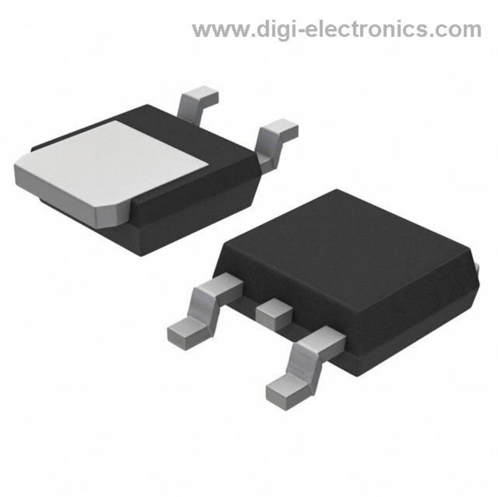
FDD86367-F085 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	FDD86367-F085-DG
Manufacturer	onsemi
Manufacturer Product Number	FDD86367-F085
Description	MOSFET N-CH 80V 100A DPAK
Detailed Description	N-Channel 80 V 100A (Tc) 227W (Tj) Surface Mount TO-252AA

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:	FDD86367-F085	Manufacturer:	onsemi
Series:	PowerTrench®	Product Status:	Active
FET Type:	N-Channel	Technology:	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	80 V	Current - Continuous Drain (Id) @ 25°C:	100A (Tc)
Drive Voltage (Max Rds On, Min Rds On):	10V	Rds On (Max) @ Id, Vgs:	4.2mOhm @ 80A, 10V
Vgs(th) (Max) @ Id:	4V @ 250μA	Gate Charge (Qg) (Max) @ Vgs:	88 nC @ 10 V
Vgs (Max):	±20V	Input Capacitance (Ciss) (Max) @ Vds:	4840 pF @ 40 V
FET Feature:	-	Power Dissipation (Max):	227W (Tj)
Operating Temperature:	-55°C ~ 175°C (TJ)	Grade:	Automotive
Qualification:	AEC-Q101	Mounting Type:	Surface Mount
Supplier Device Package:	TO-252AA	Package / Case:	TO-252-3, DPAK (2 Leads + Tab), SC-63
Base Product Number:	FDD86367		

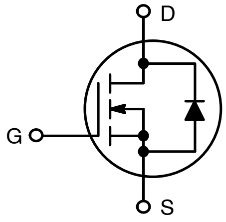
Environmental & Export classification

RoHS Status:	ROHS3 Compliant	Moisture Sensitivity Level (MSL):	1 (Unlimited)
REACH Status:	REACH Unaffected	ECCN:	EAR99
HTSUS:	8541.29.0095		

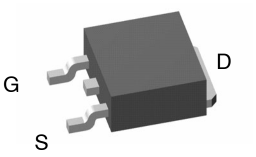
MOSFET – N-Channel, POWERTRENCH®

80 V, 100 A, 4.2 mΩ

FDD86367-F085



N−Channel



DPAK3 (TO−252 3 LD)
CASE 369AS

MARKING DIAGRAM

$Y&Z&3&K
FDD
86367

FDD86367	= Specific Device Code
$Y	= **onsemi** Logo
&Z	= Assembly Plant Code
&3	= 3−Digit Date Code
&K	= 2−Digits Lot Run Traceability Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

Features

- Typical $R_{DS(on)}$ = 3.3 mΩ at V_{GS} = 10 V, I_D = 80 A
- Typical $Q_{g(tot)}$ = 68 nC at V_{GS} = 10 V, I_D = 80 A
- UIS Capability
- AEC−Q101 Qualified and PPAP Capable
- This Device is Pb−Free, Halogen Free/BFR Free and is RoHS Compliant

Applications

- Automotive Engine Control
- PowerTrain Management
- Solenoid and Motor Drivers
- Integrated Starter/Alternator
- Primary Switch for 12 V Systems

MOSFET MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V_{DSS}	Drain−to−Source Voltage	80	V
V_{GS}	Gate−to−Source Voltage	±20	V
I_D	Drain Current − Continuous (V_{GS} = 10) (Note 1) T_C = 25°C	100	A
	Pulsed Drain Current T_C = 25°C	See Figure 4	
E_{AS}	Single Pulse Avalanche Energy (Note 2)	82	mJ
P_D	Power Dissipation	227	W
	Derate Above 25°C	1.52	W/°C
T_J, T_{STG}	Operating and Storage Temperature	−55 to +175	°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.66	°C/W
$R_{\theta JA}$	Maximum Thermal Resistance, Junction to Ambient (Note 3)	52	°C/W

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Current is limited by bondwire configuration.
2. Starting T_J = 25°C, L = 40 μH, I_{AS} = 64 A, V_{DD} = 80 V during inductor charging and V_{DD} = 0 V during time in avalanche.
3. $R_{\theta JA}$ is the sum of the junction−to−case and case−to−ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in^2 pad of 2oz copper.

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PACKAGE MARKING AND ORDERING INFORMATION

Device	Device Marking	Package	Reel Size	Tape Width	Shipping†
FDD86367−F085	FDD86367	DPAK3 (TO−252 3 LD) (Pb−Free)	13”	16 mm	2500 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Symbol	Parameter	Condition		Min	Typ	Max	Unit
OFF CHARACTERISTICS							
B_{VDSS}	Drain−to−Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V		80	–	–	V
I_{DSS}	Drain−to−Source Leakage Current	V_{DS} = 80 V, V_{GS} = 0 V	T_J = 25°C	–	–	1	μA
			T_J = 175°C (Note 4)	–	–	1	mA
I_{GSS}	Gate−to−Source Leakage Current	V_{GS} = ±20 V		–	–	±100	nA
ON CHARACTERISTICS							
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA		2	3	4	V
$R_{DS(on)}$	Drain to Source On Resistance	I_D = 80 A, V_{GS}= 10 V	T_J = 25°C	–	3.3	4.2	mΩ
			T_J = 175°C (Note 4)	–	6.6	8.4	mΩ
DYNAMIC CHARACTERISTICS							
C_{iss}	Input Capacitance	V_{DS} = 40 V, V_{GS} = 0 V, f = 1 MHz		–	4840	–	pF
C_{oss}	Output Capacitance			–	814	–	pF
C_{rss}	Reverse Transfer Capacitance			–	31	–	pF
R_g	Gate Resistance	V_{GS} = 0.5 V, f = 1 MHz		–	2.3	–	Ω
$Q_{g(ToT)}$	Total Gate Charge	V_{GS} = 0 to 10 V	V_{DD} = 40 V, I_D = 80 A	–	68	88	nC
$Q_{g(th)}$	Threshold Gate Charge	V_{GS} = 0 to 2 V		–	8.8	–	nC
Q_{gs}	Gate−to−Source Gate Charge	V_{DD} = 40 V, I_D = 80 A		–	22	–	nC
Q_{gd}	Gate−to−Drain “Miller“ Charge			–	14	–	nC
SWITCHING CHARACTERISTICS							
t_{on}	Turn−On Time	V_{DD} = 40 V, I_D = 80 A, V_{GS} = 10 V, R_{GEN} = 6 Ω		–	–	104	ns
$t_{d(on)}$	Turn−On Delay			–	20	–	ns
t_r	Rise Time			–	49	–	ns
$t_{d(off)}$	Turn−Off Delay			–	36	–	ns
t_f	Fall Time			–	16	–	ns
t_{off}	Turn−Off Time			–	–	80	ns
DRAIN−SOURCE DIODE CHARACTERISTICS							
V_{SD}	Source−to−Drain Diode Voltage	I_{SD} = 80 A, V_{GS} = 0 V		–	–	1.3	V
		I_{SD} = 40 A, V_{GS} = 0 V		–	–	1.2	V
t_{rr}	Reverse−Recovery Time	V_{DD} = 64 V, I_F = 80 A, dI_{SD}/dt = 100 A/μs		–	68	102	ns
Q_{rr}	Reverse−Recovery Charge			–	66	106	nC

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. The maximum value is specified by design at T_J = 175°C. Product is not tested to this condition in production.

TYPICAL CHARACTERISTICS

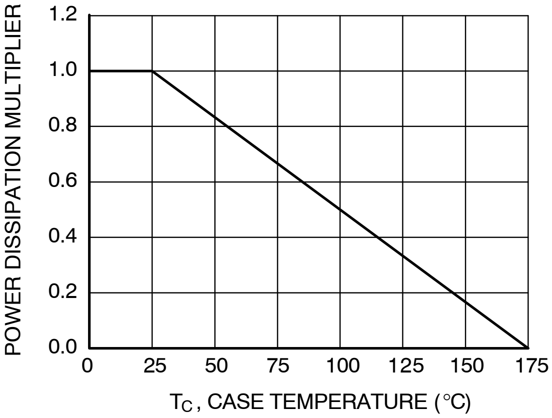


Figure 1. Normalized Power Dissipation vs. Case Temperature

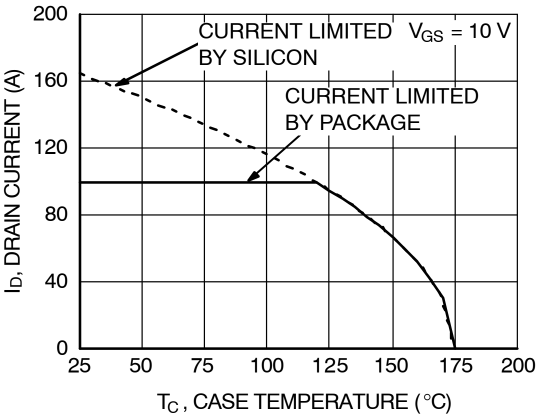


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

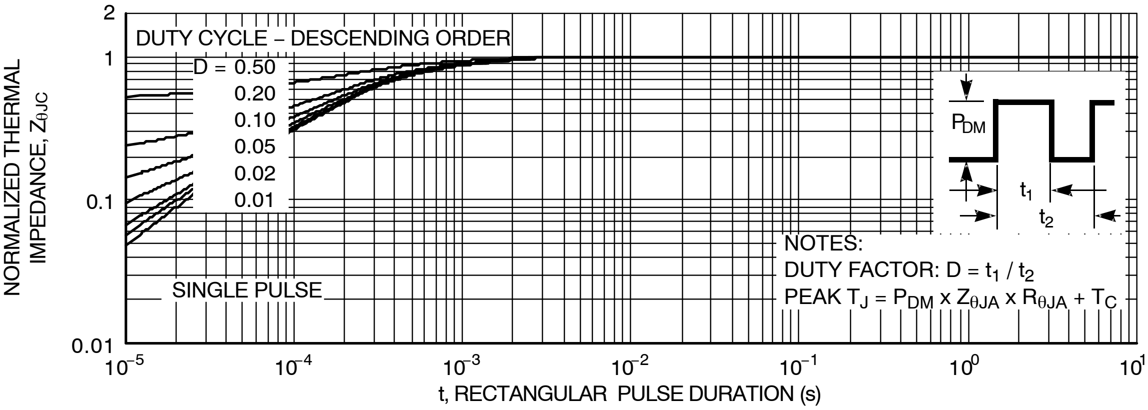


Figure 3. Normalized Maximum Transient Thermal Impedance

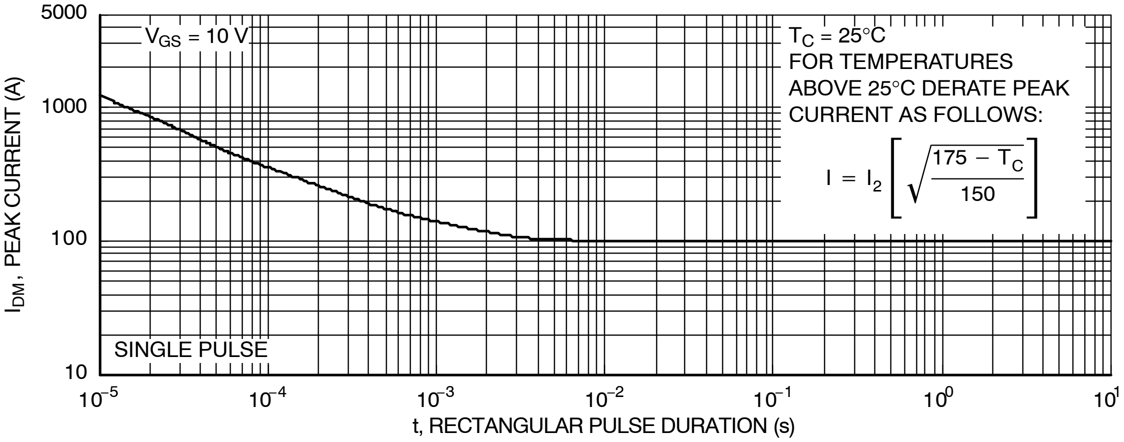


Figure 4. Peak Current Capability

TYPICAL CHARACTERISTICS (continued)

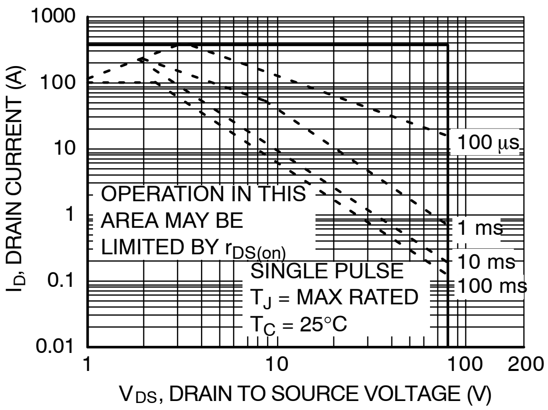
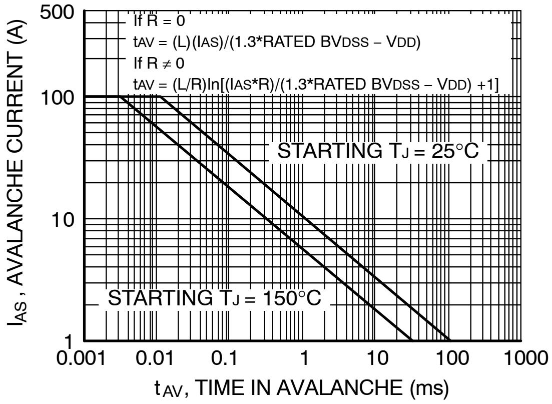


Figure 5. Forward Bias Safe Operating Area



NOTE: Refer to ON Application Notes AN7514 and AN7515

Figure 6. Unclamped Inductive Switching Capability

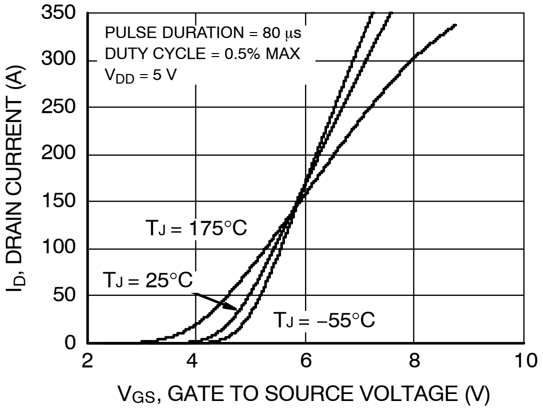


Figure 7. Transfer Characteristics

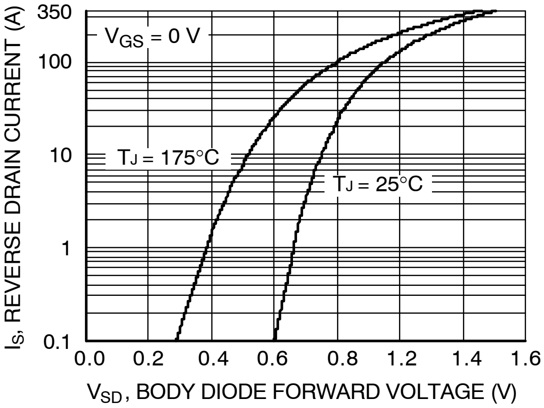


Figure 8. Forward Diode Characteristics

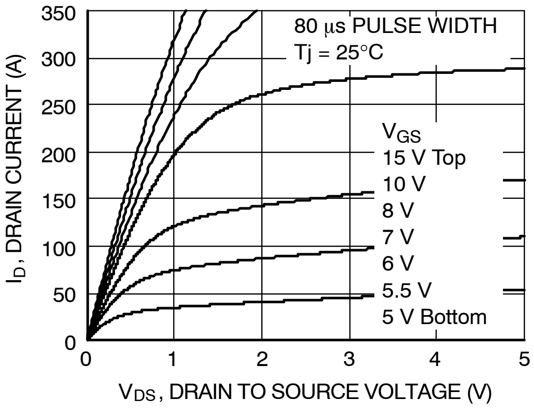


Figure 9. Saturation Characteristics

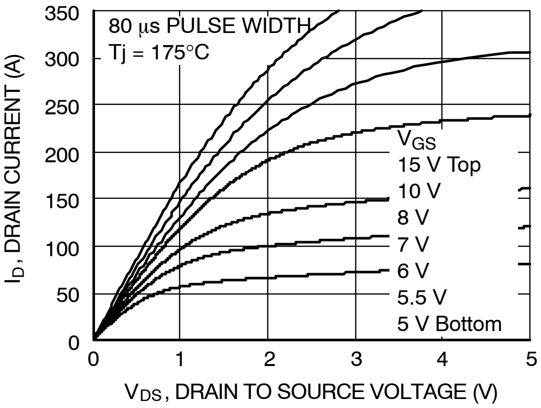


Figure 10. Saturation Characteristics

TYPICAL CHARACTERISTICS (continued)

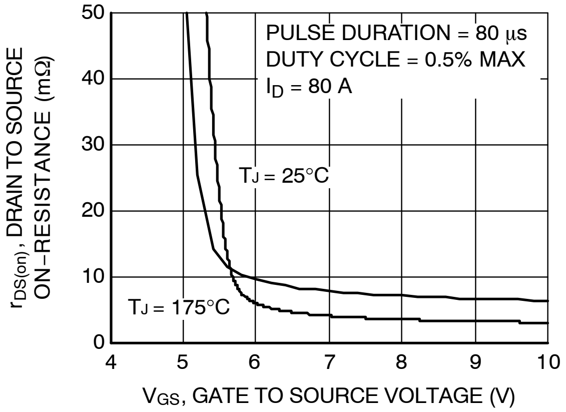


Figure 11. R_{DSON} vs. Gate Voltage

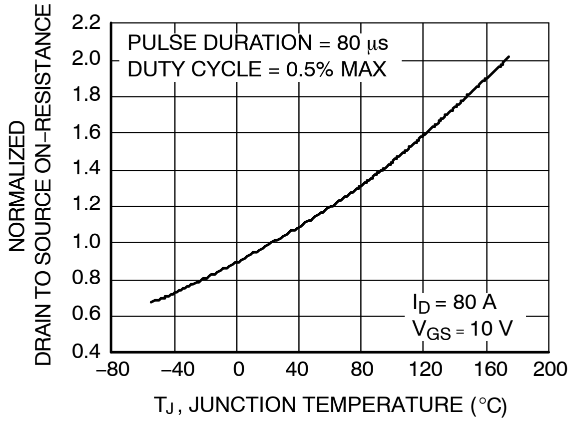


Figure 12. Normalized RDSON vs. Junction Temperature

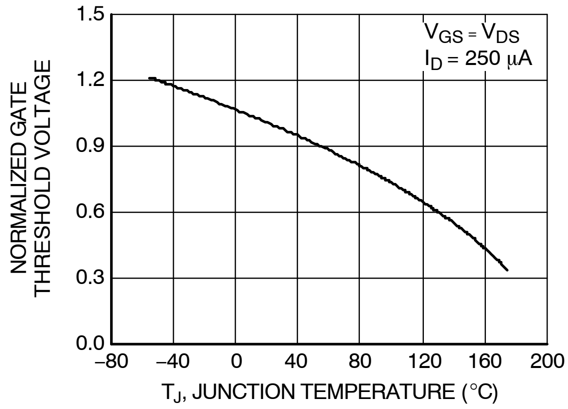


Figure 13. Normalized Gate Threshold Voltage vs. Temperature

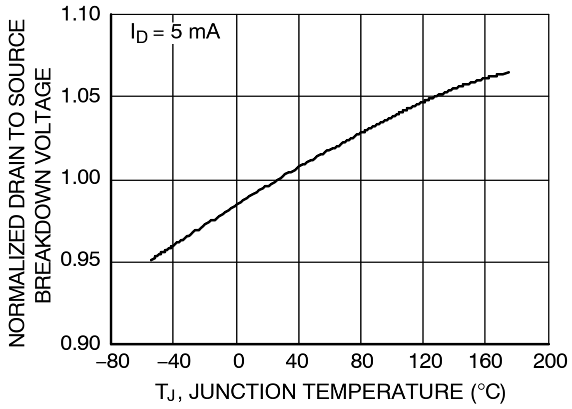


Figure 14. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature

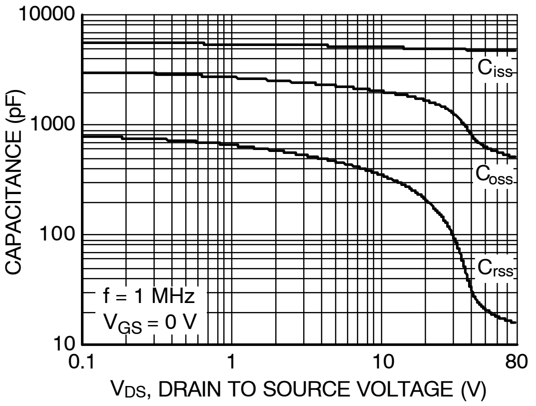


Figure 15. Capacitance vs. Drain to Source Voltage

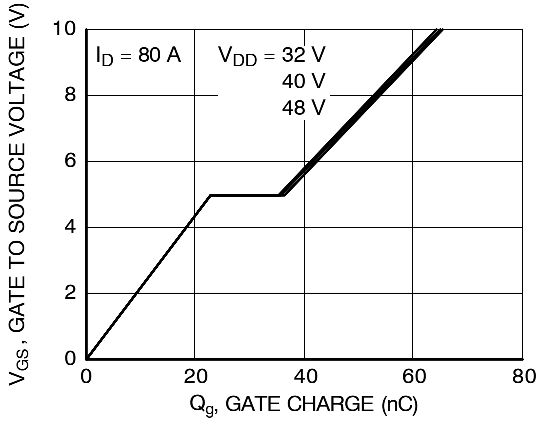


Figure 16. Gate Charge vs. Gate to Source Voltage

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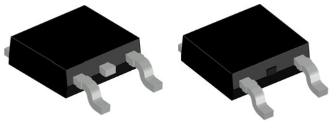
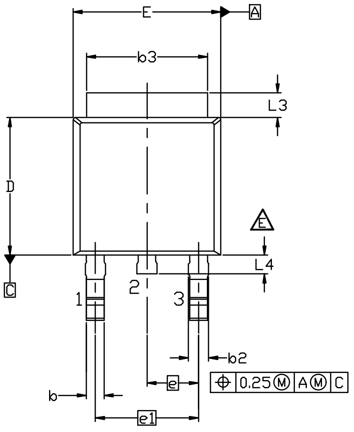
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

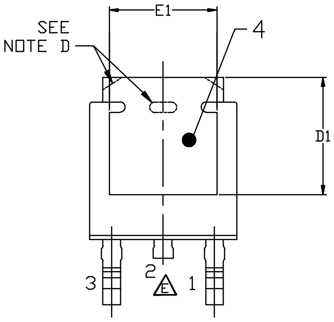


DPAK3 6.10x6.54x2.29, 4.57P
CASE 369AS
ISSUE B

DATE 20 DEC 2023



NON-DIODE PRODUCTS VERSION



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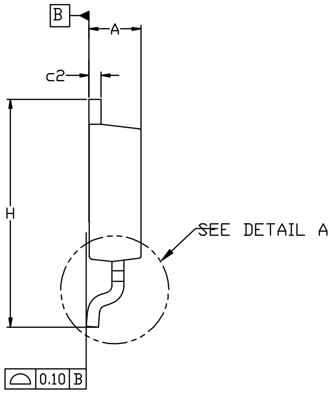
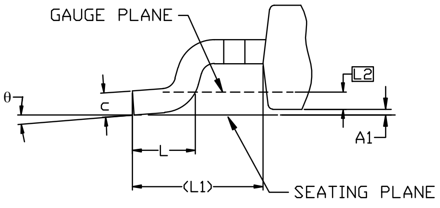
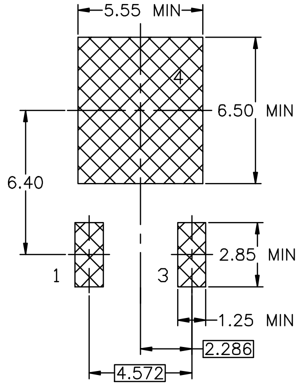


NOTES: UNLESS OTHERWISE SPECIFIED
A) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE F, VARIATION AA.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2018.
D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED CORNERS OR EDGE PROTRUSION.
E) FOR DIODE PRODUCTS, L4 IS 0.25 MM MAX PLASTIC BODY STUB WITHOUT CENTER LEAD.
F) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.



DETAIL A
(ROTATED -90°)
SCALE: 12X

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	2.18	2.29	2.39
A1	0.00	-	0.127
b	0.64	0.77	0.89
b2	0.76	0.95	1.14
b3	5.21	5.34	5.46
c	0.45	0.53	0.61
c2	0.45	0.52	0.58
D	5.97	6.10	6.22
D1	5.21	---	---
E	6.35	6.54	6.73
E1	4.32	---	---
e	2.286 BSC		
e1	4.572 BSC		
H	9.40	9.91	10.41
L	1.40	1.59	1.78
L1	2.90 REF		
L2	0.51 BSC		
L3	0.89	1.08	1.27
L4	---	---	1.02
θ	0°	---	10°



LAND PATTERN RECOMMENDATION

*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

GENERIC MARKING DIAGRAM*

XXXXXX
XXXXXX
AYWWZZ

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Assembly Lot Code

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DESCRIPTION:	**DPAK3 6.10x6.54x2.29, 4.57P**	**PAGE 1 OF 1**

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Hong Kong Special Administrative Region

ASA

MEMBERSHIP
Certificate

DIGI ELECTRONICS HK LIMITED

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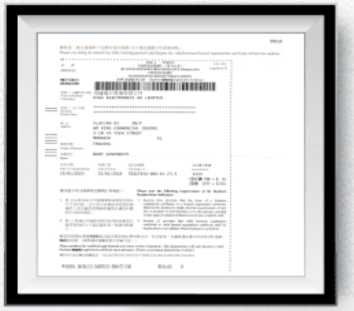
D-U-N-S® Registered™ Business



Tel: +00 852-30501935

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