

N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) Max.	I_D (A)	Q_g (Typ.)
100	0.066 at $V_{GS} = 10$ V	18.2	19.8
	0.080 at $V_{GS} = 4.5$ V	13.2	

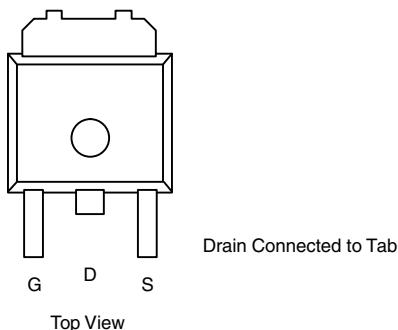
FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g and UIS Tested
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

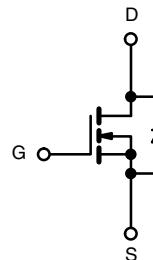
TO-252



Top View

APPLICATIONS

- DC/DC Converters
- DC/AC Inverters
- Motor Drives



N-Channel MOSFET

Ordering Information:

SUD20N10-66L-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	16.9	A
		13.6	
Pulsed Drain Current ($t = 300$ μ s)	I_{DM}	25	
Avalanche Current	I_{AS}	15	
Single Avalanche Energy ^a	E_{AS}	11.25	mJ
Maximum Power Dissipation ^a	P_D	41.7 ^b	W
		2.1	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Junction-to-Ambient (PCB Mount) ^c	R_{thJA}	60	°C/W
Junction-to-Case (Drain)	R_{thJC}	3	

Notes:

- Duty cycle ≤ 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).
- Base on $T_C = 25$ °C.

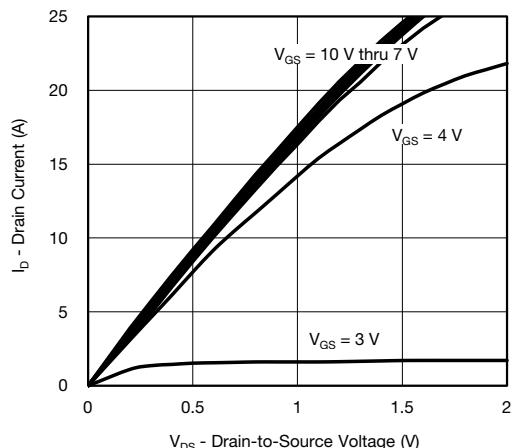
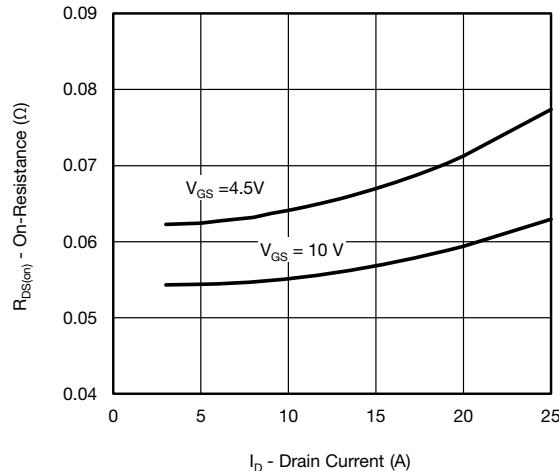
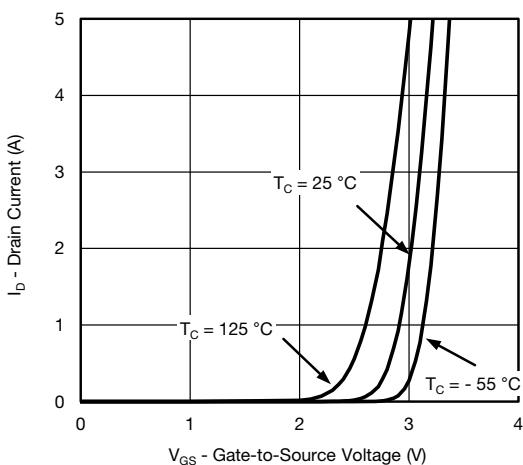
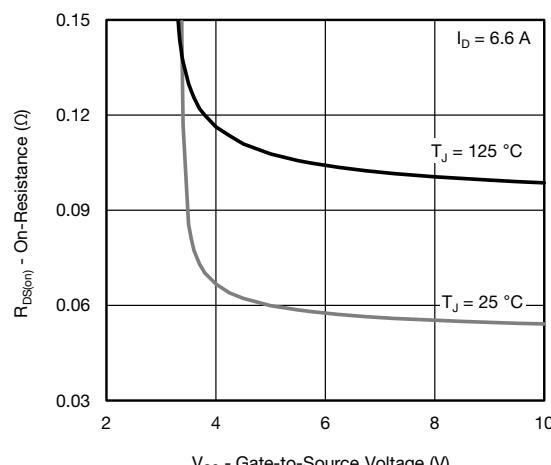
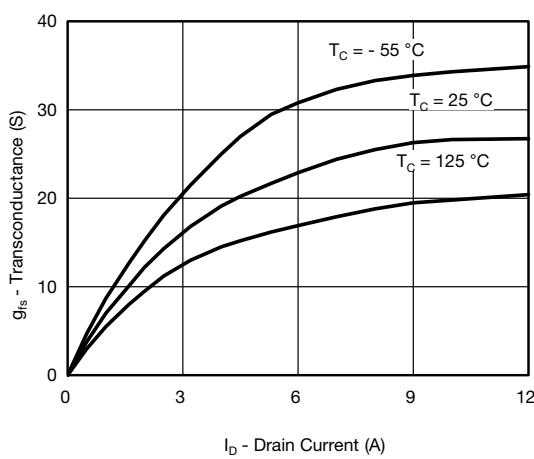
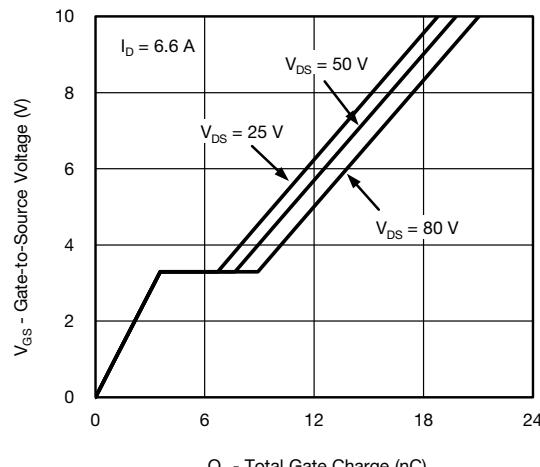
SPECIFICATIONS ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$	1.2		3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 20 \text{ V}$			± 250	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100 \text{ V}$, $V_{GS} = 0 \text{ V}$			1	μA
		$V_{DS} = 100 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 100 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 150^\circ\text{C}$			250	
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq 10 \text{ V}$, $V_{GS} = 10 \text{ V}$	20			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$, $I_D = 6.6 \text{ A}$		0.055	0.066	Ω
		$V_{GS} = 4.5 \text{ V}$, $I_D = 6 \text{ A}$		0.066	0.080	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 \text{ V}$, $I_D = 6.6 \text{ A}$		25		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 50 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$		860		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			40		
Total Gate Charge ^c	Q_g	$V_{DS} = 50 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 6.6 \text{ A}$		19.8	30	nC
Gate-Source Charge ^c	Q_{gs}			3.6		
Gate-Drain Charge ^c	Q_{gd}			4.1		
Gate Resistance	R_g		$f = 1 \text{ MHz}$	0.4	2	4
Turn-On Delay Time ^c	$t_{d(\text{on})}$	$V_{DD} = 50 \text{ V}$, $R_L = 9.6 \Omega$ $I_D \geq 5.2 \text{ A}$, $V_{GEN} = 10 \text{ V}$, $R_g = 1 \Omega$		8	16	ns
Rise Time ^c	t_r			11	20	
Turn-Off Delay Time ^c	$t_{d(\text{off})}$			18	27	
Fall Time ^c	t_f			5	10	
Turn-On Delay Time ^c	$t_{d(\text{on})}$			38	57	
Rise Time ^c	t_r	$V_{DD} = 50 \text{ V}$, $R_L = 9.6 \Omega$ $I_D \geq 5.2 \text{ A}$, $V_{GEN} = 4.5 \text{ V}$, $R_g = 1 \Omega$		58	87	ns
Turn-Off Delay Time ^c	$t_{d(\text{off})}$			18	27	
Fall Time ^c	t_f			8	16	
Drain-Source Body Diode Ratings and Characteristics^b $T_C = 25^\circ\text{C}$						
Continuous Current	I_S				16.9	A
Pulsed Current	I_{SM}				25	
Forward Voltage ^a	V_{SD}	$I_F = 5.2 \text{ A}$, $V_{GS} = 0 \text{ V}$		0.8	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 5.2 \text{ A}$, $dI/dt = 100 \text{ A}/\mu\text{s}$		34	51	ns
Peak Reverse Recovery Current	$I_{RM(\text{REC})}$			3	5	A
Reverse Recovery Charge	Q_{rr}			50	75	nC

Notes:

- a. Pulse test; pulse width $\leq 300 \mu\text{s}$, 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.

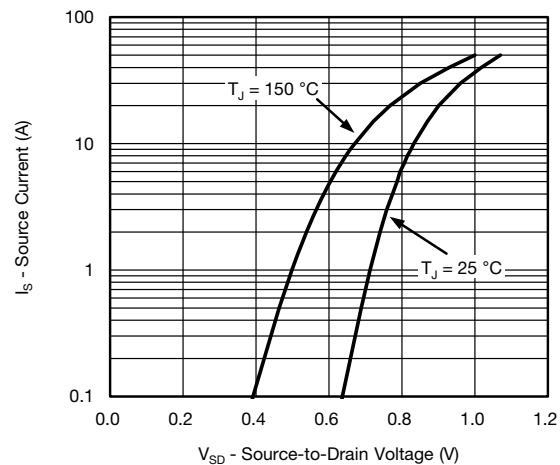
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

On-Resistance vs. Drain Current

Transfer Characteristics

On-Resistance vs. Gate-to-Source Voltage

Transconductance

Gate Charge

SUD20N10-66L

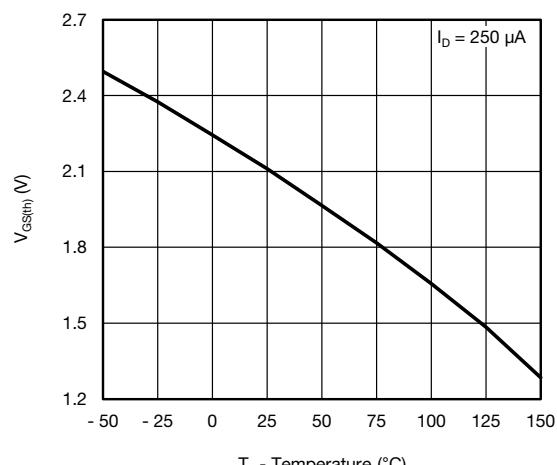
Vishay Siliconix



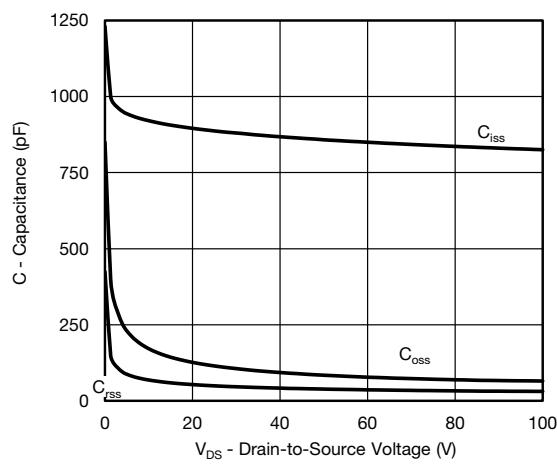
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



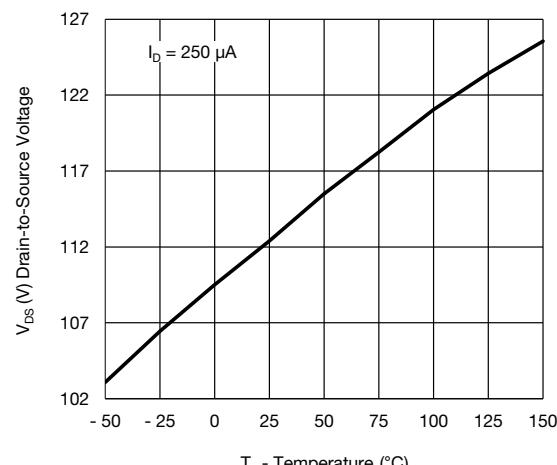
Source-Drain Diode Forward Voltage



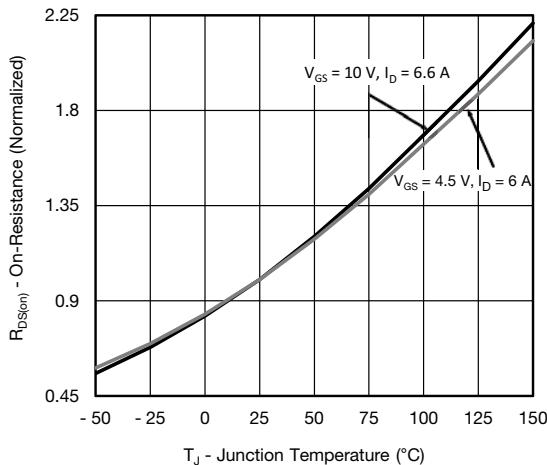
Threshold Voltage



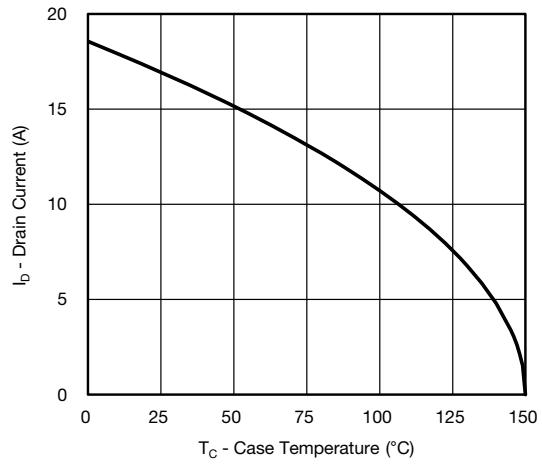
Capacitance



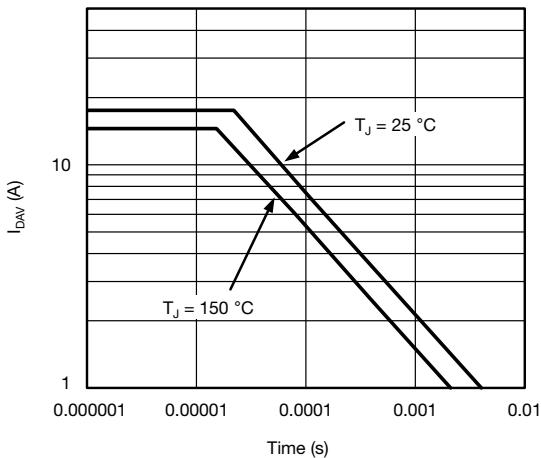
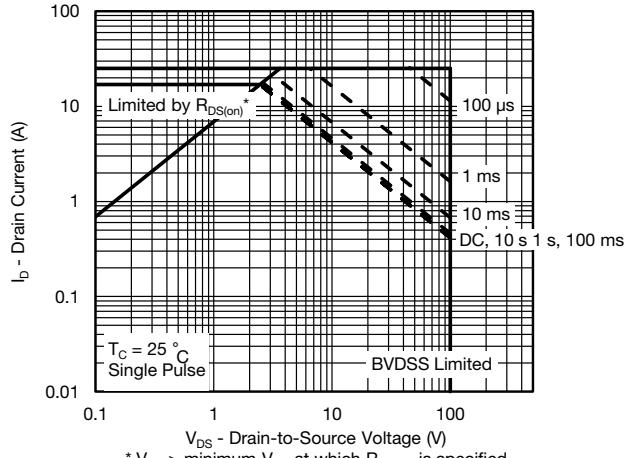
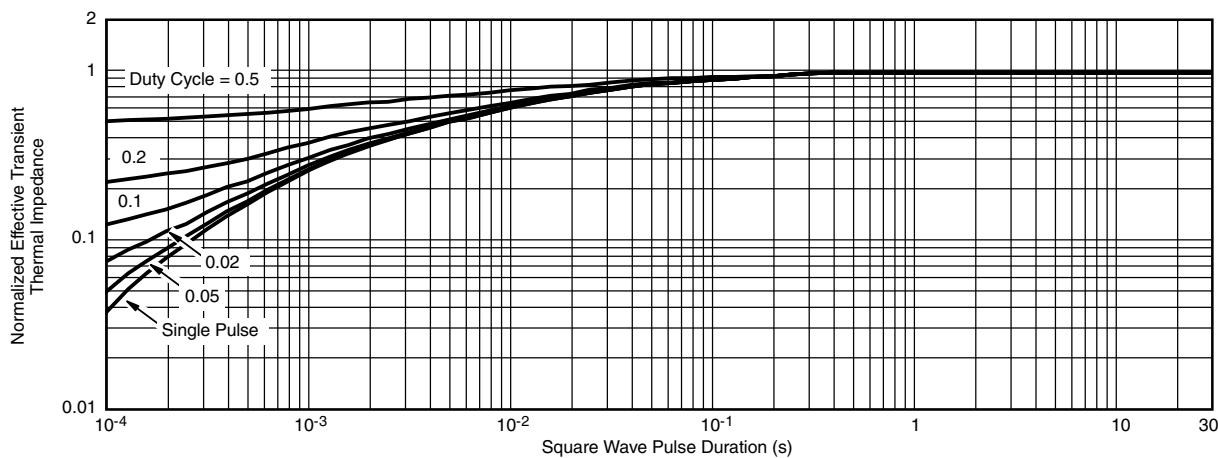
Drain Source Breakdown vs. Junction Temperature



On-Resistance vs. Junction Temperature



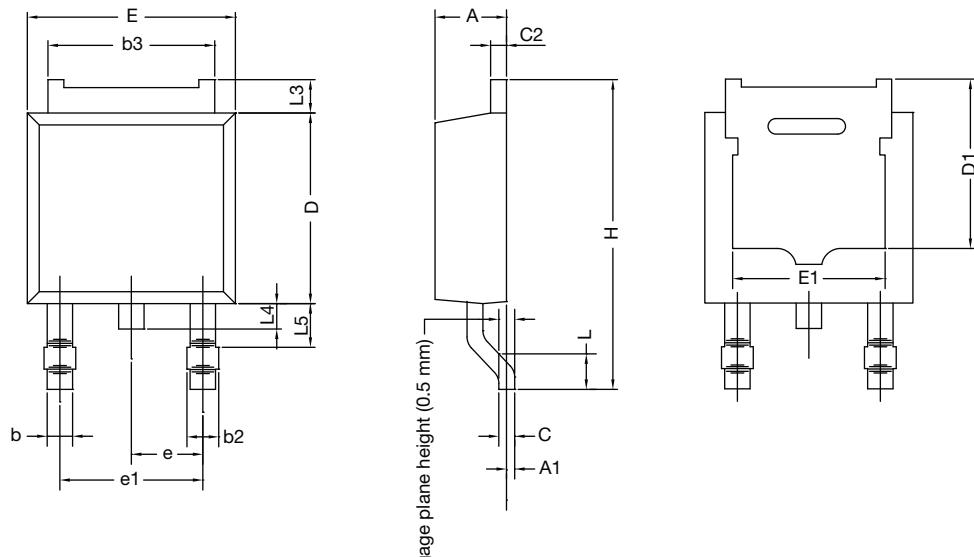
Current Derating

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Single Pulse Avalanche Current Capability vs. Time

Safe Operating Area

Normalized Thermal Transient Impedance, Junction-to-Case

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?62815.

TO-252AA Case Outline

VERSION 1: FACILITY CODE = Y

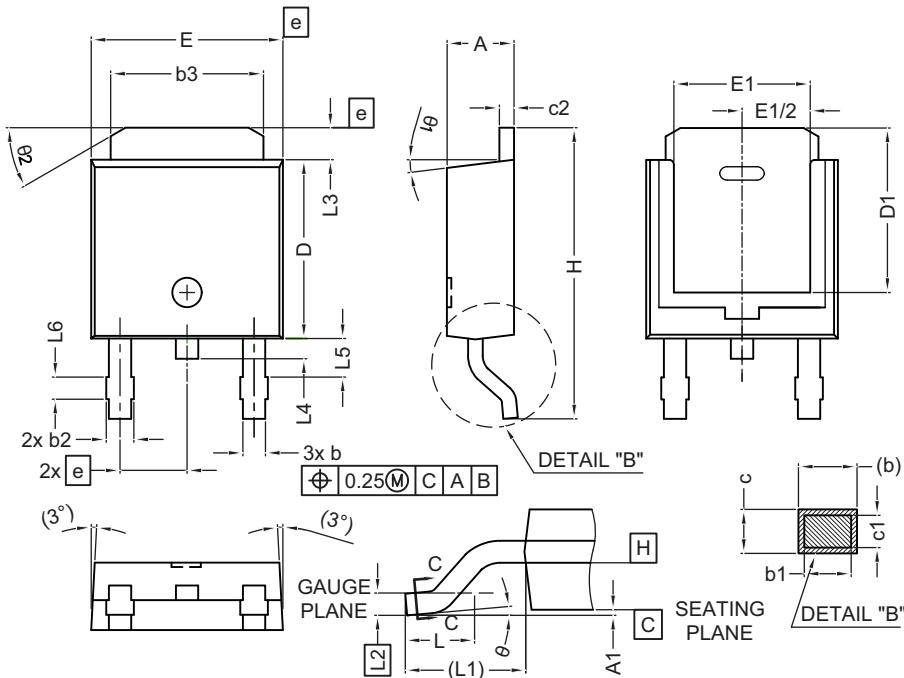


MILLIMETERS		
DIM.	MIN.	MAX.
A	2.18	2.38
A1	-	0.127
b	0.64	0.88
b2	0.76	1.14
b3	4.95	5.46
C	0.46	0.61
C2	0.46	0.89
D	5.97	6.22
D1	4.10	-
E	6.35	6.73
E1	4.32	-
H	9.40	10.41
e	2.28 BSC	
e1	4.56 BSC	
L	1.40	1.78
L3	0.89	1.27
L4	-	1.02
L5	1.01	1.52

Note

- Dimension L3 is for reference only

VERSION 2: FACILITY CODE = N



MILLIMETERS		
DIM.	MIN.	MAX.
A	2.18	2.39
A1	-	0.13
b	0.65	0.89
b1	0.64	0.79
b2	0.76	1.13
b3	4.95	5.46
c	0.46	0.61
c1	0.41	0.56
c2	0.46	0.60
D	5.97	6.22
D1	5.21	-
E	6.35	6.73
E1	4.32	-
e	2.29 BSC	
H	9.94	10.34

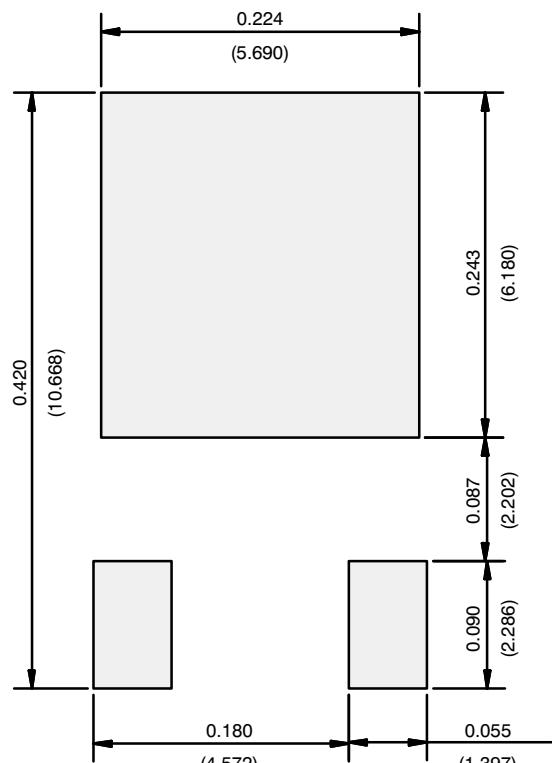
 MILLIMETERS		
DIM.	MIN.	MAX.
L	1.50	1.78
L1	2.74 ref.	
L2	0.51 BSC	
L3	0.89	1.27
L4	-	1.02
L5	1.14	1.49
L6	0.65	0.85
θ	0°	10°
01	0°	15°
02	25°	35°

Notes

- Dimensioning and tolerance confirm to ASME Y14.5M-1994
- All dimensions are in millimeters. Angles are in degrees
- Heat sink side flash is max. 0.8 mm
- Radius on terminal is optional

ECN: E19-0649-Rev. Q, 16-Dec-2019
DWG: 5347

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



**Recommended Minimum Pads
Dimensions in Inches/(mm)**

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