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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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STGB7NB40LZ

N-CHANNEL CLAMPED 14A - D²PAK INTERNALLY CLAMPED PowerMESH™ IGBT

TYPE	V _{CES}	V _{CE(sat)}	I _C
STGB7NB40LZ	CLAMPED	< 1.50 V	14 A

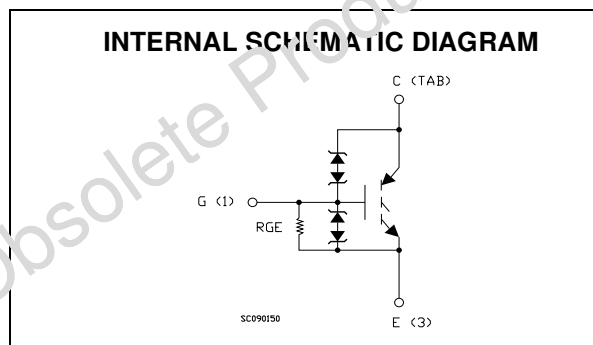
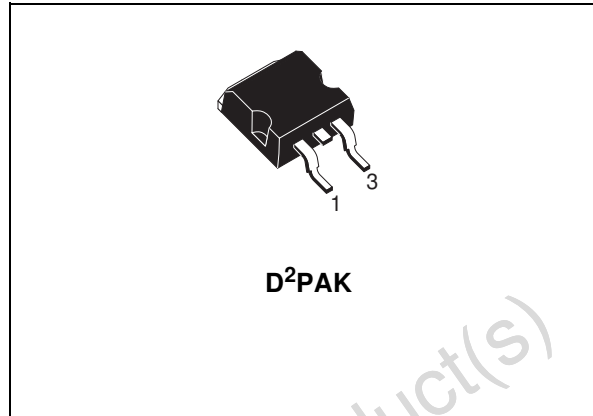
- POLYSILICON GATE VOLTAGE DRIVEN
- LOW THRESHOLD VOLTAGE
- LOW ON-VOLTAGE DROP
- LOW GATE CHARGE
- HIGH CURRENT CAPABILITY
- HIGH VOLTAGE CLAMPING FEATURE

DESCRIPTION

Using the latest high voltage technology based on a patented strip layout, STMicroelectronics has designed an advanced family of IGBTs, the PowerMESH™ IGBTs, with outstanding performances. The built in collector-gate zener exhibits a very precise active clamping while the gate-emitter zener supplies an ESD protection.

APPLICATIONS

- AUTOMOTIVE IGNITION



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CES}	Collector-Emitter Voltage (V _{GS} = 0)	CLAMPED	V
V _{ECR}	Reverse Battery Protection	20	V
V _{GE}	Gate-Emitter Voltage	CLAMPED	V
I _C	Collector Current (continuous) at 100°C	14	A
R _g	Minimum External Gate Resistor	500	Ω
P _{TOT}	Total Dissipation at T _C = 25°C	100	W
	Derating Factor	0.66	W/°C
E _{CL}	Single Pulse Collector to Emitter Avalanche Energy I _C = 13 A ; T _j = 150°C (see fig. 1-2)	130	mJ
E _{ECAV}	Reverse Avalanche Energy I _C = 7 A ; f = 100 Hz ; T _C = 25°C	10	mJ
T _{stg}	Storage Temperature	-55 to 175	°C
T _j	Operating Junction Temperature		

STGB7NB40LZ

THERMAL DATA

Rthj-case	Thermal Resistance Junction-case Max	1.5	°C/W
Rthj-amb	Thermal Resistance Junction-ambient Max (free air)	62.5	°C/W

ELECTRICAL CHARACTERISTICS (T_{CASE} = 25°C UNLESS OTHERWISE SPECIFIED)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV _(CES)	Collector-Emitter Clamped Voltage	I _C = 10 mA, V _{GE} = 0, T _C = -40°C to 150°C; R _G = 1 KΩ	370	400	430	V
BV _(ECS)	Emitter Collector Break-down Voltage	I _{EC} = 75 mA, V _{GE} = 0,	20	27		V
BV _{GE}	Gate Emitter Break-down Voltage	I _G = ± 2 mA	12		16	V
I _{CES}	Collector-Emitter Leakage Current	V _{GE} = 200 V, V _{CE} = 0, R _G = 1 KΩ T _C = 25°C T _C = 150°C			25 250	μA μA
I _{GES}	Gate-Emitter Leakage Current (V _{CE} = 0)	V _{GE} = ± 10 V, V _{CE} = 0			1000	μA

ON (1)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{GE(th)}	Gate Threshold Voltage	V _{CE} = V _{GE} , I _C = 1 mA, T _C = 25°C V _{CE} = V _{GE} , I _C = 1 mA, T _C = 150°C	1.2 0.75		2.2 1.8	V V
V _{CE(SAT)}	Collector-Emitter Saturation Voltage	V _{GE} = 4.5 V, I _C = 7 A, T _j = 25°C V _{GE} = 5.0 V, I _C = 14 A, T _C = 25°C		1.3	1.50 1.9	V V
R _{GE}	Gate Emitter Resistance		10	20	30	KΩ

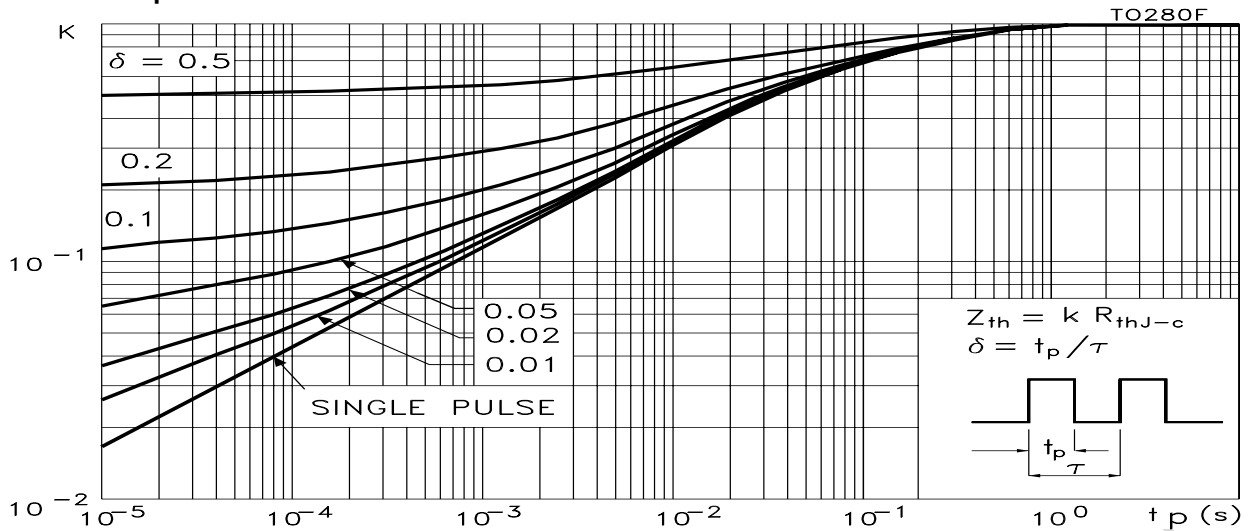
DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C _{ies}	Input Capacitance	V _{CE} = 25 V, f = 1 MHz, V _{GE} = 0		910		pF
C _{oes}	Output Capacitance			80		pF
C _{res}	Reverse Transfer Capacitance			15		pF
Q _g	Gate Charge	V _{CE} = 40 V, I _C = 7 A, V _{GE} = 5 V		22		nC

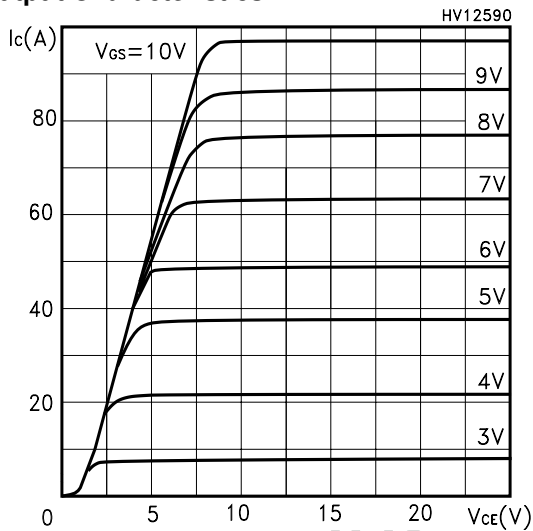
SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t _{d(on)} t _r	Delay Time Current Rise Time	V _{CE} = 14 V, R _G = 1KΩ, R _L = 1Ω, V _{GE} = 5 V		0.9 4.5		μs μs
t _{d(off)} t _f	Delay Time Current Fall Time	V _{CE} = 300 V, R _G = 1KΩ, R _L = 46Ω, V _{GE} = 5 V		4.4 3.6		μs μs

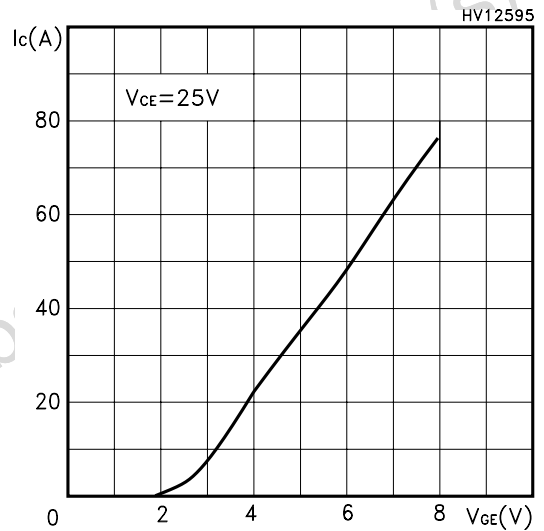
Thermal Impedance



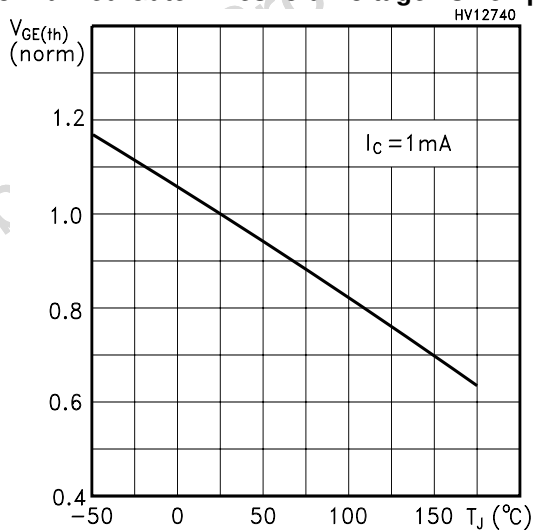
Output Characteristics



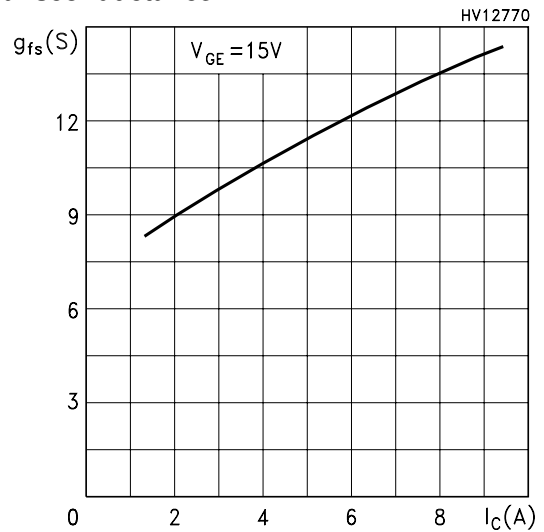
Transfer Characteristics



Normalized Gate Threshold Voltage vs Temp.

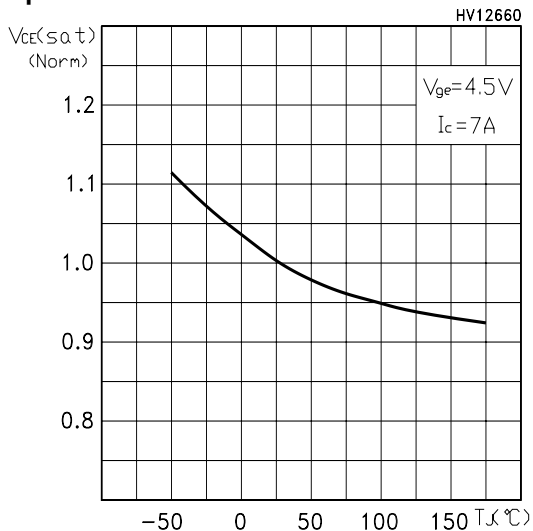


Transconductance

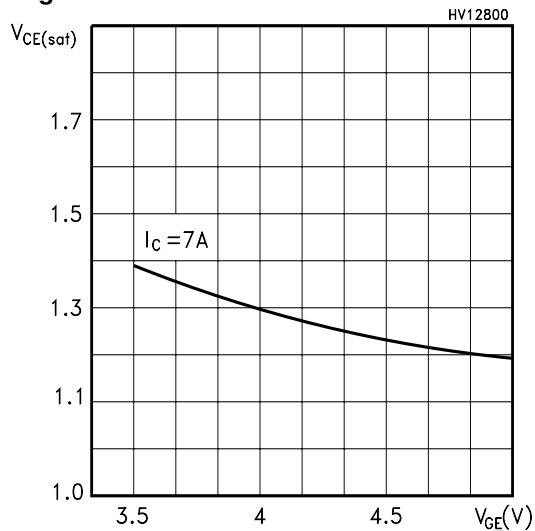


STGB7NB40LZ

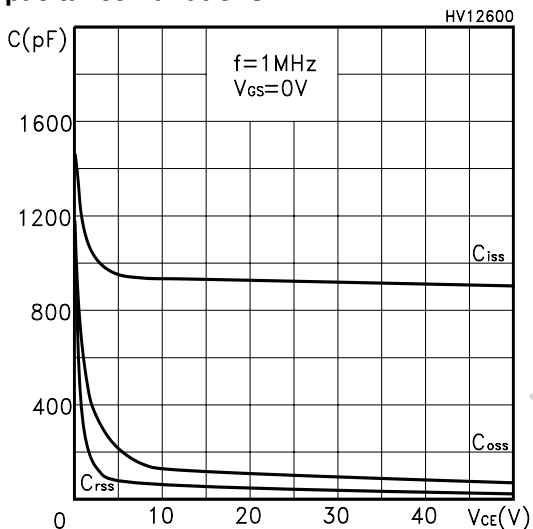
Normalized Collector-Emitter On Voltage vs Temperature



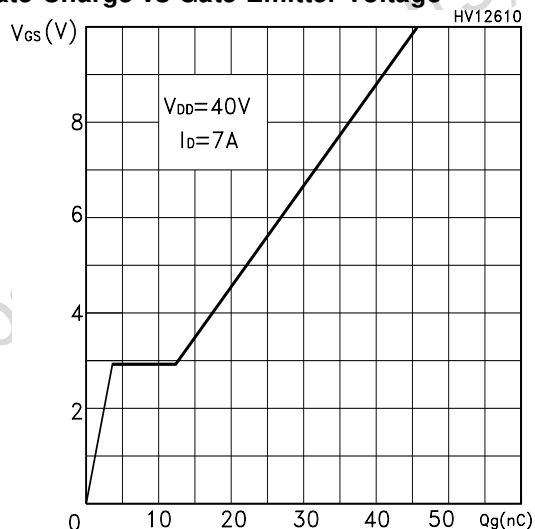
Collector-Emitter On Voltage vs Gate-Emitter Voltage



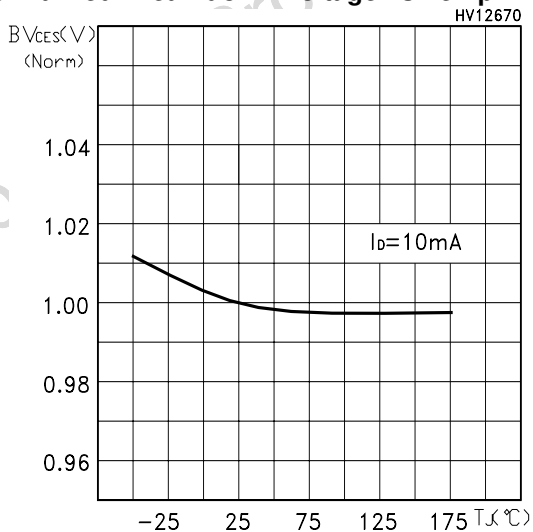
Capacitance Variations



Gate-Charge vs Gate-Emitter Voltage



Normalized Break-down Voltage vs Temp.



Clamping Voltage vs Gate Resistance

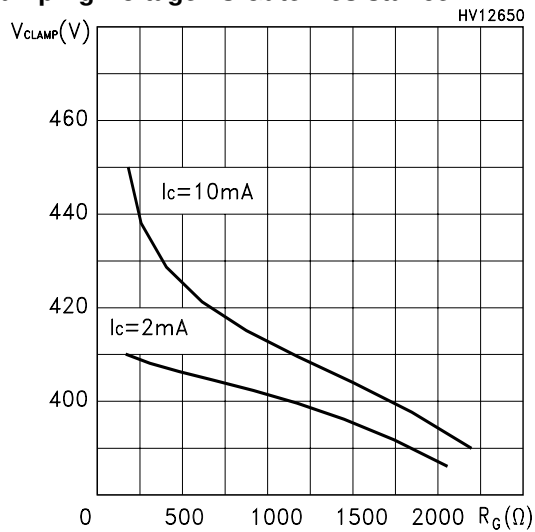


Fig. 1: Unclamped Inductive Load Test Circuit

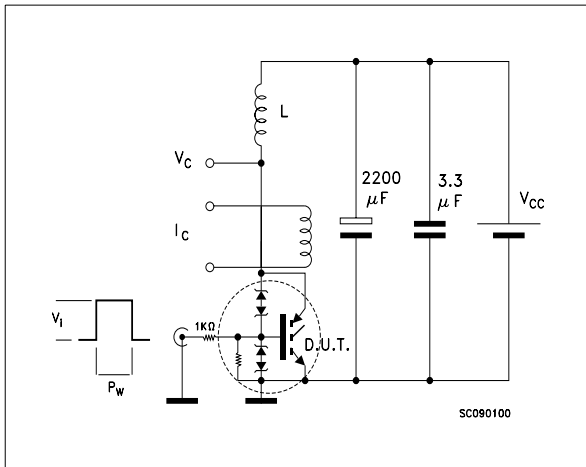


Fig. 2: Unclamped Inductive Waveform

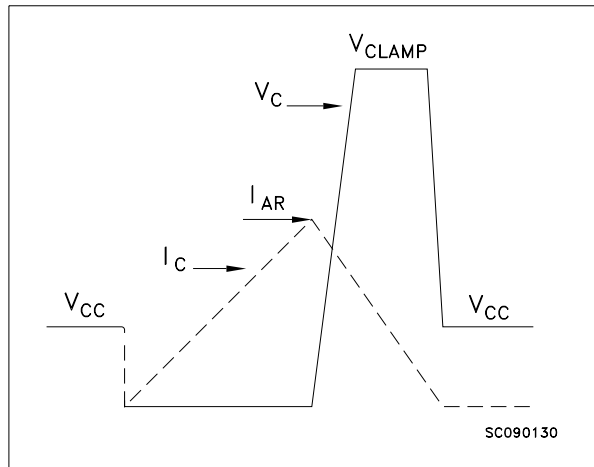


Fig. 3: Test Circuit For Inductive Load Switching And Diode Recovery Times

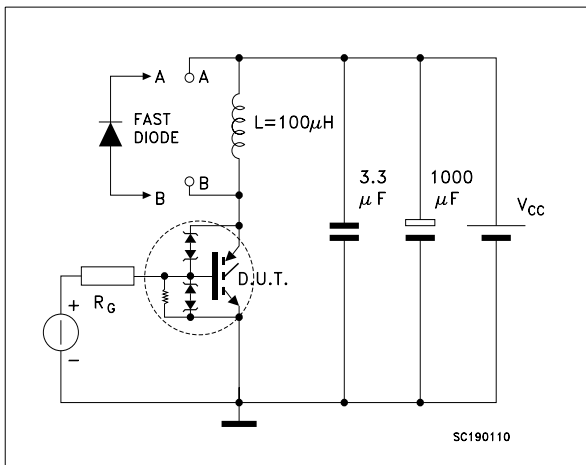
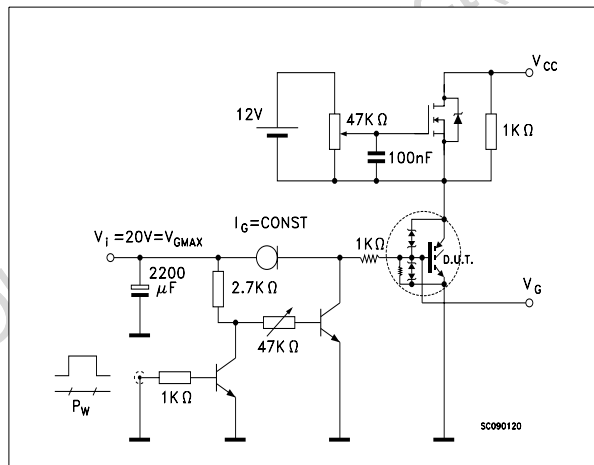


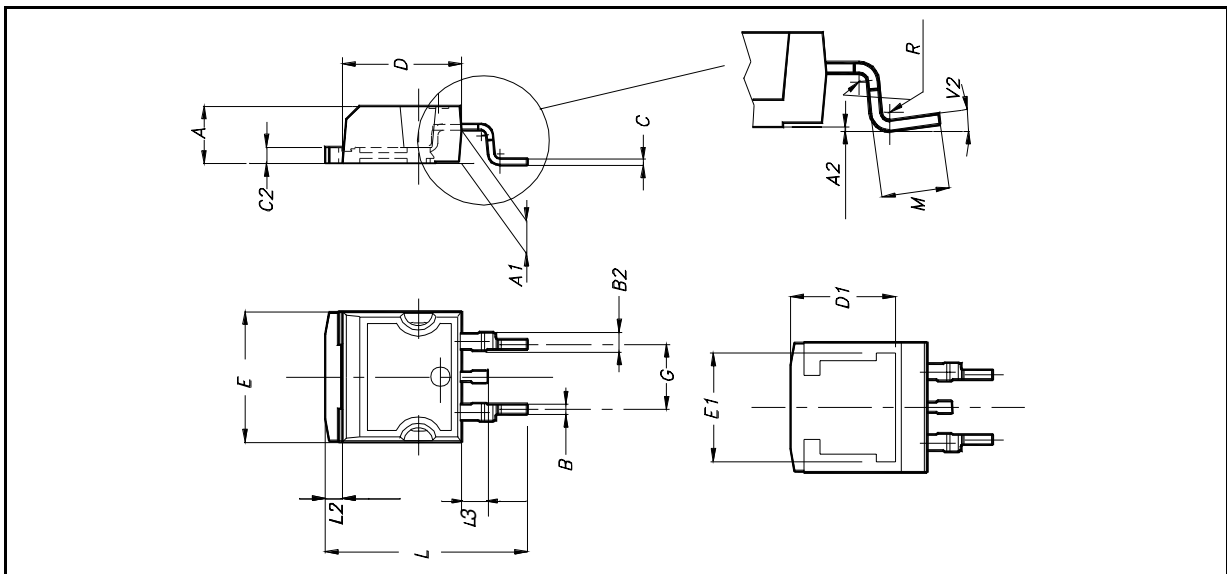
Fig. 4: Gate Charge test Circuit



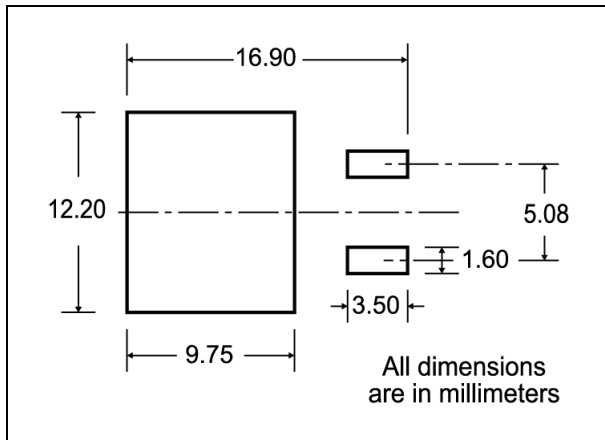
Obsolete Product

D²PAK MECHANICAL DATA

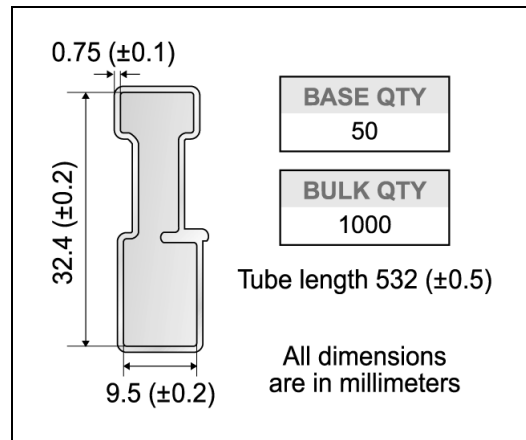
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	4.4		4.6	0.173		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.7		0.93	0.027		0.036
B2	1.14		1.7	0.044		0.067
C	0.45		0.6	0.017		0.023
C2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1		8			0.315	
E	10		10.4	0.393		
E1		8.5			0.334	
G	4.88		5.28	0.192		0.208
L	15		15.85	0.590		0.625
L2	1.27		1.4	0.050		0.055
L3	1.4		1.75	0.055		0.068
M	2.4		3.2	0.094		0.126
R		0.4			0.015	
V2	0°		8°			



D²PAK FOOTPRINT



TUBE SHIPMENT (no suffix)*



TAPE AND REEL SHIPMENT (suffix "T4")*

TAPE MECHANICAL DATA

DIM.	mm		inch	
	MIN.	MAX.	MIN.	MAX.
A0	10.5	10.7	0.413	0.421
B0	15.7	15.9	0.618	0.626
D	1.5	1.6	0.059	0.063
D1	1.59	1.61	0.062	0.063
E	1.65	1.85	0.065	0.073
F	11.4	11.6	0.449	0.456
K0	4.8	5.0	0.189	0.197
P0	3.9	4.1	0.153	0.161
P1	11.9	12.1	0.468	0.476
P2	1.9	2.1	0.075	0.082
R	50		1.574	
T	0.25	0.35	0.0098	0.0137
W	23.7	24.3	0.933	0.956

REEL MECHANICAL DATA

DIM.	mm		inch	
	MIN.	MAX.	MIN.	MAX.
A		330		12.992
B	1.5		0.059	
C	12.8	13.2	0.504	0.520
D	20.2		0.795	
G	24.4	26.4	0.960	1.039
N	100		3.937	
T		30.4		1.197

BASE QTY	1000
BULK QTY	1000

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