

FMOSGTAB70N03-H

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FMOSGTAB70N03-H

70A 30V N-Channel Shield Gate Trench
Enhancement Mode Power MOSFET

Features

- $V_{DS}=30V$, $I_D=70A$.
- $R_{DS(ON)} \leq 5.5m\Omega$ @ $V_{GS}=10V$, $I_D=20A$.
- $R_{DS(ON)} \leq 8.0m\Omega$ @ $V_{GS}=4.5V$, $I_D=10A$.
- Improved dv/dt capability.
- Fast switching.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

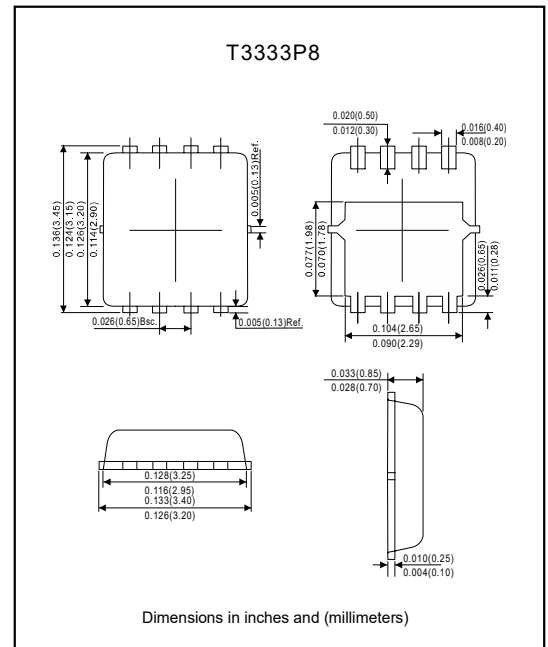
Application

- MB/ VGA/ Vcore.
- POL applications.
- SMPS 2nd SR.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic,T3333P8.
- Weight : Approximated 20mg.

Package outline

Maximum ratings (At $T_J=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current ($T_c=25^\circ C$)	I_D	70	A
($T_c=100^\circ C$)		30	
Pulsed drain current (Note 1)	I_{DM}	210	A
Power dissipation ($T_c=25^\circ C$)	P_D	40	W
(Derate above $25^\circ C$)		0.36	
Thermal resistance, junction to ambient	$R_{\theta JA}$	62	$^\circ C/W$
Thermal resistance, junction to case	$R_{\theta JC}$	2.8	
Operating junction temperature	T_J	+125	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

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Electrical characteristics (At $T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	BV_{DSS}	$I_D=250\mu A$, $V_{GS}=0V$	30			V
BV_{DSS} temperature coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C, $I_D=1mA$		0.04		V/°C
Zero gate voltage drain current	I_{DSS}	$V_{DS}=30V$, $V_{GS}=0V$			1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=125^\circ C$			10	
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V$, $V_{DS}=0V$			± 100	nA
On characteristics						
Gate threshold voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.0	1.5	2.5	V
$V_{GS(th)}$ temperature coefficient	$\Delta V_{GS(th)}$			-4		mV/°C
Static drain-source on-resistance (Note 3)	$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=20A$		3.8	5.5	mΩ
		$V_{GS}=4.5V$, $I_D=10A$		6.0	8.0	
Forward transconductance	g_{FS}	$V_{DS}=10V$, $I_D=10A$		23		S
Dynamic parameters						
Input capacitance	C_{iss}	$V_{GS}=0V$, $V_{DS}=25V$, $f=1.0MHz$		1210		pF
Output capacitance	C_{oss}			190		
Reverse transfer capacitance	C_{rss}			100		
Gate resistance	R_g	$V_{GS}=0V$, $V_{DS}=0V$, $f=1.0MHz$		2.5		Ω
Switching parameters (Note 3, 4)						
Total gate charge	Q_g	$V_{GS}=4.5V$, $V_{DS}=15V$, $I_D=20A$		11.1		nC
Gate to source charge	Q_{gs}			1.85		
Gate to drain charge	Q_{gd}			6.8		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=15V$, $V_{GS}=10V$, $R_G=3.3\Omega$, $I_D=15A$		7.5		ns
Turn-on rise time	t_r			14.5		
Turn-off delay time	$t_{d(off)}$			35.2		
Turn-off fall time	t_f			9.6		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 3)	V_{SD}	$I_S=1A$, $V_{GS}=0V$, $T_J=25^\circ C$			1.2	V
Maximum body-diode continuous current	I_S	$V_G=V_D=0V$, force current			70	A
Source current pulsed (Note 3)	I_{SM}				140	

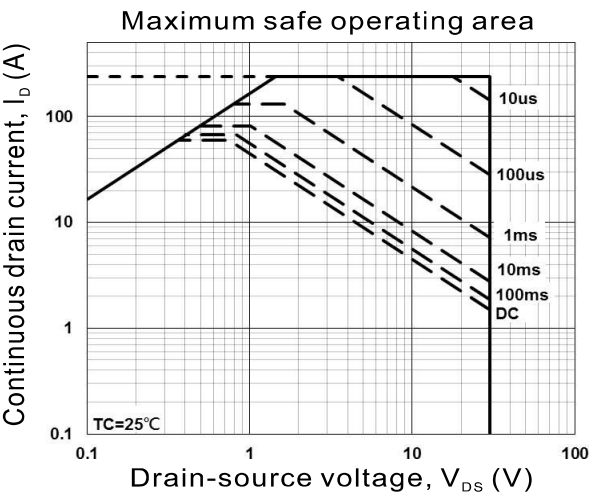
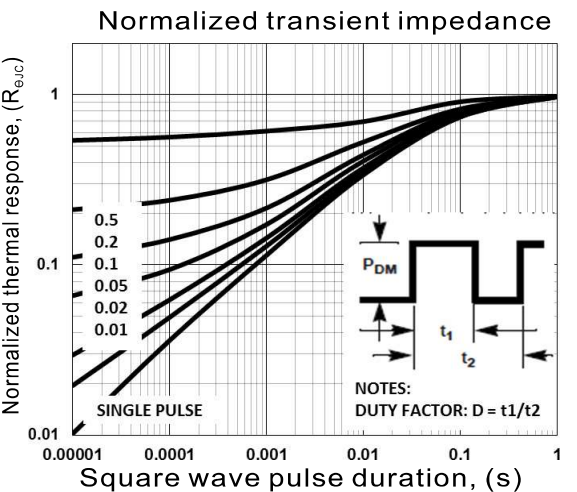
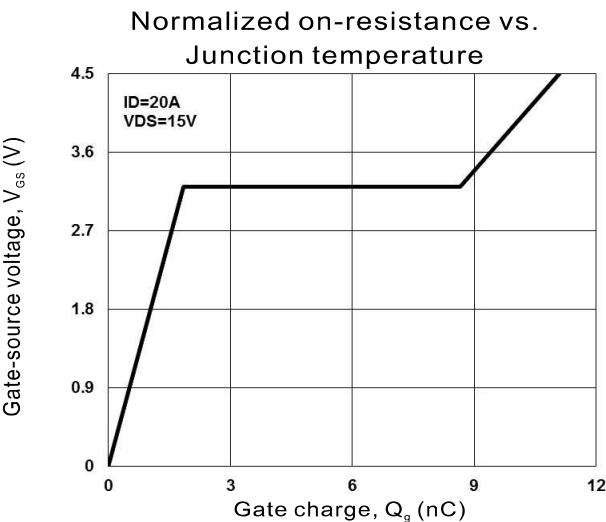
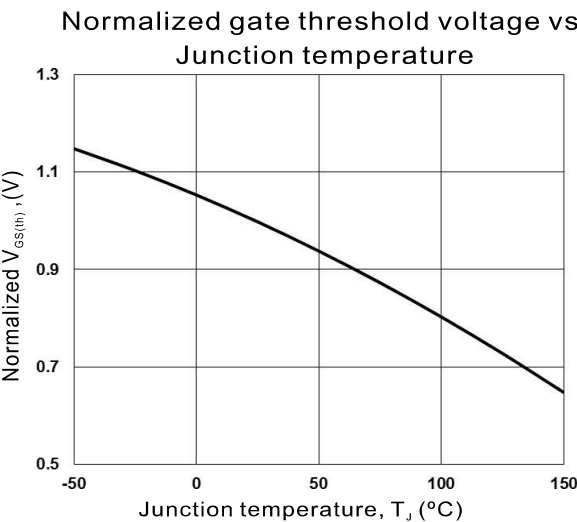
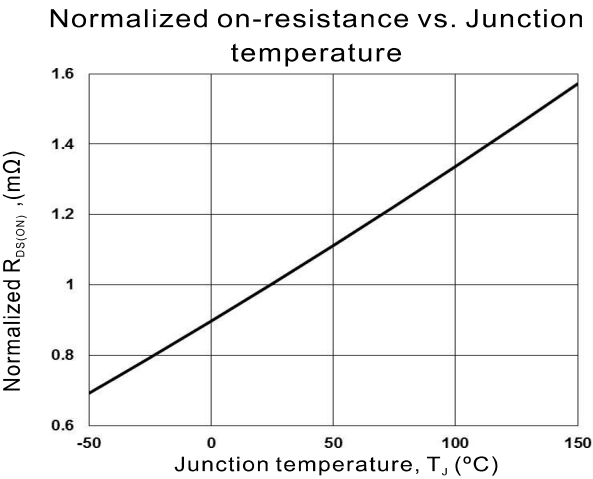
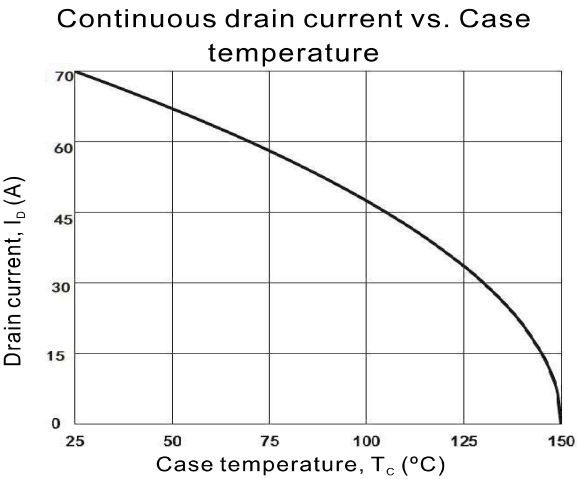
Notes : 1.Repetitive rating : Pulsed width limited by maximum junction temperature.

2. $V_{DD}=25\text{V}$, $V_{GS}=10\text{V}$, $R_g=25\Omega$, $L=0.1\text{mH}$, $I_{AS}=42\text{A}$, $T_J=25^{\circ}\text{C}$.3. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

4. Essentially independent of operating temperature.

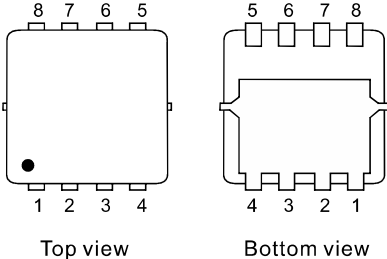
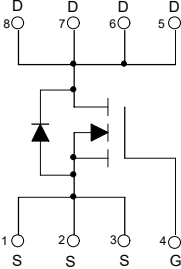
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Rating and characteristics curves



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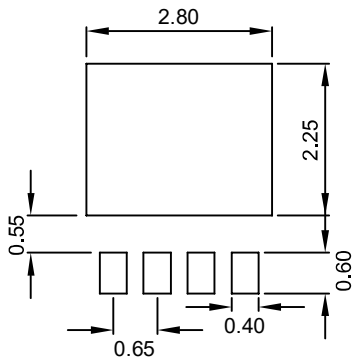
Pinning information

Pin	Simplified outline	Symbol
Pin 1, 2, 3 Source Pin 4 Gate Pin 5, 6, 7, 8 Drain	 Top view Bottom view	

Marking

Type number	Marking code
FMOSGTAB70N03-H	AB70N03

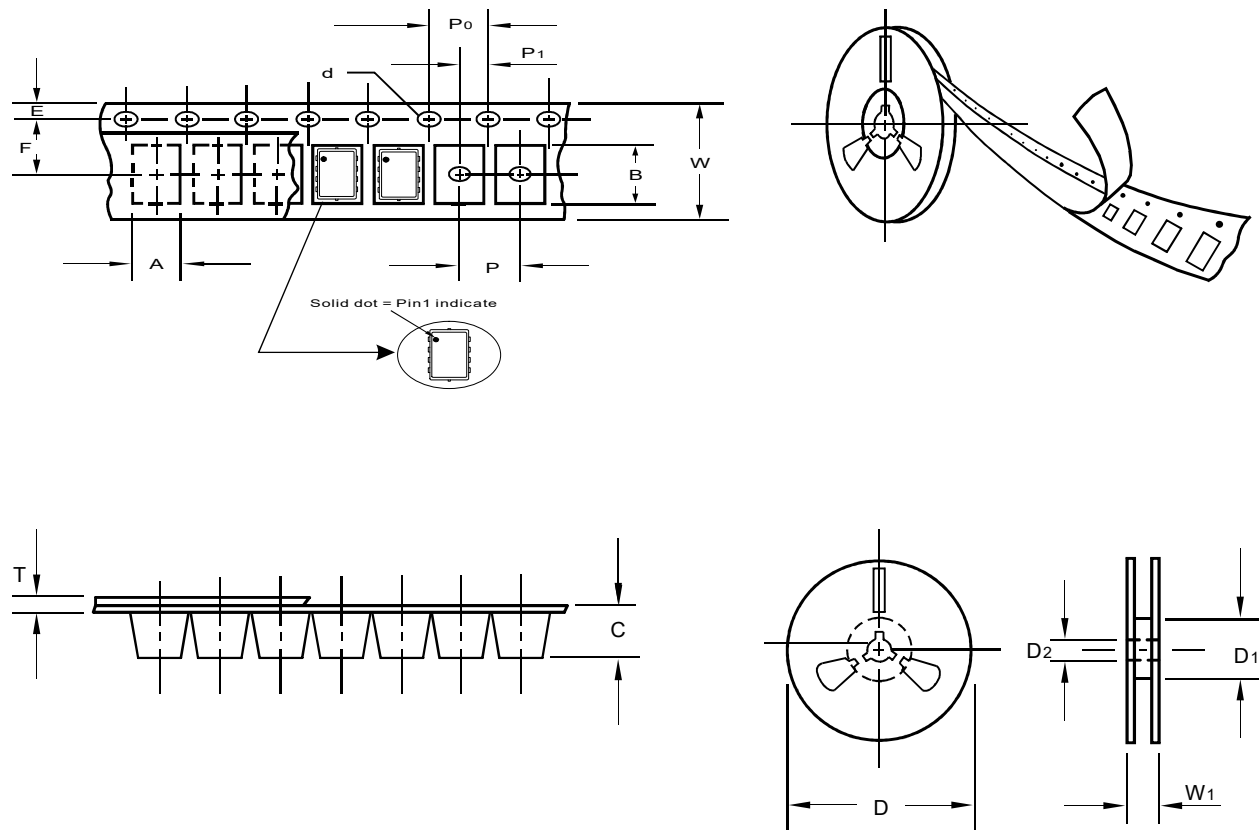
Suggested solder pad layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

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Packing information



unit:mm

Item	Symbol	Tolerance	T3333P8
Carrier width	A	0.1	3.55
Carrier length	B	0.1	3.55
Carrier depth	C	0.1	1.10
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	100.00
7" Reel outside diameter	D	2.0	-
7" Reel inner diameter	D1	min	-
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	12.00
Reel width	W1	1.0	17.60

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

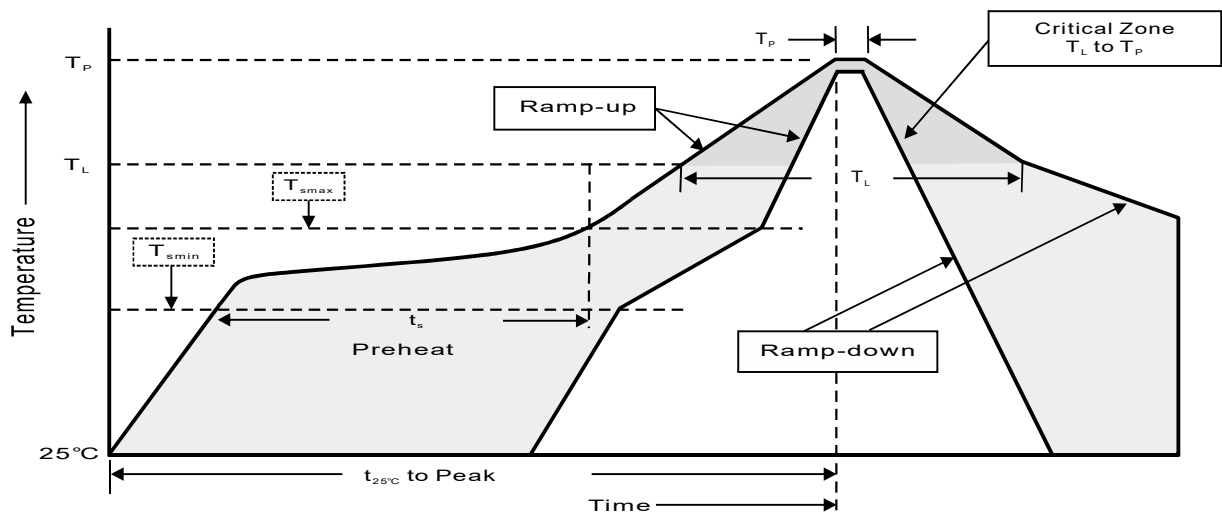
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
T3333P8	13"	5,000	8.0	10,000	355*335*38	330	350*330*360	80,000

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature = 5°C ~ 40°C Humidity = 55%, ±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile feature	Soldering condition
Average ramp-up rate (T_L to T_p)	< 3 °C/sec
Preheat - Temperature Min (T_{min}) - Temperature Max (T_{max}) - Time (Min to Max) (t_s)	150°C 200°C 60 ~ 120 sec
T_{smax} to T_L - Ramp-up rate	< 3 °C/sec
Time maintained above : - Temperature (T_L) - Time (T_L)	217°C 60 ~ 260 sec
Peak temperature (T_p)	255 °C -0/+5°C
Time with 5°C of actual peak temperature (T_p)	10 ~30 sec
Ramp-down rate	< 6 °C/sec
Time 25°C to peak temperature	< 6 minutes