMATION

Package	TSOP-6
Lead (Pb)-free	Si3430DV-T1-E3
Lead (Pb)-free and halogen-free	Si3430DV-T1-GE3

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

PARAMETER	SYMBOL	5 s	STEADY STATE	UNIT
Drain-source voltage	$V_{DS}$	100	100	V
Gate-source voltage	$V_{GS}$	$\pm 20$	$\pm 20$	
Continuous drain current ( $T_J = 175$ °C) <sup>a</sup>	$I_D$	2.4	1.8	A
		1.7	1.3	
Pulsed drain current	$I_{DM}$	8	8	
Avalanche current	$I_{AR}$	6	6	
Repetitive avalanche energy (duty cycle $\leq 1$ %)	$E_{AR}$	1.8	1.8	mJ
Continuous source current (diode conduction) <sup>a</sup>	$I_S$	1.7	1	A
Maximum power dissipation <sup>a</sup>	$P_D$	2	1.14	W
		1	0.59	
Operating junction and storage temperature range	$T_J, T_{stg}$	-55 to +150	-55 to +150	°C

## THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient <sup>a</sup>	$R_{thJA}$	45	62.5	°C/W
		90	110	
Maximum junction-to-foot (drain)	$R_{thJF}$	25	30	

### Note

a. Surface mounted on 1" x 1" FR4 board



SPECIFICATIONS (T <sub>J</sub> = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Static</b>						
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250 μA	2	-	4.2	V
Gate-body leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V	-	-	± 100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 80 V, V <sub>GS</sub> = 0 V	-	-	1	μA
		V <sub>DS</sub> = 80 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 85 °C	-	-	25	
On-state drain current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 5 V, V <sub>GS</sub> = 10 V	8	-	-	A
Drain-source on-state resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2.4 A	-	0.148	0.170	Ω
		V <sub>GS</sub> = 6 V, I <sub>D</sub> = 2.3 A	-	0.160	0.185	
Forward transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 2.4 A	-	7	-	S
Diode forward voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1.7 A, V <sub>GS</sub> = 0 V	-	0.8	1.2	V
<b>Dynamic <sup>b</sup></b>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 2.4 A	-	5.5	8.2	nC
Gate-source charge	Q <sub>gs</sub>		-	1.5	-	
Gate-drain charge	Q <sub>gd</sub>		-	1.4	-	
Gate resistance	R <sub>g</sub>		1	-	4	Ω
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 50 V, R <sub>L</sub> = 50 Ω I <sub>D</sub> ≅ 1 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 6 Ω	-	9	20	ns
Rise time	t <sub>r</sub>		-	11	20	
Turn-off delay time	t <sub>d(off)</sub>		-	16	30	
Fall time	t <sub>f</sub>		-	9	20	
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> = 0.1 V, f = 5 MHz	-	2.8	-	Ω
Source-drain reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> = 1.7 A, di/dt = 100 A/μs	-	50	80	ns

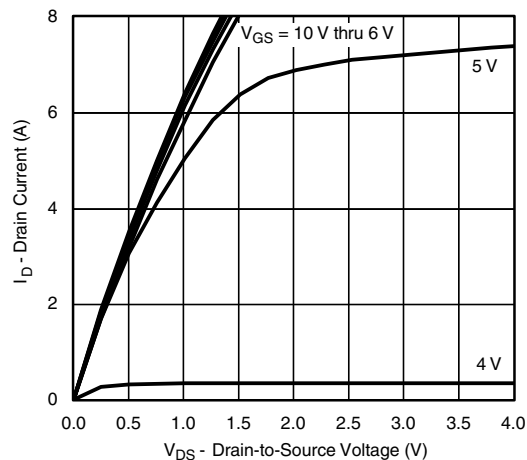
**Notes**

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %  
b. Guaranteed by design, not subject to production testing

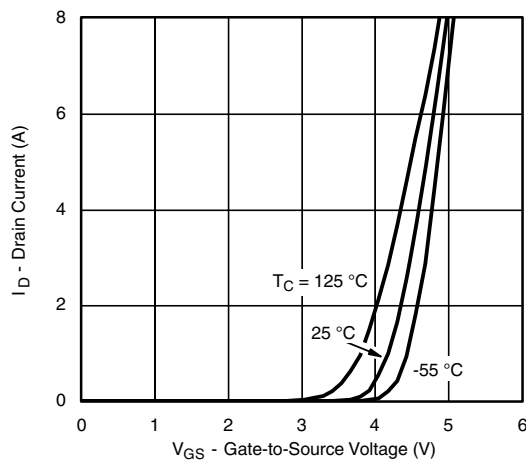
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



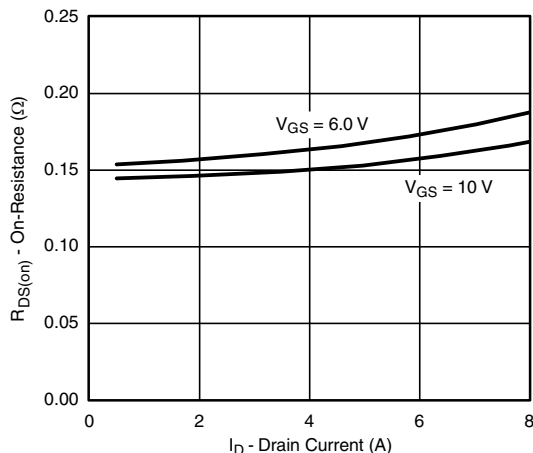
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



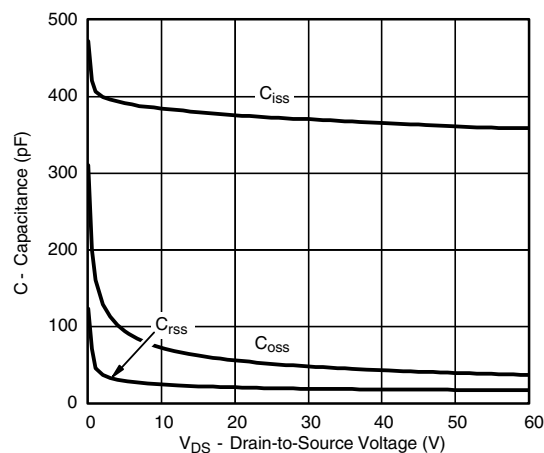
**Output Characteristics**



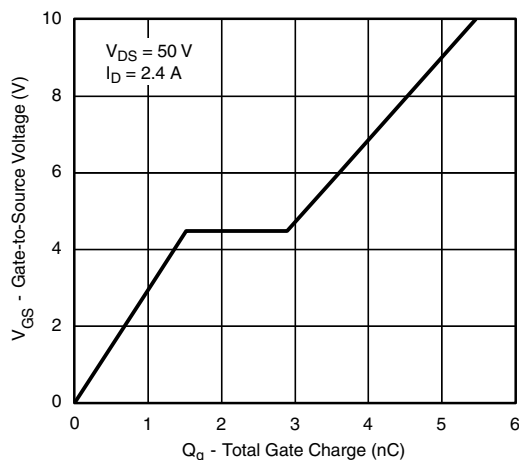
**Transfer Characteristics**



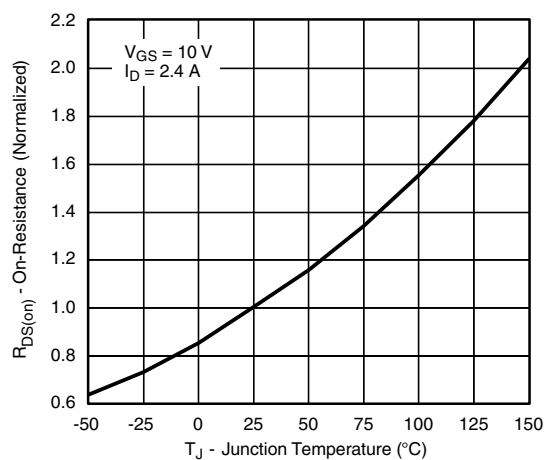
**On-Resistance vs. Drain Current**



**Capacitance**



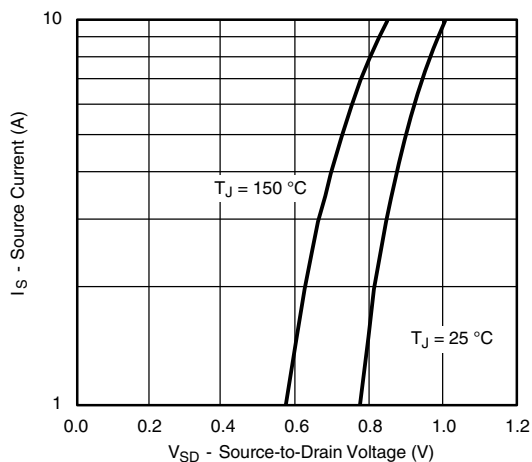
**Gate Charge**



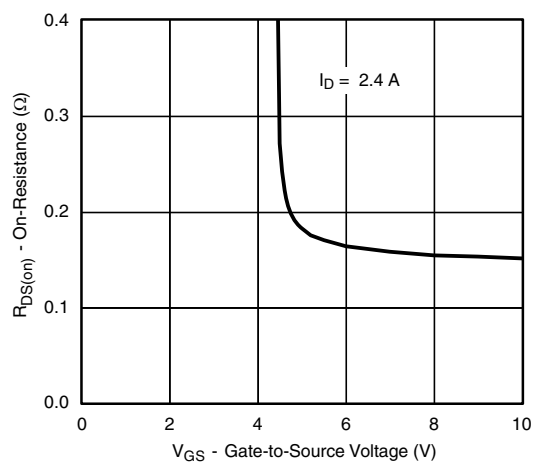
**On-Resistance vs. Junction Temperature**



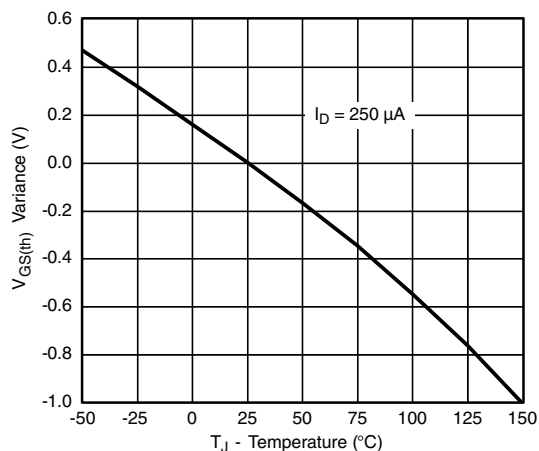
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



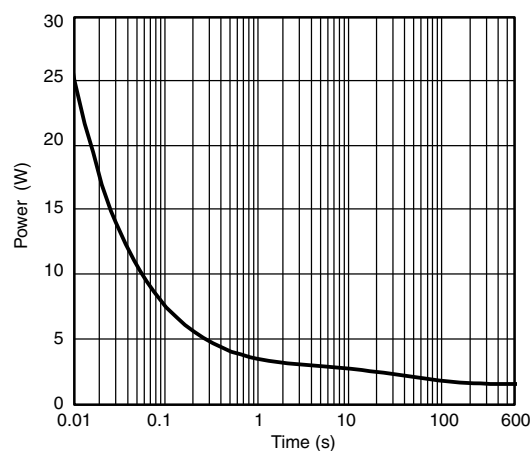
**Source-Drain Diode Forward Voltage**



**On-Resistance vs. Gate-to-Source Voltage**



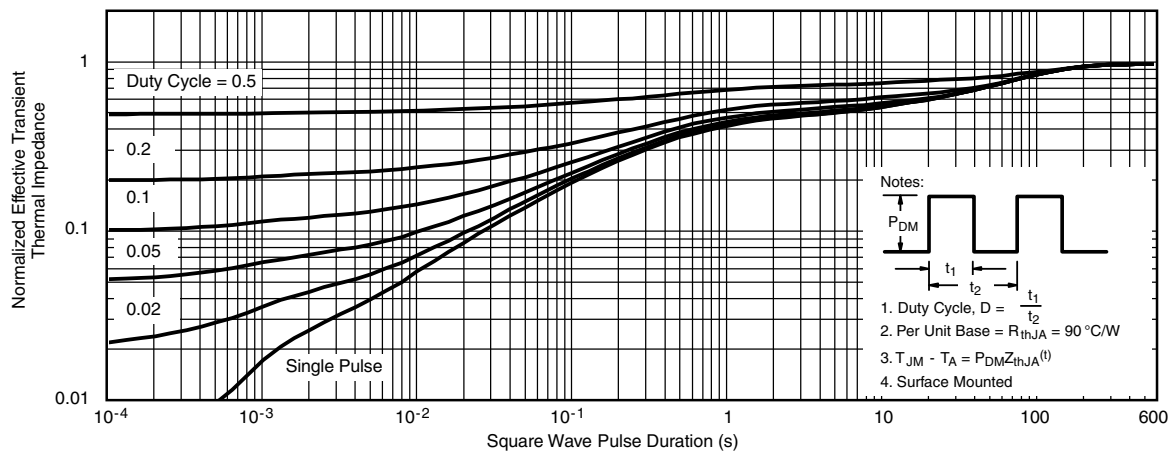
**Threshold Voltage**



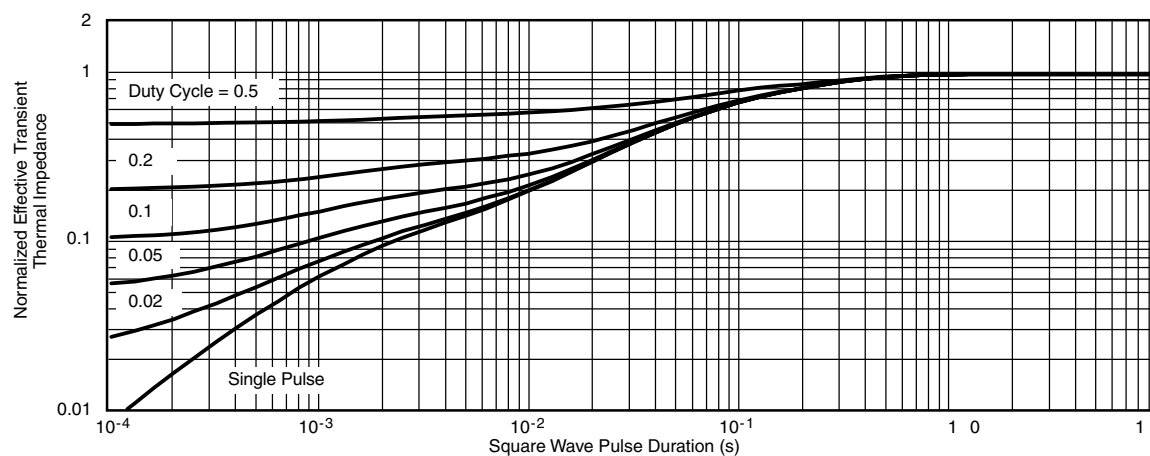
**Single Pulse Power**



**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



**Normalized Thermal Transient Impedance, Junction-to-Ambient**



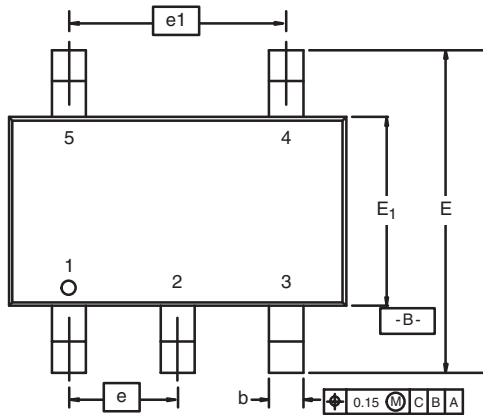
**Normalized Thermal Transient Impedance, Junction-to-Foot**

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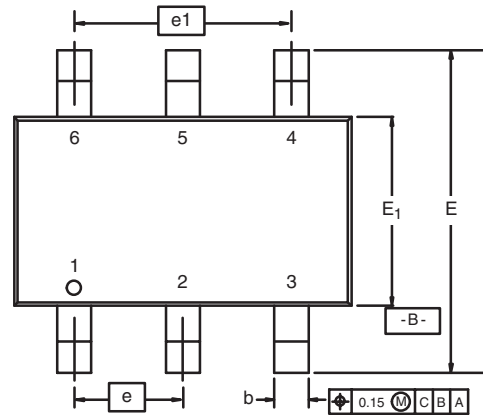


## TSOP: 5/6-LEAD

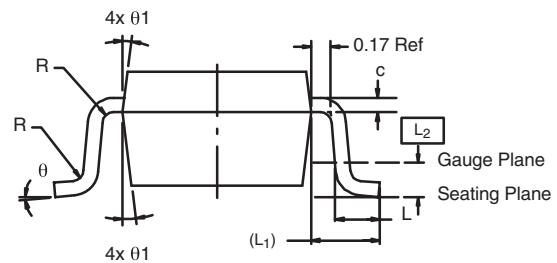
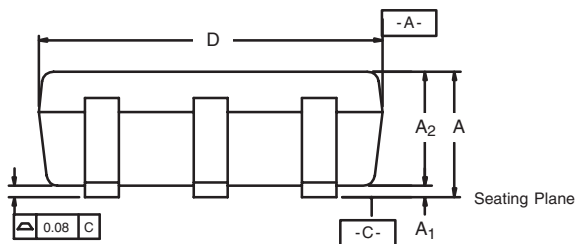
JEDEC Part Number: MO-193C



5-LEAD TSOP

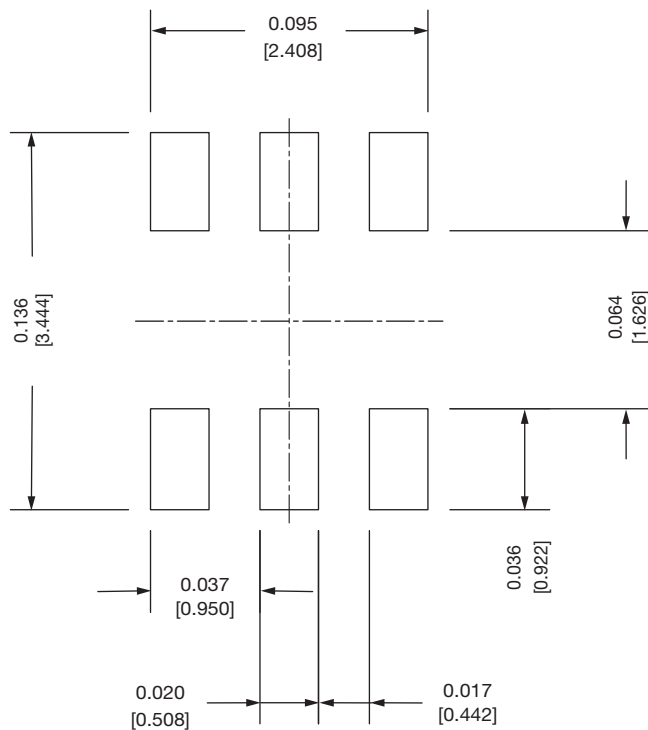
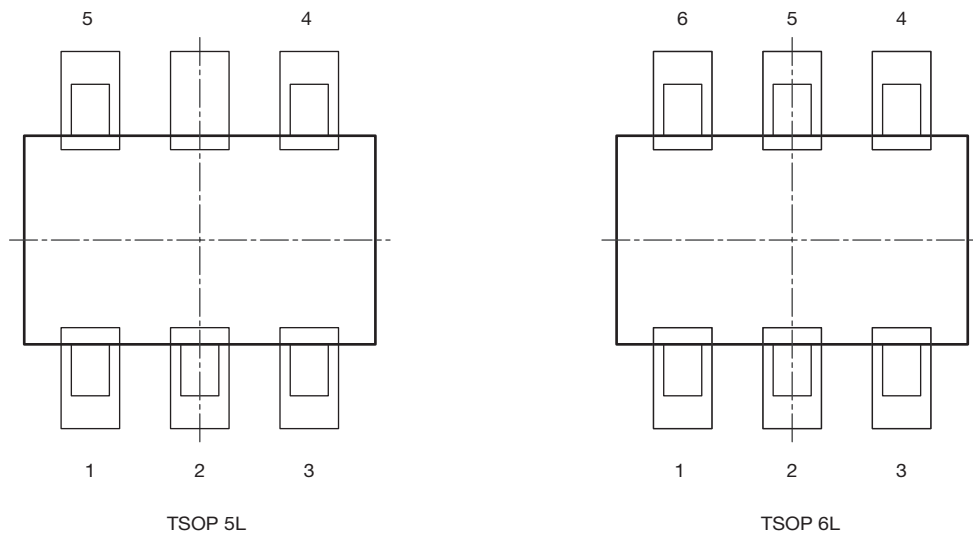


6-LEAD TSOP



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	-	1.10	0.036	-	0.043
A <sub>1</sub>	0.01	-	0.10	0.0004	-	0.004
A <sub>2</sub>	0.90	-	1.00	0.035	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.98	0.106	0.112	0.117
E <sub>1</sub>	1.55	1.65	1.70	0.061	0.065	0.067
e	0.95 BSC			0.0374 BSC		
e <sub>1</sub>	1.80	1.90	2.00	0.071	0.075	0.079
L	0.32	-	0.50	0.012	-	0.020
L <sub>1</sub>	0.60 Ref			0.024 Ref		
L <sub>2</sub>	0.25 BSC			0.010 BSC		
R	0.10	-	-	0.004	-	-
θ	0°	4°	8°	0°	4°	8°
θ <sub>1</sub>	7° Nom			7° Nom		
ECN: C-06593-Rev. I, 18-Dec-06						
DWG: 5540						

## Recommended Land Pattern For TSOP-5L / TSOP-6L


**Note**

- All dimensions are in inches (millimeter)

ECN: C22-0860-Rev. B, 24-Oct-2022  
DWG: 3010



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