

N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^a	Q _g (TYP.)
100	0.0260 at V _{GS} = 10 V	35	31 nC
	0.0375 at V _{GS} = 7 V	31	

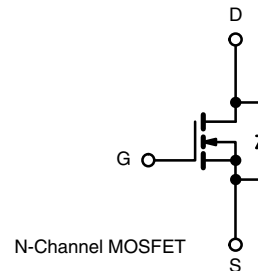
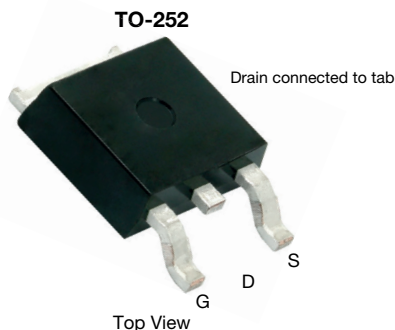
FEATURES

- TrenchFET® power MOSFET
- 100 % UIS tested
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912


RoHS
COMPLIANT

APPLICATIONS

- Primary side switch



Ordering Information:

SUD35N10-26P-E3 (lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS (T_A = 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 (T _J = 175 °C)	T _C = 25 °C	I _D	35	A
	T _C = 70 °C		32	
	T _A = 25 °C		12 ^{b, c}	
	T _A = 70 °C		10 ^{b, c}	
Pulsed Drain Current		I _{DM}	40	
Continuous Source-Drain Diode Current	T _C = 25 °C	I _S	50 ^e	
	T _A = 25 °C		6.9 ^{b, c}	
Avalanche Current Pulse		I _{AS}	33	mJ
Single Pulse Avalanche Energy		E _{AS}	55	
Maximum Power Dissipation	T _C = 25 °C	P _D	83	W
	T _C = 70 °C		58	
	T _A = 25 °C		8.3 ^{b, c}	
	T _A = 70 °C		5.8 ^{b, c}	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum Junction-to-Ambient ^{b, d}	t ≤ 10 s	R _{thJA}	15	18	°C/W
Maximum Junction-to-Case	Steady State	R _{thJC}	1.5	1.8	

Notes

- Based on T_C = 25 °C.
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under steady state conditions is 50 °C/W.
- Calculated based on maximum junction temperature. Package limitation current is 50 A.



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	100	-	-	V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA	-	165	-	mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J		-	-11	-	
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.5	-	4.4	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 55 °C	-	-	10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	40	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 12 A	-	0.0210	0.0260	Ω
		V _{GS} = 7 V, I _D = 8 A	-	0.0285	0.0375	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 12 A	-	25	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = 12 V, V _{GS} = 0 V, f = 1 MHz	-	2000	-	pF
Output Capacitance	C _{oss}		-	180	-	
Reverse Transfer Capacitance	C _{rss}		-	60	-	
Total Gate Charge	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 12 A	-	31	47	nC
Gate-Source Charge	Q _{gs}		-	10	-	
Gate-Drain Charge	Q _{gd}		-	9	-	
Gate Resistance	R _g	f = 1 MHz	-	1.5	-	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 50 V, R _L = 5 Ω I _D ≡ 10 A, V _{GEN} = 10 V, R _g = 1 Ω	-	10	15	ns
Rise Time	t _r		-	10	15	
Turn-Off Delay Time	t _{d(off)}		-	15	25	
Fall Time	t _f		-	10	15	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	-	-	50	A
Pulse Diode Forward Current ^a	I _{SM}		-	-	40	
Body Diode Voltage	V _{SD}	I _S = 10 A	-	0.8	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 10 A, di/dt = 100 A/μs, T _J = 25 °C	-	50	75	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	100	150	nC
Reverse Recovery Fall Time	t _a		-	38	-	ns
Reverse Recovery Rise Time	t _b		-	12	-	

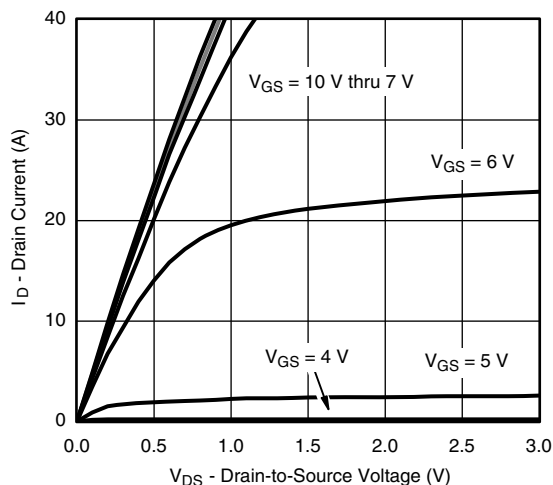
Note

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

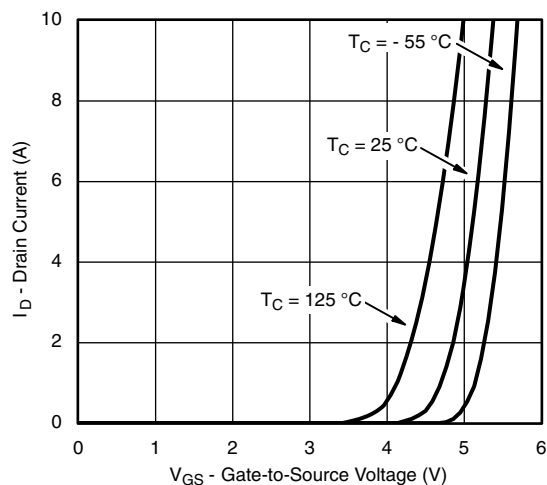
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



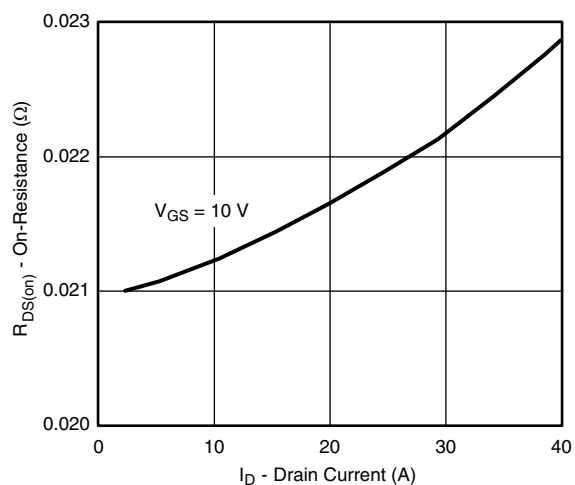
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



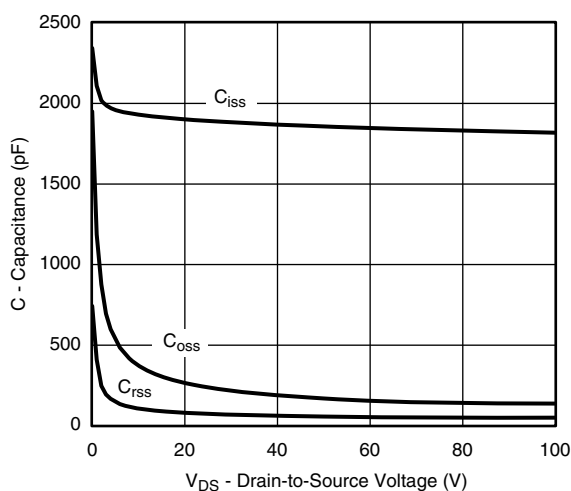
Output Characteristics



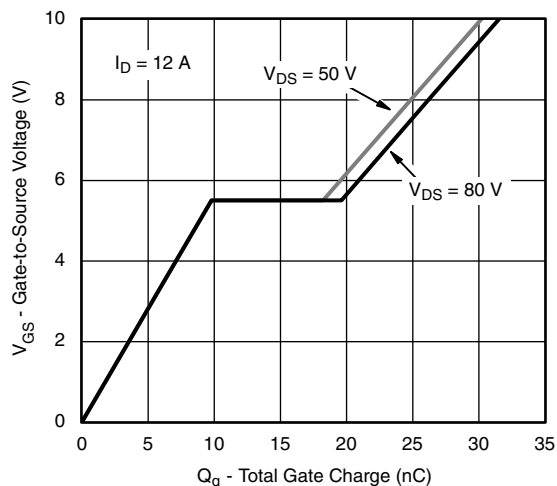
Transfer Characteristics



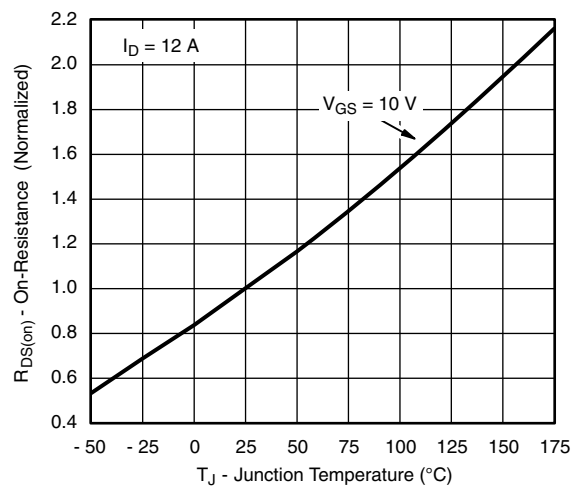
On-Resistance vs. Drain Current



Capacitance



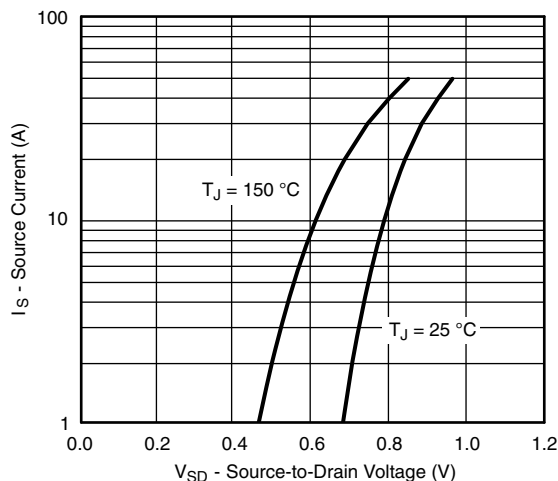
Gate Charge



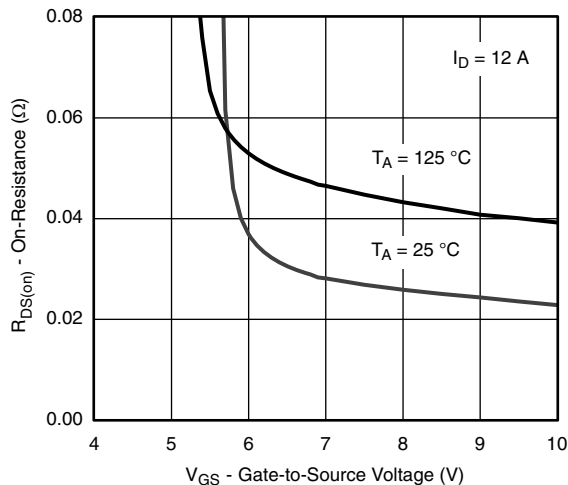
On-Resistance vs. Junction Temperature



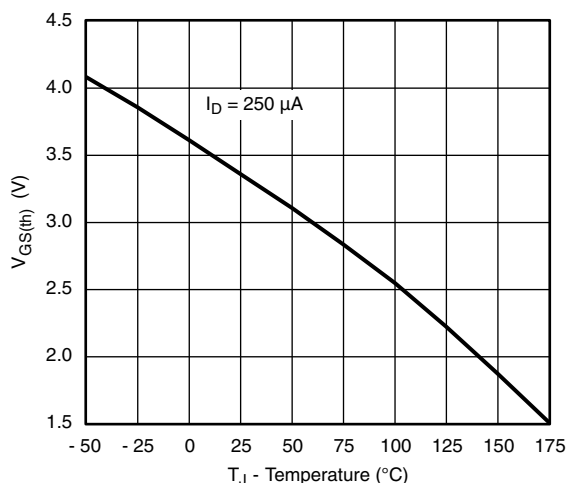
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



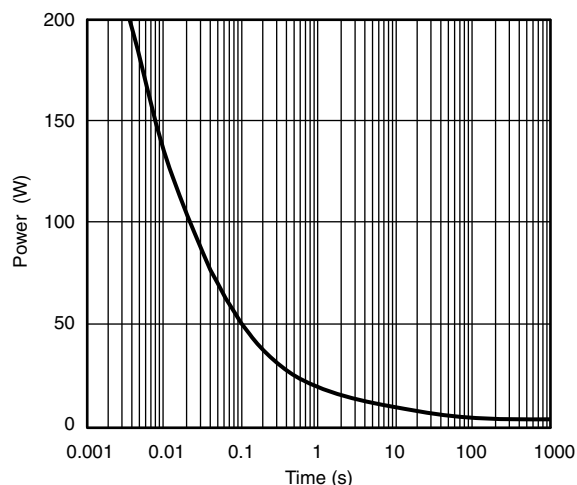
Source-Drain Diode Forward Voltage



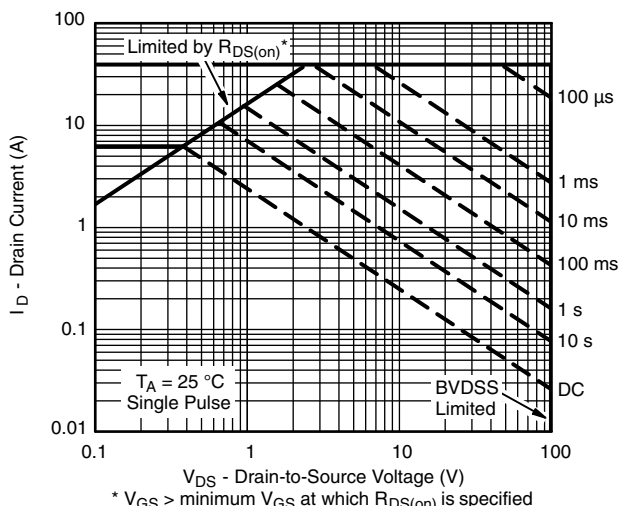
$R_{DS(on)}$ vs. V_{GS} vs. Temperature



Threshold Voltage



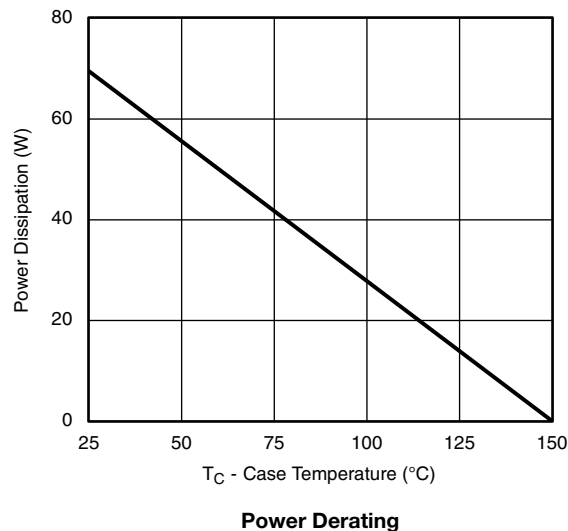
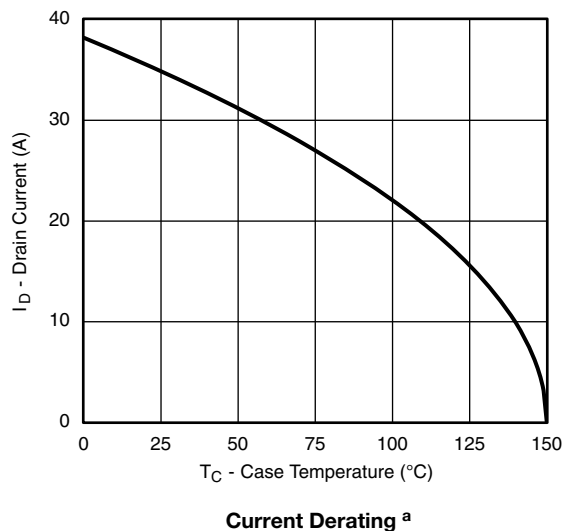
Single Pulse Power, Junction-to-Ambient



Safe Operating Area



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

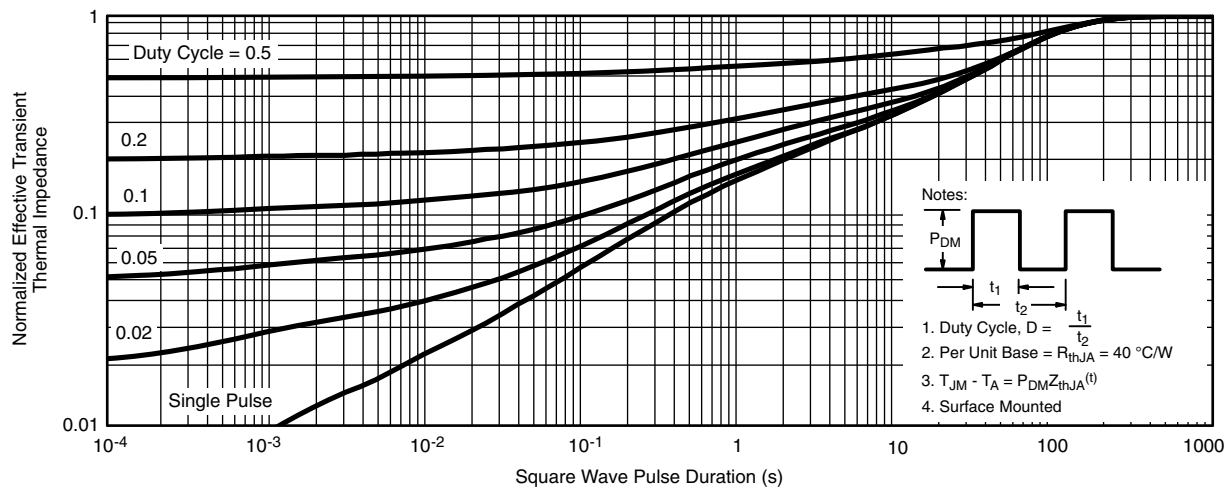


Note

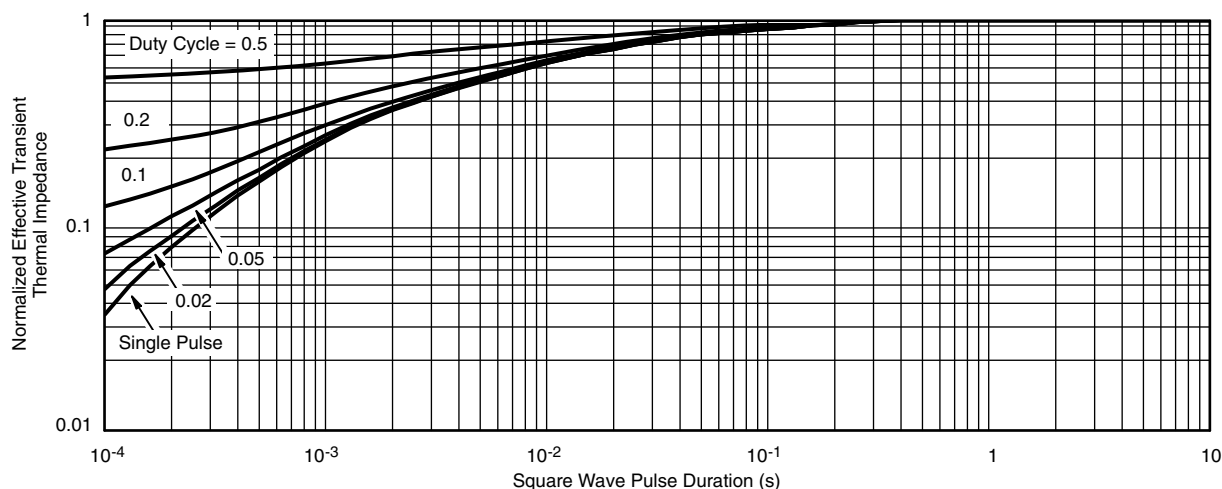
- a. The power dissipation P_D is based on T_J (max.) = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



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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TO-252AA Case Outline

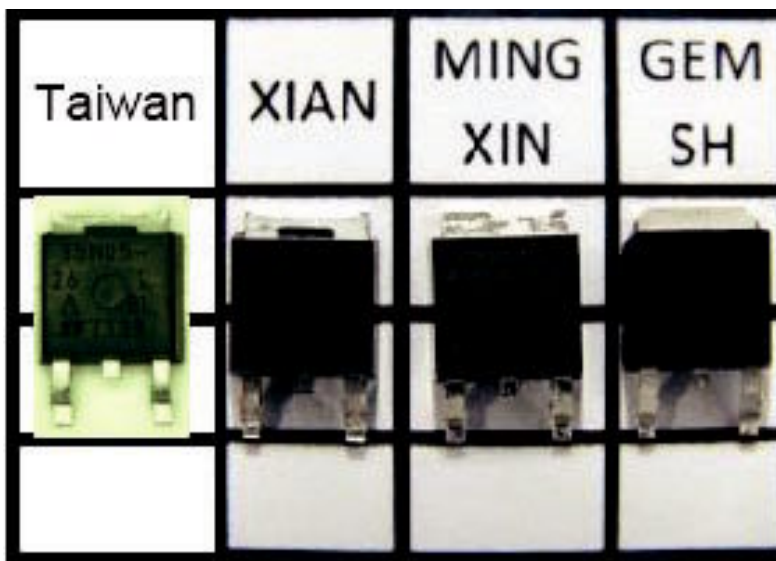


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	4.10	-	0.161	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	10.41	0.370	0.410
e	2.28 BSC		0.090 BSC	
e1	4.56 BSC		0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.01	1.52	0.040	0.060

ECN: T13-0359-Rev. O, 03-Jun-13
DWG: 5347

Notes

- Dimension L3 is for reference only.
- Xi'an, Mingxin, and GEM SH actual photo.



RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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