

N-Channel Power MOSFET

FEATURES

- AEC-Q101 Qualified
- 100% UIS and Rg Tested
- RoHS Compliant
- Halogen-free

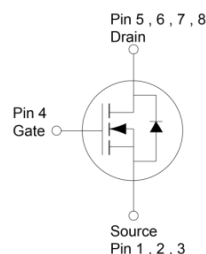
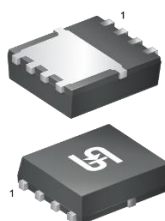
APPLICATIONS

- 12V Automotive Systems
- Solenoid and Motor Control
- Automotive Transmission Control
- DC-DC Converters

KEY PERFORMANCE PARAMETERS		
PARAMETER	VALUE	UNIT
V_{DS}	60	V
$R_{DS(on)}$ (max)	$V_{GS} = 10V$	30
	$V_{GS} = 7V$	36
Q_g	16	nC



PDFN33



Note: MSL 1 (Moisture Sensitivity Level) per J-STD-020

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	22	A
Pulsed Drain Current (Note 1)	I_{DM}	88	A
Total Power Dissipation	P_D	30	W
		6.1	
Total Power Dissipation	P_D	2.3	W
		0.5	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	27	mJ
Single Pulse Avalanche Current (Note 2)	I_{AS}	13.4	A
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to +150	$^\circ\text{C}$

THERMAL PERFORMANCE			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction to Case Thermal Resistance	$R_{\theta JC}$	4.1	$^\circ\text{C/W}$
Junction to Ambient Thermal Resistance (Note 3)	$R_{\theta JA}$	53	$^\circ\text{C/W}$

Notes:

1. Pulse Width $\leq 100\mu\text{s}$.
2. $L = 0.3\text{mH}$, $V_{GS} = 20\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.
3. Device on a PCB FR4 with 1 in² (single layer, 2 oz thickness) copper area for drain connection.

ELECTRICAL SPECIFICATIONS (T _A = 25°C unless otherwise noted)						
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static (Note 4)						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	BV _{DSS}	60	--	--	V
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	V _{GS(TH)}	1.8	2.6	3.8	V
Gate Body Leakage	V _{GS} = ±20V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V	I _{DSS}	--	--	1	μA
Drain-Source On-State Resistance	V _{GS} = 10V, I _D = 11A	R _{DS(on)}	--	25	30	mΩ
	V _{GS} = 7V, I _D = 11A		--	26	36	
Forward Transconductance	V _{DS} = 10V, I _D = 2.7A	g _{fs}	--	14	--	S
Dynamic (Note 5)						
Total Gate Charge	V _{DS} = 30V, I _D = 6A, V _{GS} = 10V	Q _g	--	16	--	nC
Gate-Source Charge		Q _{gs}	--	3.8	--	
Gate-Drain Charge		Q _{gd}	--	4.2	--	
Input Capacitance	V _{DS} = 30V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	975	--	pF
Output Capacitance		C _{oss}	--	80	--	
Reverse Transfer Capacitance		C _{rss}	--	18	--	
Gate Resistance	f = 1.0MHz	R _g	--	2.5	--	Ω
Switching (Note 6)						
Turn-On Delay Time	V _{DD} = 30V, R _G = 3.3Ω, I _D = 6A, V _{GS} = 10V	t _{d(on)}	--	7.9	--	ns
Turn-On Rise Time		t _r	--	19	--	
Turn-Off Delay Time		t _{d(off)}	--	18	--	
Turn-Off Fall Time		t _f	--	3.1	--	
Source-Drain Diode						
Forward Voltage (Note 4)	I _S = 11A, V _{GS} = 0V	V _{SD}	--	0.8	1.2	V
Reverse Recovery Time	I _S = 6A	t _{rr}	--	16	--	ns
Reverse Recovery Charge	dI _F /dt = 100A/μs	Q _{rr}	--	12	--	nC

Notes:

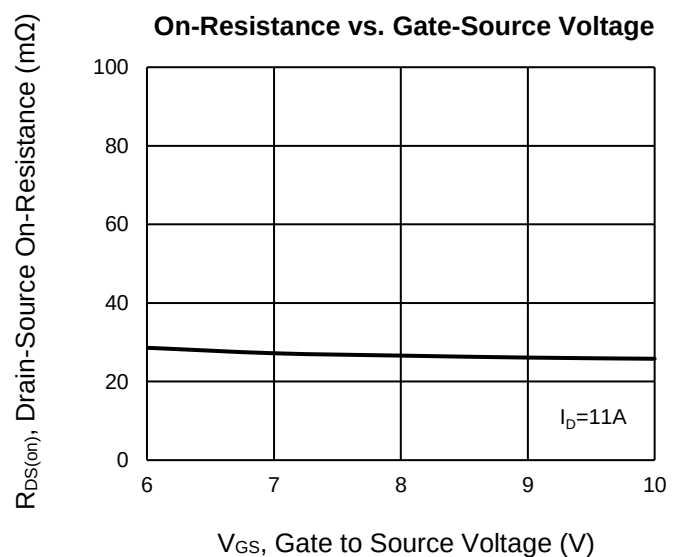
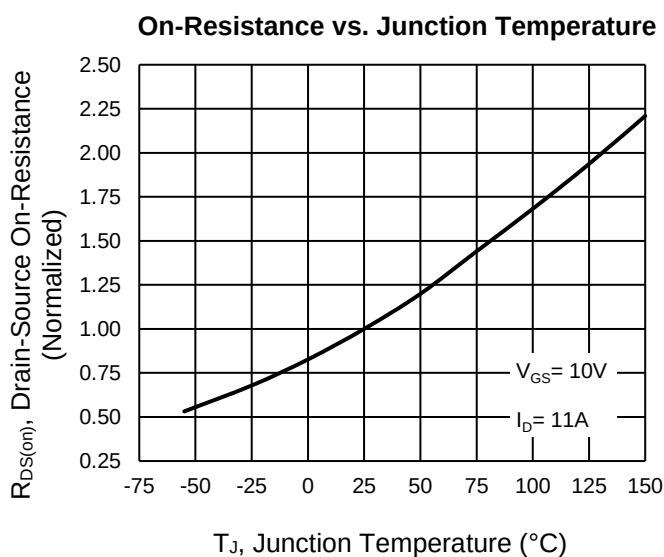
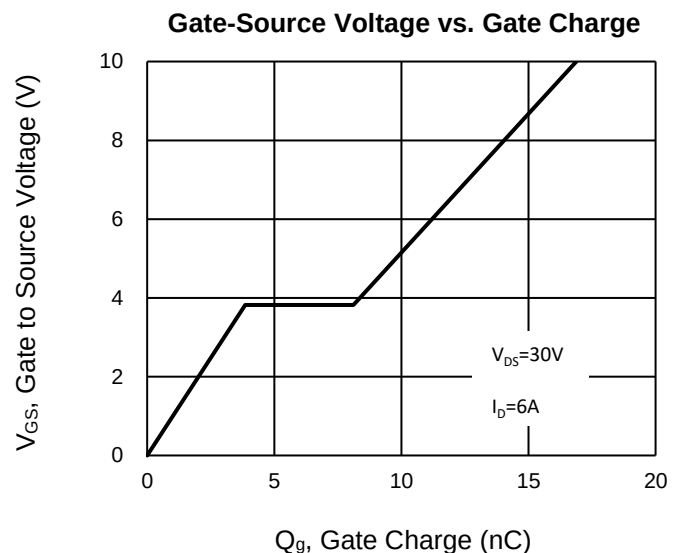
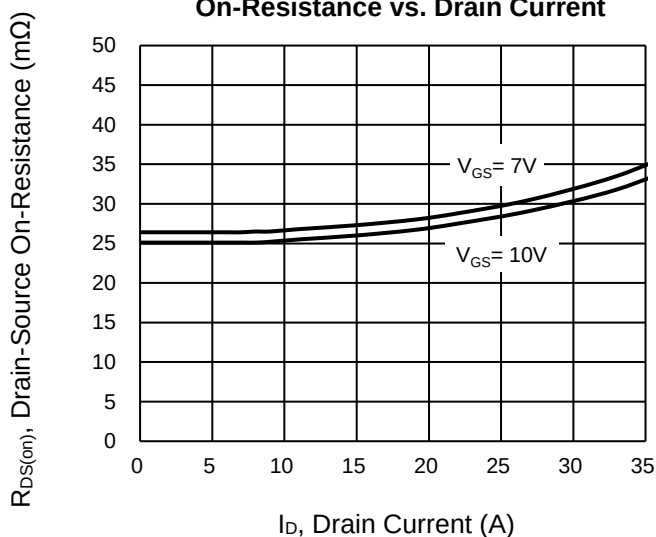
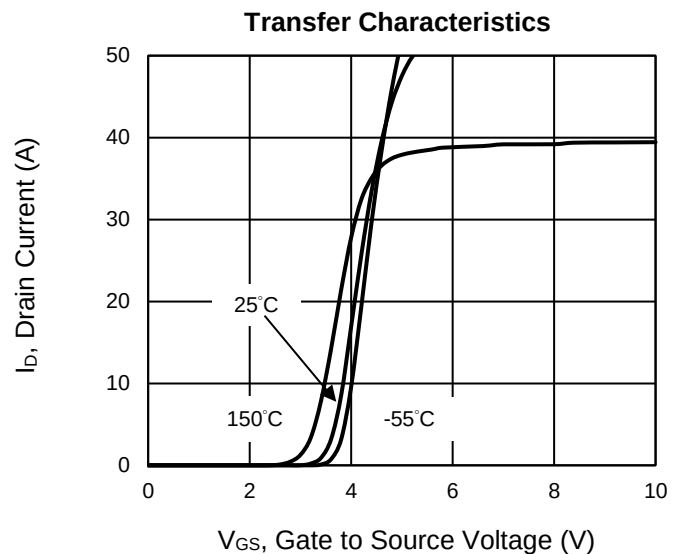
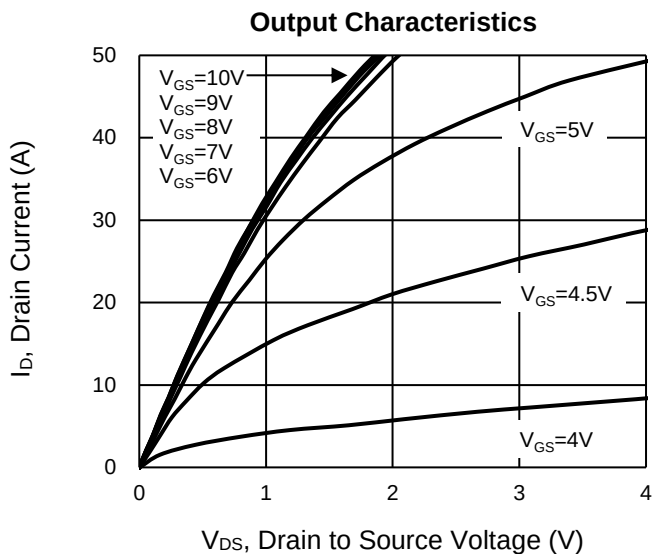
- Pulse test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- Defined by design. Not subject to production test.
- Switching time is essentially independent of operating temperature.

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
TQM300NB06CV RGG	PDFN33	5,000pcs / 13" Reel

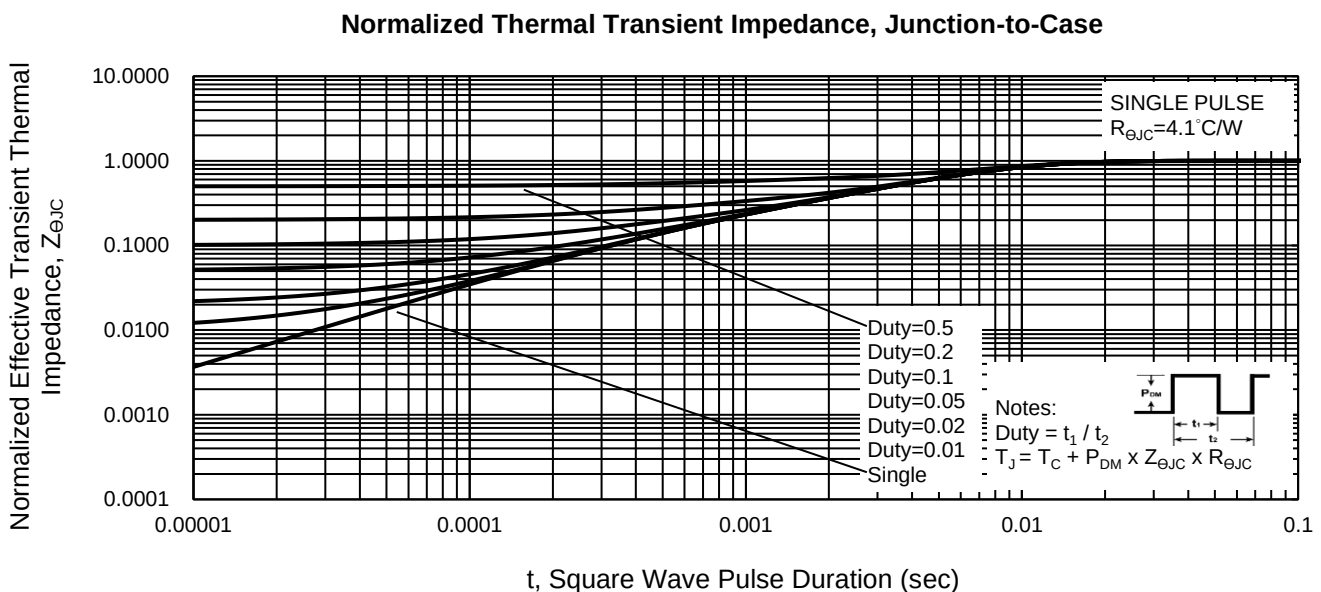
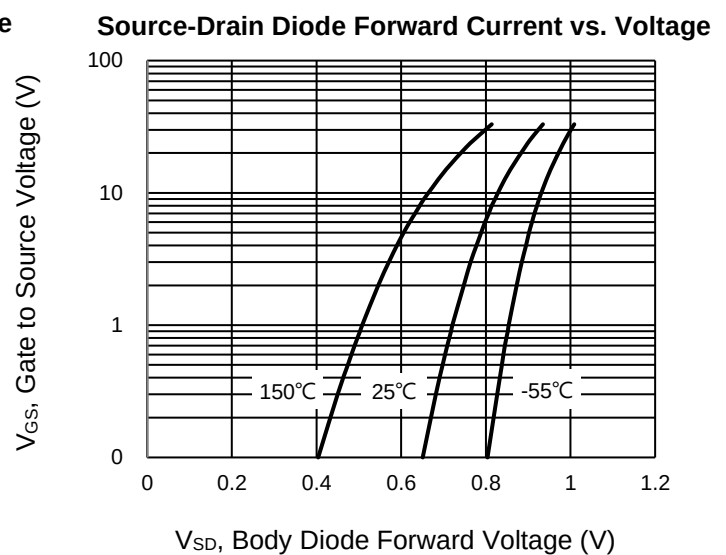
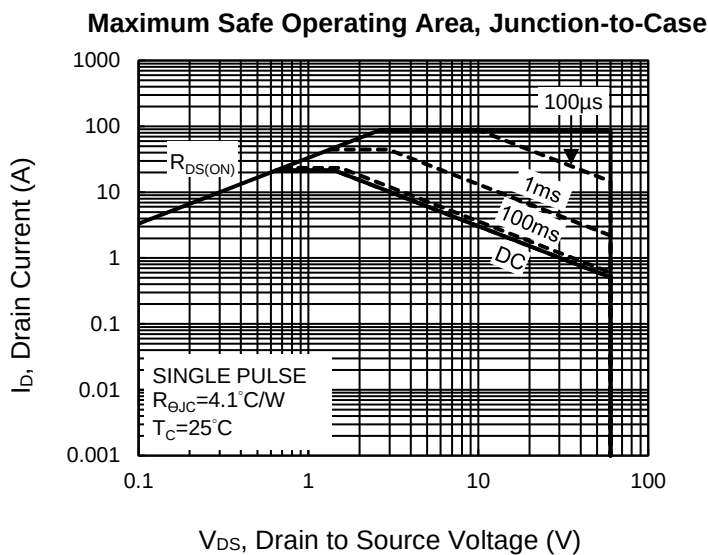
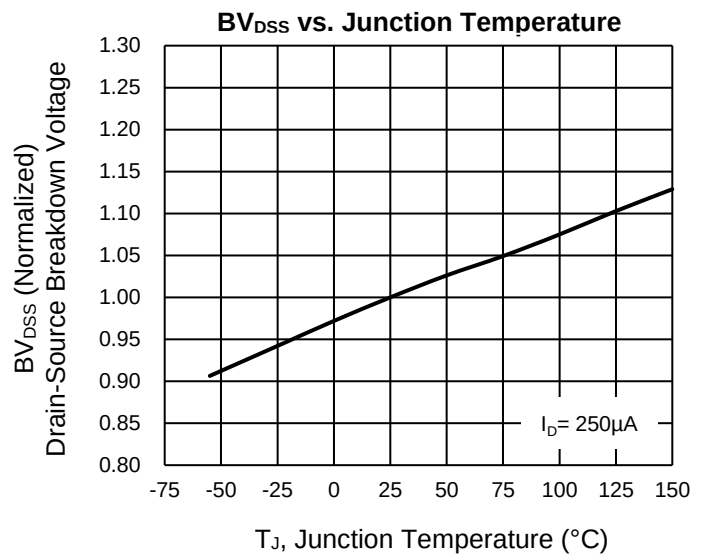
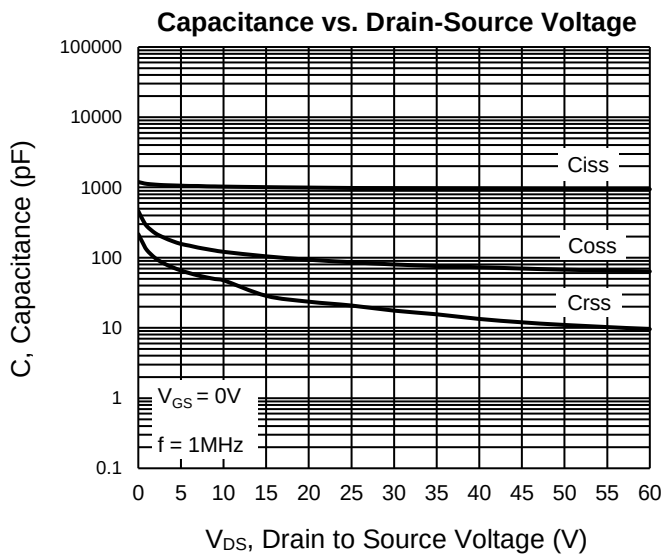
CHARACTERISTICS CURVES

($T_c = 25^\circ\text{C}$ unless otherwise noted)



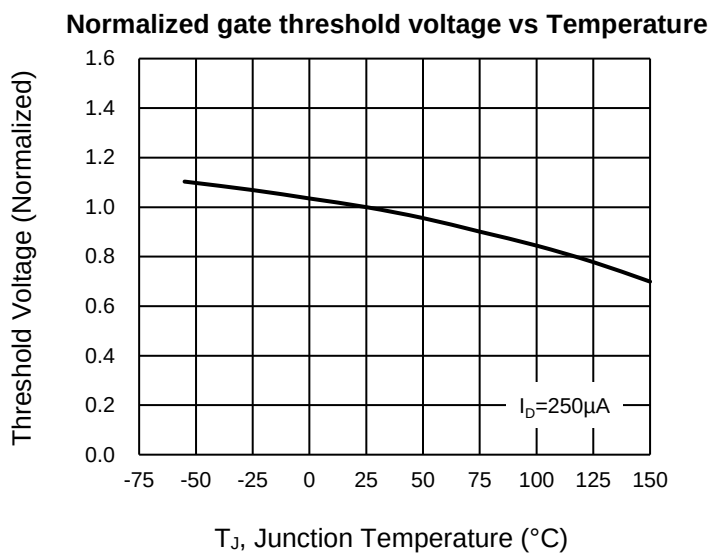
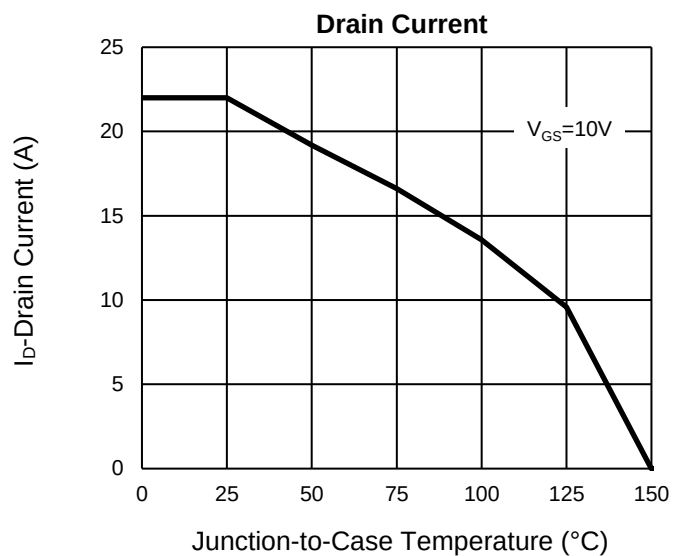
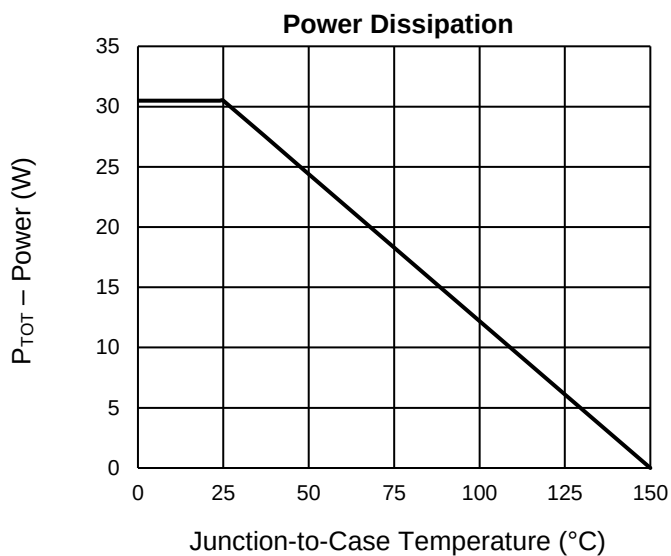
CHARACTERISTICS CURVES

($T_C = 25^\circ\text{C}$ unless otherwise noted)



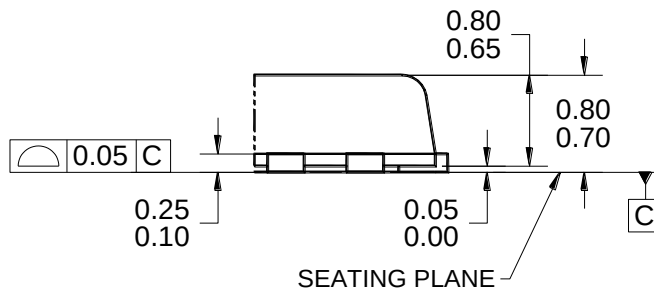
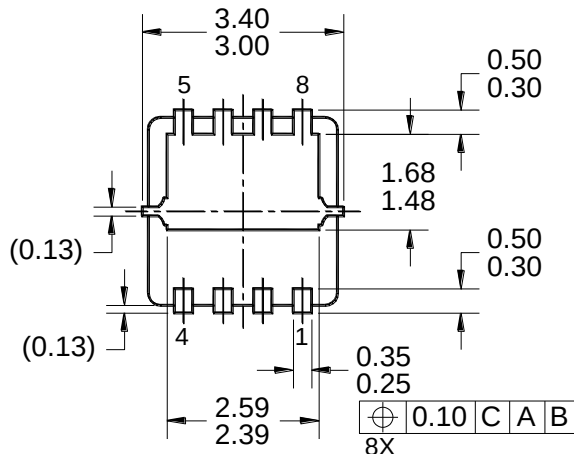
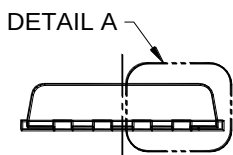
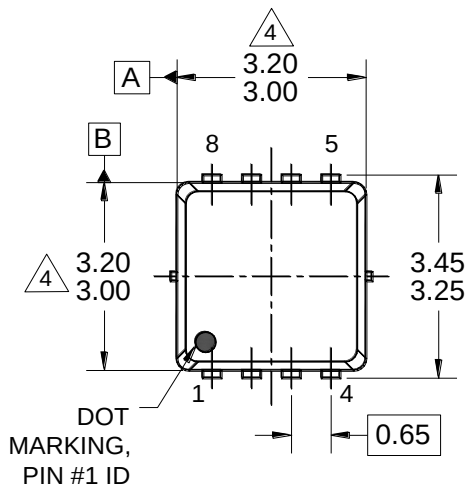
CHARACTERISTICS CURVES

($T_c = 25^\circ\text{C}$ unless otherwise noted)

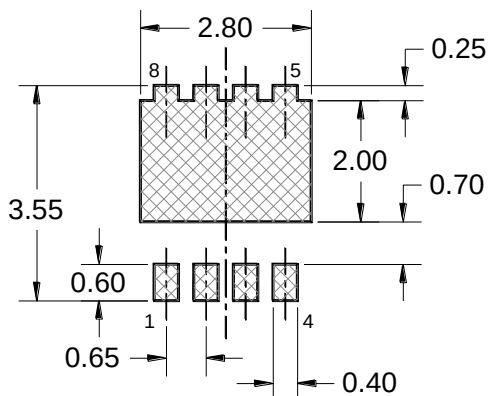


PACKAGE OUTLINE DIMENSIONS (Unit: Millimeters)

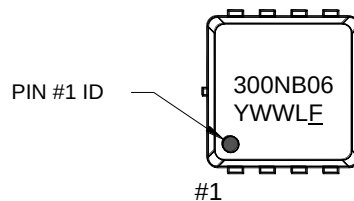
PDFN33



DETAIL A
(SCALE 2:1)



SUGGESTED PAD LAYOUT
(REFERENCE ONLY)



MARKING DIAGRAM

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: EIAJ SC-119.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-PDFN33R-121 REV A.

- Y = YEAR CODE
WW = WEEK CODE (01~52)
L = LOT CODE (1~9, A~Z)
F = FACTORY CODE
- = AEC-Q101 QUALIFIED

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Purchasers are solely responsible for the choice, selection, and use of TSC products and TSC assumes no liability for application assistance or the design of Purchasers' products.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.