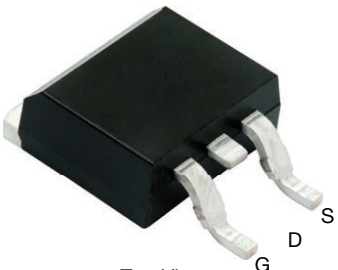
N-Channel 200 V (D-S) 175 °C MOSFET

TO-263



Top View

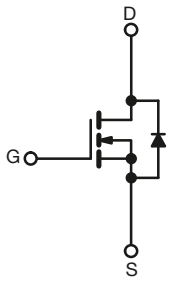
FEATURES

- ThunderFET® power MOSFET
- Low R_{DS} - Q_g figure-of-merit (FOM)
- Maximum 175 °C junction temperature
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

- Synchronous rectification
- Power supplies
- DC/AC inverter
- DC/DC converter
- Solar micro inverter
- Motor drive switch



N-Channel MOSFET

PRODUCT SUMMARY	
V_{DS} (V)	200
$R_{DS(on)}$ max. (Ω) at V_{GS} = 10 V	0.0216
$R_{DS(on)}$ max. (Ω) at V_{GS} = 7.5 V	0.0235
Q_g typ. (nC)	31.6
I_D (A)	64
Configuration	Single

ORDERING INFORMATION	
Package	TO-263
Lead (Pb)-free and halogen-free	SUM90220E-GE3

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

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	200	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	T_C = 25 °C	I_D	64	A
	T_C = 125 °C		37	
Pulsed drain current (t = 100 µs)		I_{DM}	100	
Continuous source-drain diode current		I_S	64.7	
Single pulse avalanche current [a]	L = 0.1 mH	I_{AS}	45	
Single pulse avalanche energy [a]		E_{AS}	101	mJ
Maximum power dissipation	T_C = 25 °C	P_D	230 [b]	W
	T_C = 125 °C		77 [b]	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +175	°C
Soldering recommendations (peak temperature) [c]			260	

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	MAXIMUM	UNIT
Maximum junction-to-ambient (PCB mount) [c]		R_{thJA}	40	°C/W
Maximum junction-to-case (drain)	Steady state	R_{thJC}	0.65	

Notes

a. Duty cycle ≤ 1 %.
b. See SOA curve for voltage derating.
c. When mounted on 1" square PCB (FR4 material).

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SPECIFICATIONS (T_J = 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	200	-	-	V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	-	4	V
Gate-source leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	250	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 200 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 200 V, V_{GS} = 0 V, T_J = 125 °C	-	-	150	
		V_{DS} = 200 V, V_{GS} = 0 V, T_J = 175 °C	-	-	5	mA
On-state drain current [a]	$I_{D(on)}$	V_{DS} ≥ 10 V, V_{GS} = 10 V	30	-	-	A
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 15 A	-	0.0180	0.0216	Ω
		V_{GS} = 7.5 V, I_D = 10 A	-	0.0188	0.0235	
Forward transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 15 A	-	37	-	S
Dynamic [b]						
Input capacitance	C_{iss}	V_{DS} = 100 V, V_{GS} = 0 V, f = 1 MHz	-	1950	-	pF
Output capacitance	C_{oss}		-	170	-	
Reverse transfer capacitance	C_{rss}		-	15	-	
Total gate charge	Q_g	V_{DS} = 100 V, V_{GS} =10 V, I_D = 15 A	-	31.6	48	nC
Gate-source charge	Q_{gs}		-	8.6	-	
Gate-drain charge	Q_{gd}		-	7.6	-	
Gate resistance	R_g	f = 1 MHz	0.6	3	6	Ω
Turn-on delay time	$t_{d(on)}$	V_{DD} = 100 V, R_L = 8.3 Ω, I_D ≅ 12 A, V_{GEN} = 10 V, R_g = 1 Ω	-	15	30	ns
Rise time	t_r		-	35	53	
Turn-off delay time	$t_{d(off)}$		-	28	42	
Fall time	t_f		-	38	57	
Drain-Source Body Diode Characteristics						
Pulse diode forward current (t = 100 µs)	I_{SM}		-	-	100	A
Body diode voltage	V_{SD}	I_F = 12 A, V_{GS} = 0 V	-	0.85	1.5	V
Body diode reverse recovery time	t_{rr}	I_F = 12 A, di/dt = 100 A/µs	-	120	180	ns
Body diode reverse recovery charge	Q_{rr}		-	0.91	1.37	µC
Reverse recovery fall time	t_a		-	95	-	ns
Reverse recovery rise time	t_b		-	25	-	
Body diode peak reverse recovery charge	$I_{RM(REC)}$		-	12	18	A

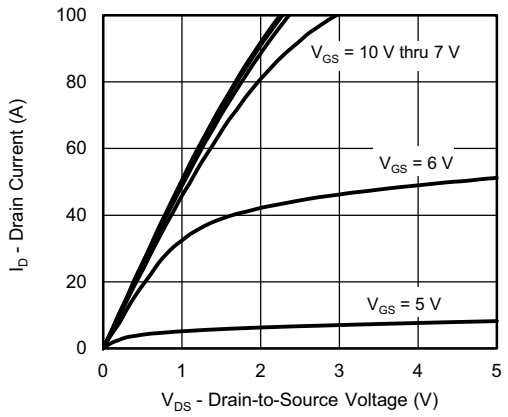
Notes

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

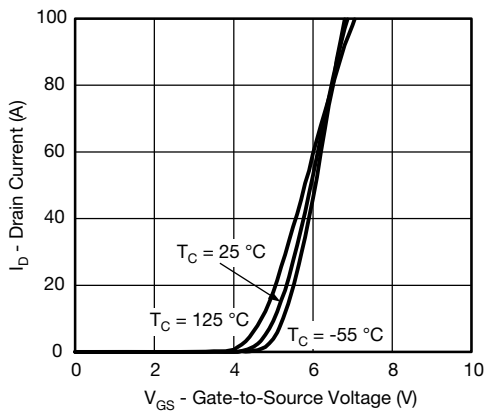
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

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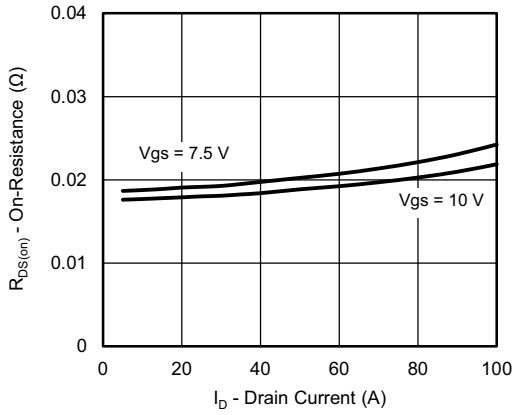
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



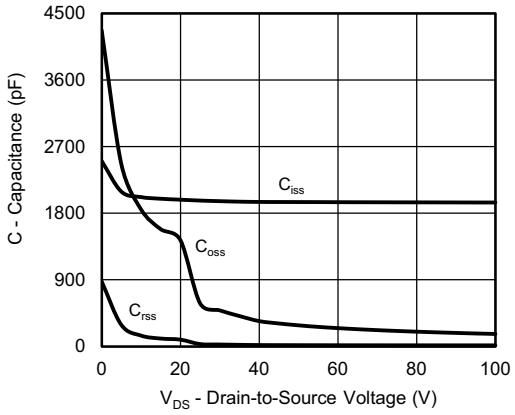
Output Characteristics



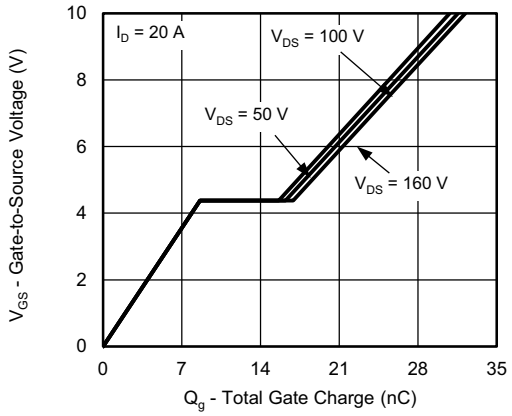
Transfer Characteristics



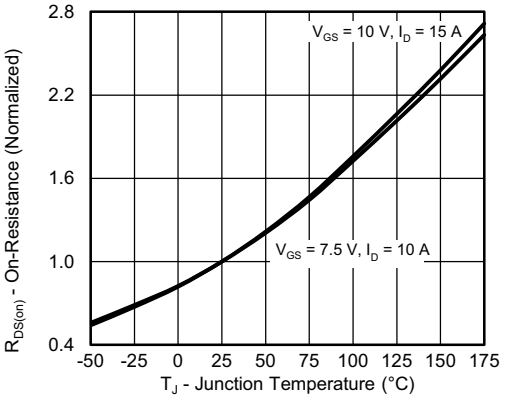
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



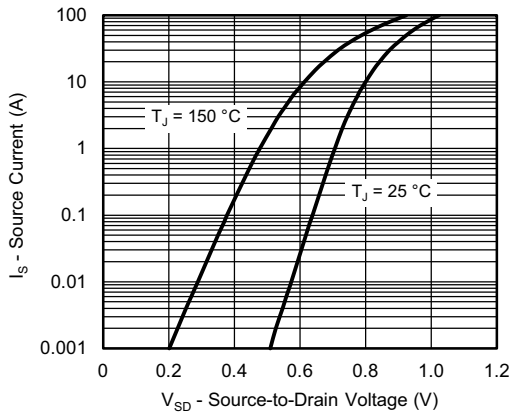
Gate Charge



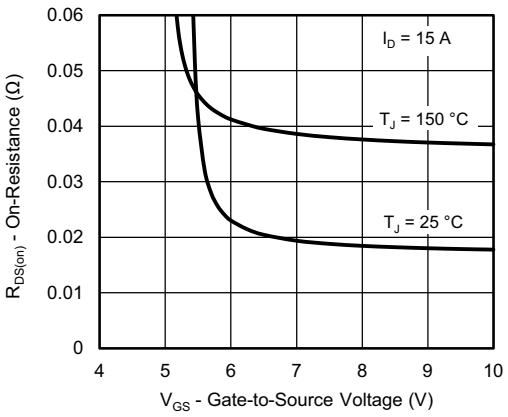
On-Resistance vs. Junction Temperature

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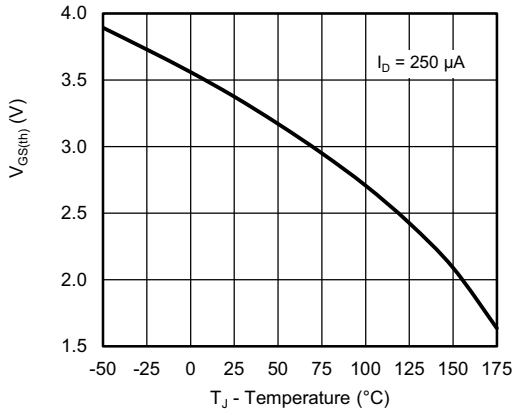
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



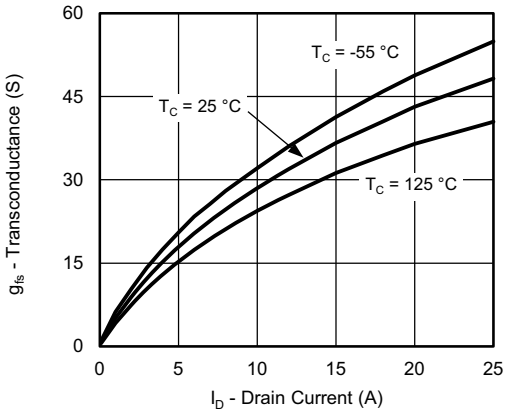
Source-Drain Diode Forward Voltage



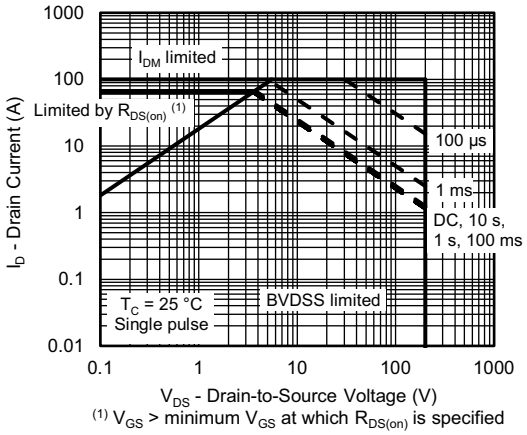
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



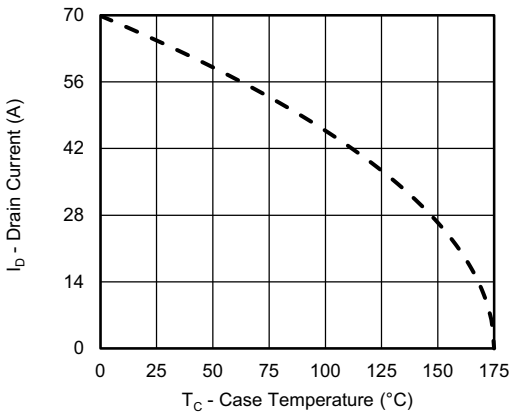
Transconductance



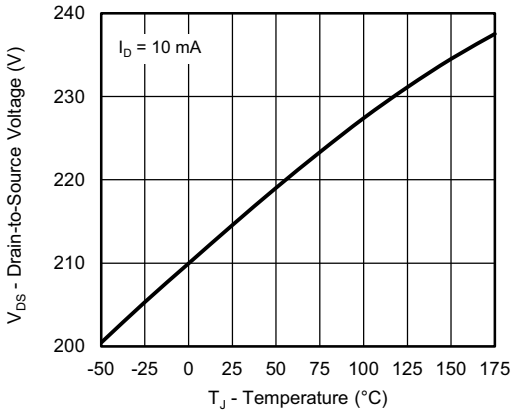
Safe Operating Area, Junction-to-Ambient

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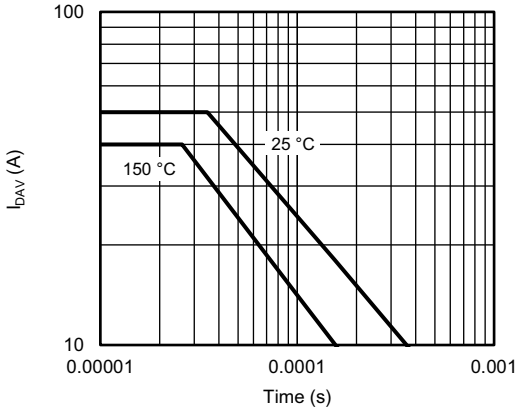
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating [a]



Drain Source Breakdown vs. Junction Temperature



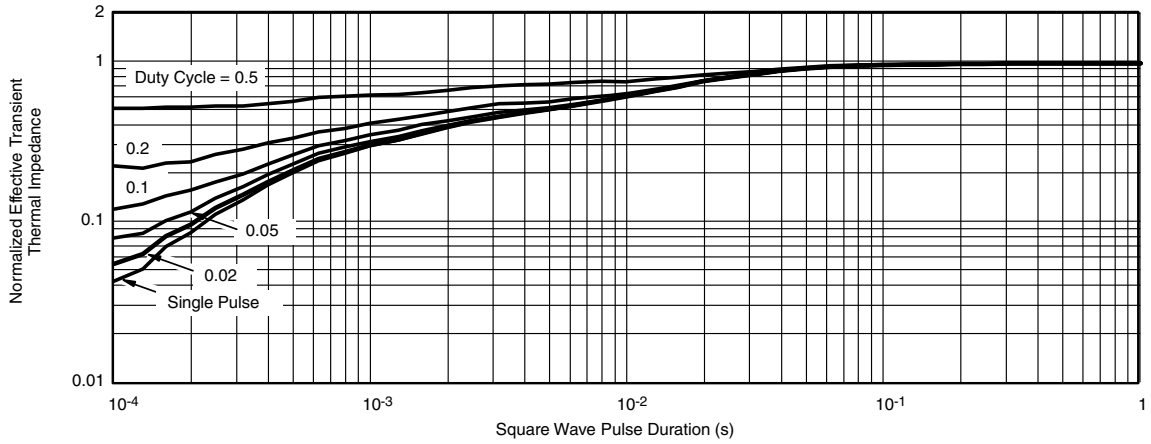
I_{DAV} vs. Time

Note

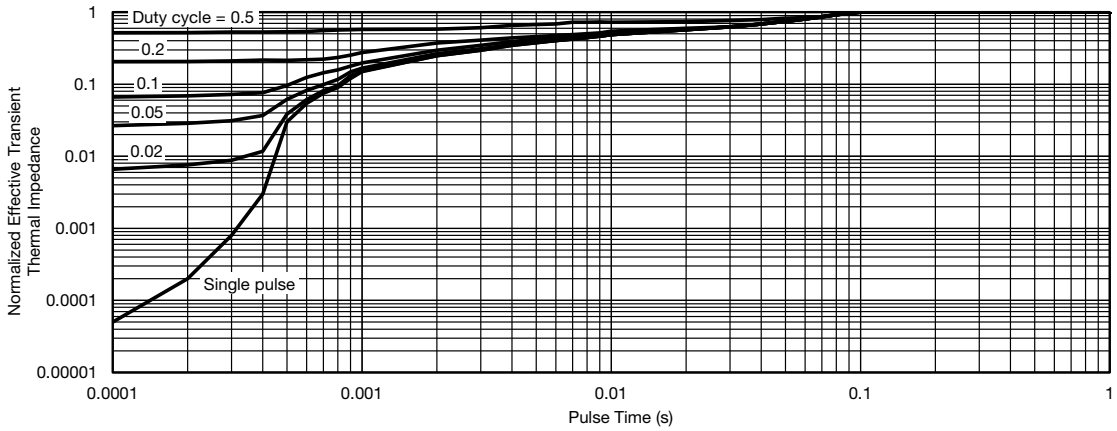
a. The power dissipation P_D is based on T_J max. = 25 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



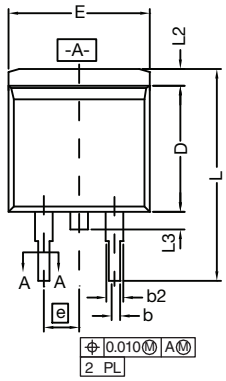
Normalized Thermal Transient Impedance, Junction-to-Case

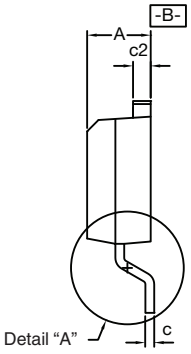
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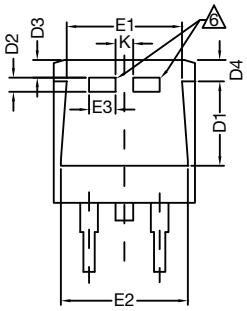
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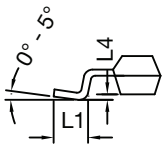
TO-263 (D²PAK): 3-LEAD

VERSION 1: FACILITY CODE = T

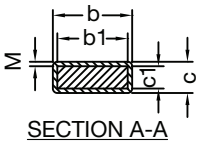








DETAIL A (ROTATED 90°)



SECTION A-A

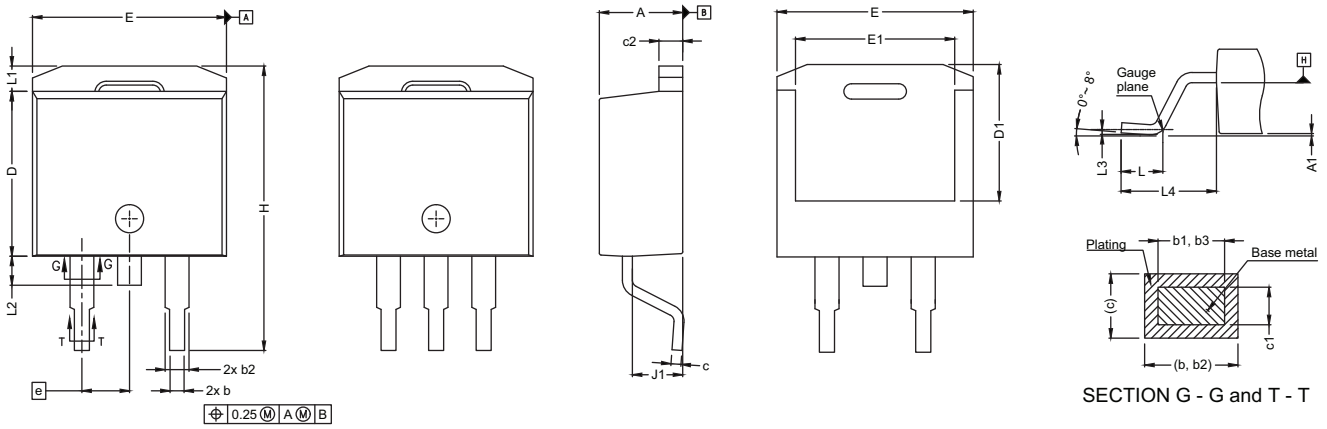
DIM.		INCHES		MILLIMETERS	
		MIN.	MAX.	MIN.	MAX.
A		0.160	0.190	4.064	4.826
b		0.020	0.039	0.508	0.990
b1		0.020	0.035	0.508	0.889
b2		0.045	0.055	1.143	1.397
c*	Thin lead	0.013	0.018	0.330	0.457
	Thick lead	0.023	0.028	0.584	0.711
c1	Thin lead	0.013	0.017	0.330	0.431
	Thick lead	0.023	0.027	0.584	0.685
c2		0.045	0.055	1.143	1.397
D		0.340	0.380	8.636	9.652
D1		0.220	0.240	5.588	6.096
D2		0.038	0.042	0.965	1.067
D3		0.045	0.055	1.143	1.397
D4		0.044	0.052	1.118	1.321
E		0.380	0.410	9.652	10.414
E1		0.245	-	6.223	-
E2		0.355	0.375	9.017	9.525
E3		0.072	0.078	1.829	1.981
e		0.100 BSC		2.54 BSC	
K		0.045	0.055	1.143	1.397
L		0.575	0.625	14.605	15.875
L1		0.090	0.110	2.286	2.794
L2		0.040	0.055	1.016	1.397
L3		0.050	0.070	1.270	1.778
L4		0.010 BSC		0.254 BSC	
M		-	0.002	-	0.050

Notes

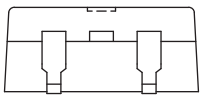
1. Plane B includes maximum features of heat sink tab and plastic.
2. No more than 25 % of L1 can fall above seating plane by max. 8 mils.
3. Pin-to-pin coplanarity max. 4 mils.
4. *: Thin lead is for SUB, SYB.
   Thick lead is for SUM, SYM, SQM.
5. Use inches as the primary measurement.
6. This feature is for thick lead.

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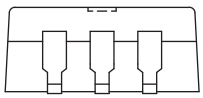
VERSION 2: FACILITY CODE = N



SECTION G - G and T - T



OPTION 1
2 leads

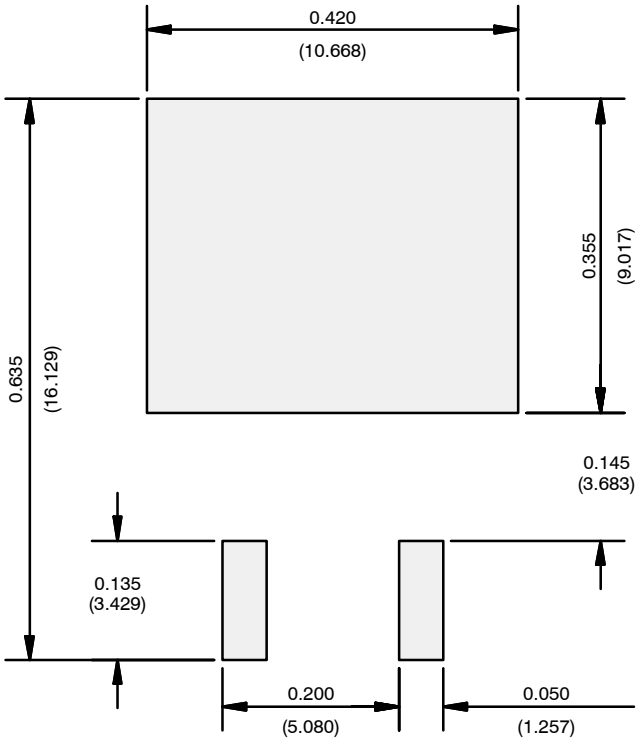


OPTION 2
3 leads

DIM.	MIN.	MAX.
A	4.36	4.56
A1	0	0.25
b	0.70	0.90
b1	0.51	0.89
b2	1.20	1.46
b3	1.17	1.37
c	0.38	0.694
c1	0.38	0.534
c2	1.19	1.34
D	8.60	9.00
D1	6.9	7.5
E	10.15	10.55
E1	8.1	8.7
e	2.54 BSC	
H	15.0	15.6
L	1.9	2.5
L1	-	1.65
L2	-	1.78
L3	0.25 typ.	
L4	4.78	5.28
J1	2.56	2.96
ECN: S24-1080-Rev. L, 28-Oct-2024 DWG: 5843		

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RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead



Recommended Minimum Pads
Dimensions in Inches/(mm)

Return to Index

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Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

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Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

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Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

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