

N-Ch and P-Ch Fast Switching MOSFET

$V_{DS}=20V, I_D=1.2A, R_{DS(ON)}=320m\Omega$

$V_{DS}=-20V, I_D=-1.0A, R_{DS(ON)}=580m\Omega$

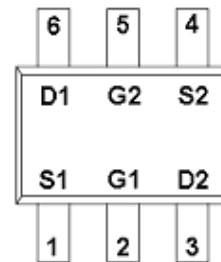
➤ General Description

This PAC2332EH N&P Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent $R_{ds(On)}$ performance and efficiency for power switching and load switching application., this device also comply with the RoHS and Green Product requirement with full function reliability approved.

➤ Feature

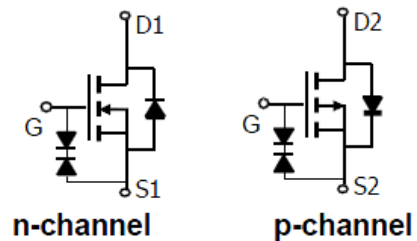
- Low Offset (Error) Voltage
- Low-Voltage Operation
- High-Speed Circuits
- ESD Protection
- Low Battery Voltage Operation
- SOT-363 package design

➤ SOT-363



➤ Application

- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Load/Power Switching Smart Phones, Pagers
- PA Switch
- Level Switch



➤ Absolute Maximum Ratings

Parameter	Symbol	Rating		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	V_{DSS}	20	-20	V	
Gate –Source Voltage	V_{GSS}	± 12	± 12	V	
Continuous Drain Current($T_J=150^\circ C$)	I_D	$T_A=25^\circ C$	1.2	-1.0	A
		$T_A=70^\circ C$	0.9	-0.7	
Pulsed Drain Current	I_{DM}	4	-3	A	
Continuous Source Current(Diode Conduction)	I_S	0.6	-0.6	A	
Power Dissipation	P_D	$T_A=25^\circ C$	0.3		W
		$T_A=70^\circ C$	0.2		
Operating Junction Temperature	T_J	-55/150		$^\circ C$	
Storage Temperature Range	T_{STG}	-55/150		$^\circ C$	

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➤ N-Channel Electrical Characteristics (T_J=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.3		1.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 1	mA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V$			1	uA
		$V_{DS}=16V, V_{GS}=0V$ $T_J=85^\circ C$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$	1.2			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=0.7A$		230	320	mΩ
		$V_{GS}=2.5V, I_D=0.6A$		280	420	
		$V_{GS}=1.8V, I_D=0.5A$		400	580	
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=1.0A$		1		S
Diode Forward Voltage	V_{SD}	$I_S=1.0A, V_{GS}=0V$		0.65	1.5	V
Dynamic						
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V$ $f=1MHz$		70		pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			8		
Total Gate Charge	Q_g	$V_{DS}=10V, V_{GS}=4.5V$ $I_D \equiv 1.2A$		1.06	1.38	nC
Gate-Source Charge	Q_{gs}			0.18		
Gate-Drain Charge	Q_{gd}			0.32		
Turn-On Time	$t_{d(on)}$	$V_{DD}=10V, R_L=20\Omega$ $I_D \equiv 1.2A, V_{GEN}=4.5V$ $R_G=1\Omega$		18	26	ns
	t_r			20	28	
Turn-Off Time	$t_{d(off)}$			70	110	
	t_f			25	40	

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➤ P-Channel Electrical Characteristics (T_J=25° C Unless otherwise noted)

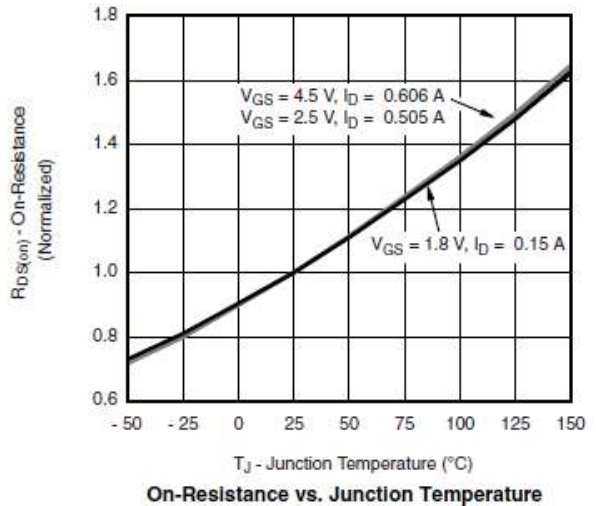
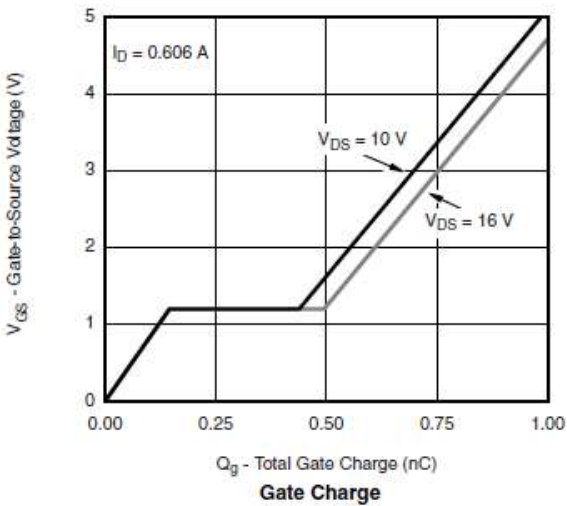
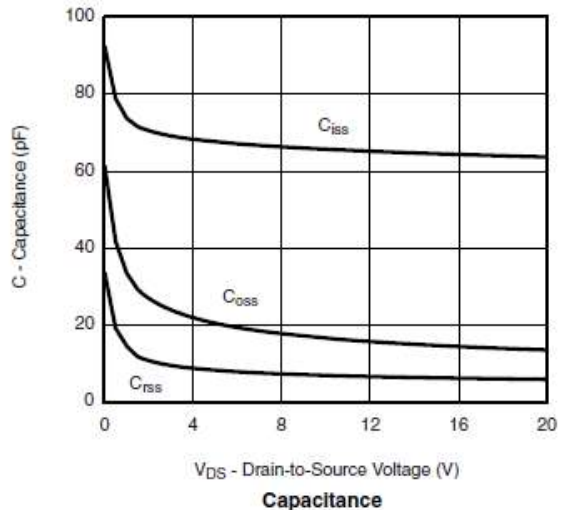
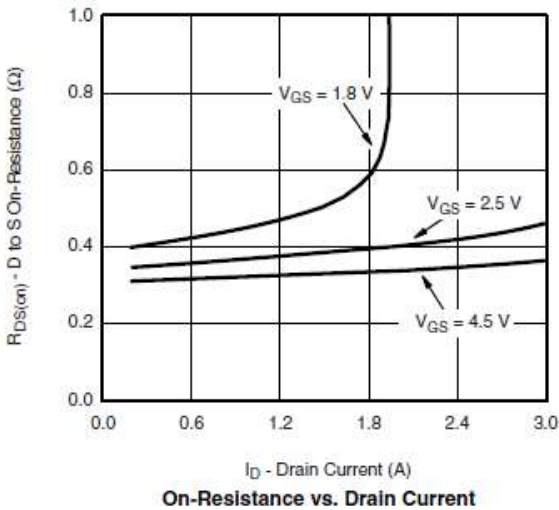
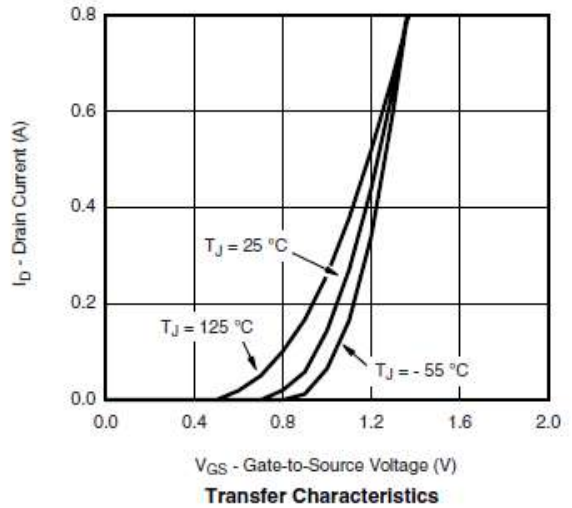
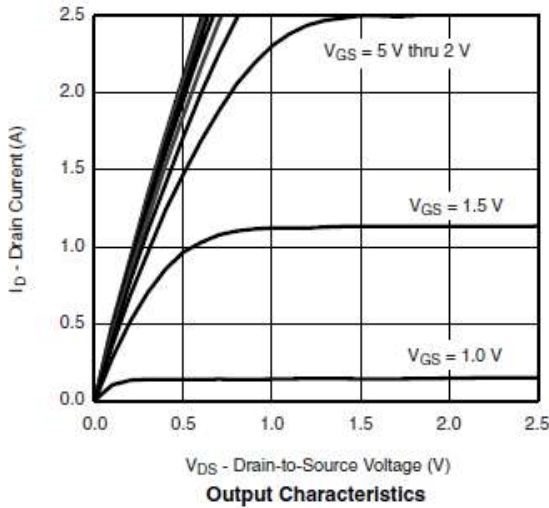
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.3		-1.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 1	mA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-16V, V_{GS}=0V$			-1	uA
		$V_{DS}=-16V, V_{GS}=0V$ $T_J=85^\circ C$			-5	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$	0.7			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-0.6A$		380	580	m Ω
		$V_{GS}=-2.5V, I_D=-0.5A$		520	780	
		$V_{GS}=-1.8V, I_D=-0.4A$		690	980	
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-0.4A$		1		S
Diode Forward Voltage	V_{SD}	$I_S=-0.15A, V_{GS}=0V$		0.65	1.5	V
Dynamic						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V$ $f=1MHz$		70	100	pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			10		
Total Gate Charge	Q_g	$V_{DS}=-10V, V_{GS}=-4.5V$ $I_D \equiv -0.25A$		1.0	1.3	nC
Gate-Source Charge	Q_{gs}			0.1		
Gate-Drain Charge	Q_{gd}			0.3		
Turn-On Time	$t_{d(on)}$	$V_{DD}=-10V, R_L=30\Omega$ $I_D \equiv -0.2A, V_{GEN}=-4.5V$ $R_G=10\Omega$		10	15	ns
	t_r			10	15	
Turn-Off Time	$t_{d(off)}$			40	60	
	t_f			30	50	

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➤ Typical Characteristics(N-Channel)

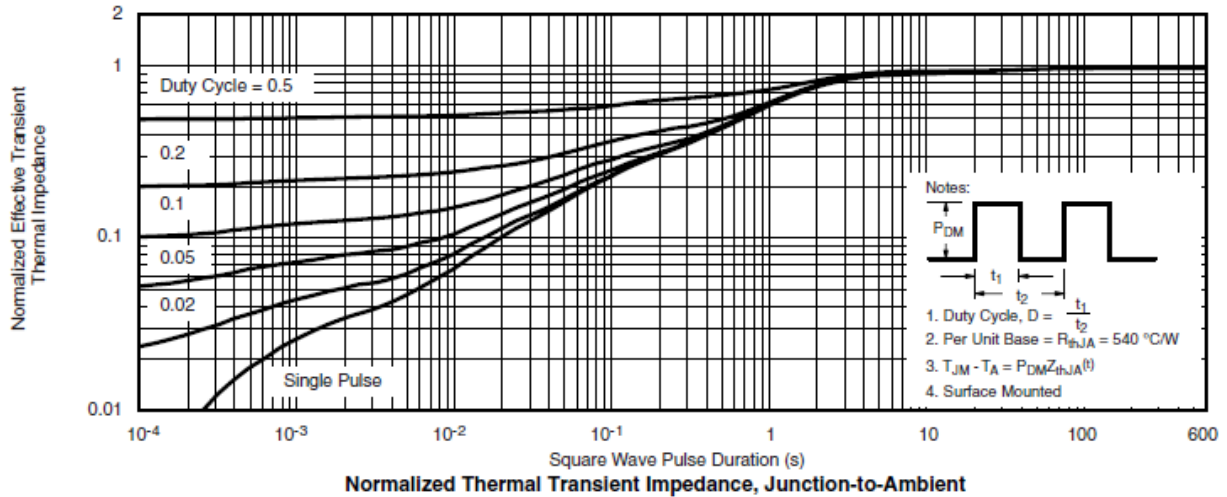
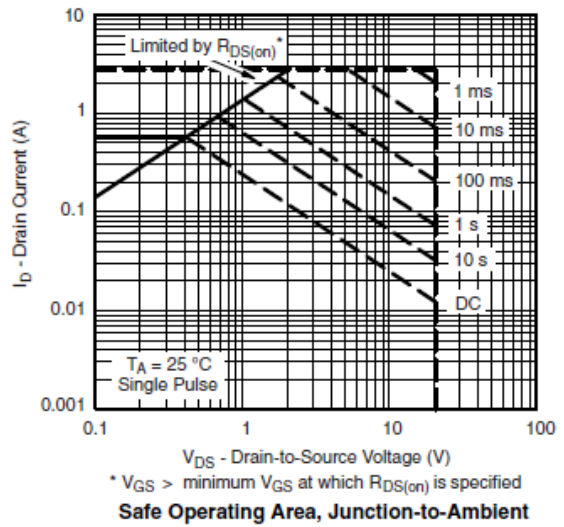
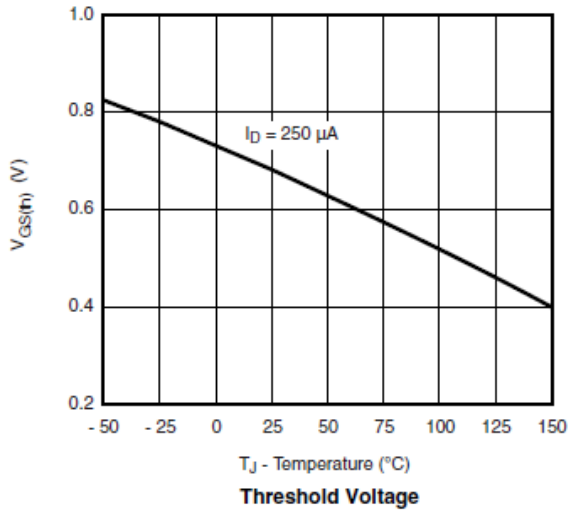
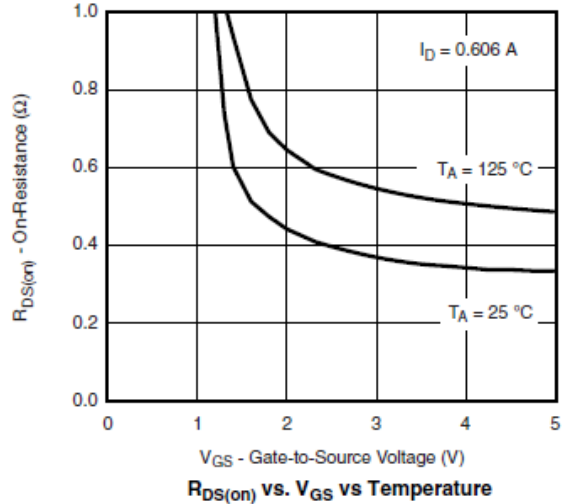
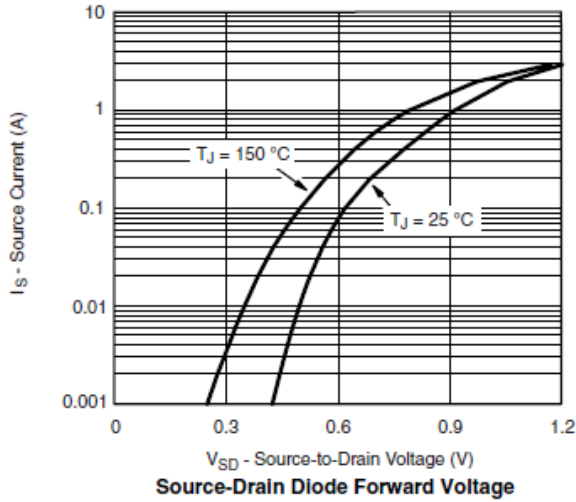


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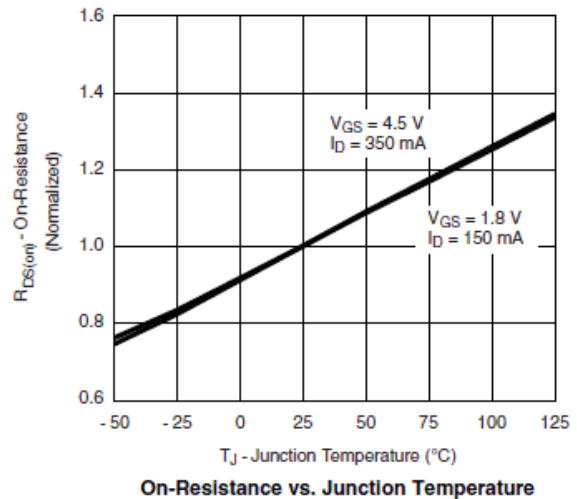
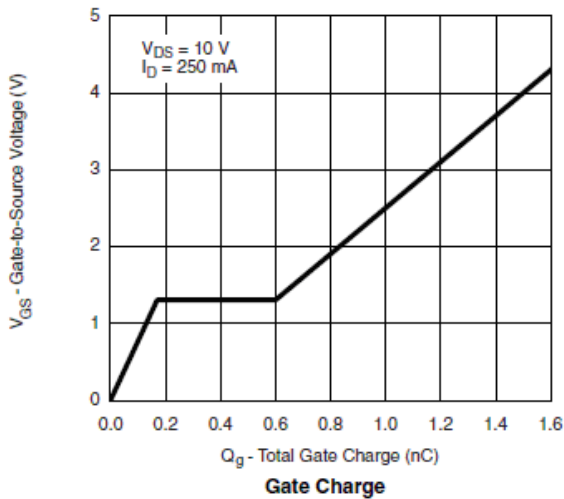
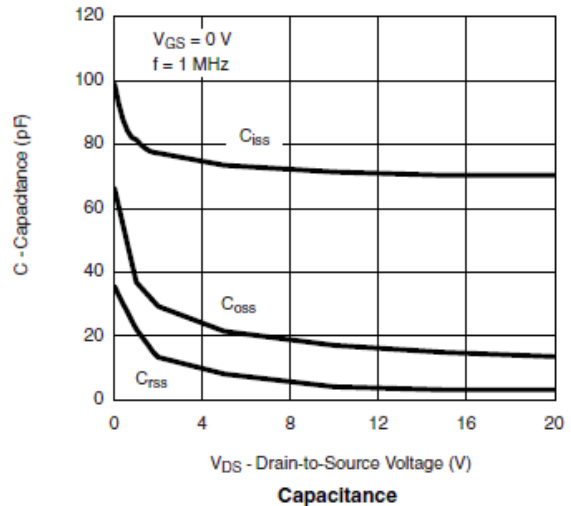
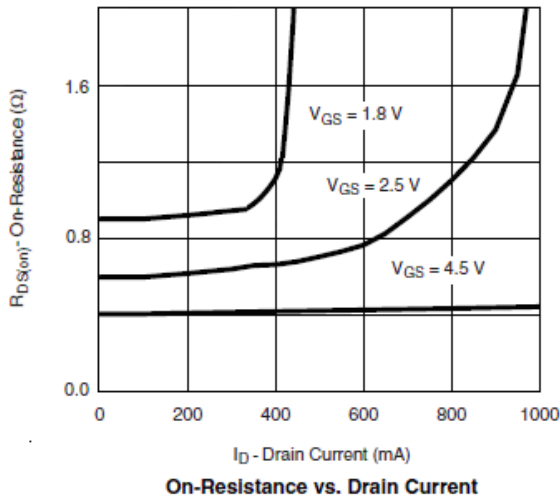
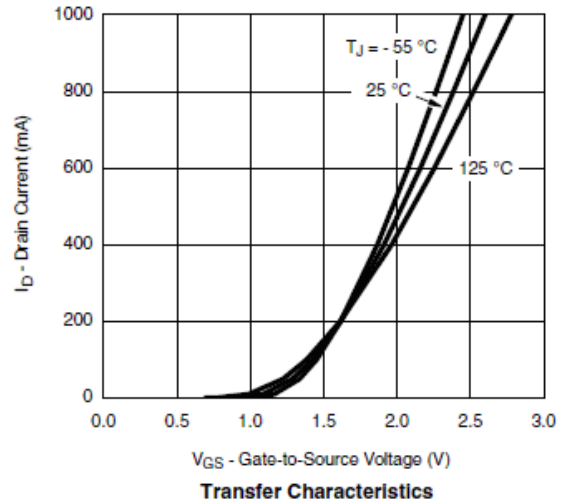
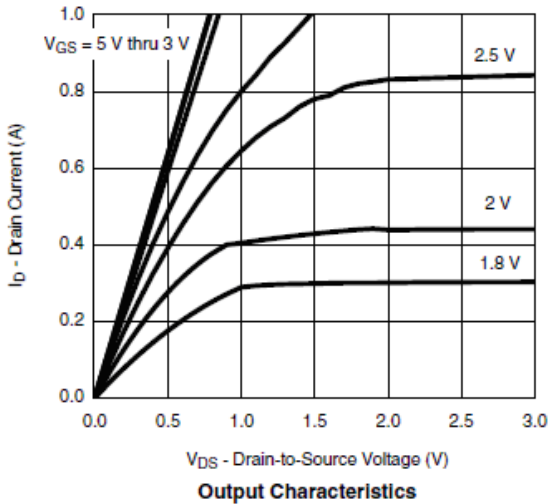


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➤ Typical Characteristics(P-Channel)

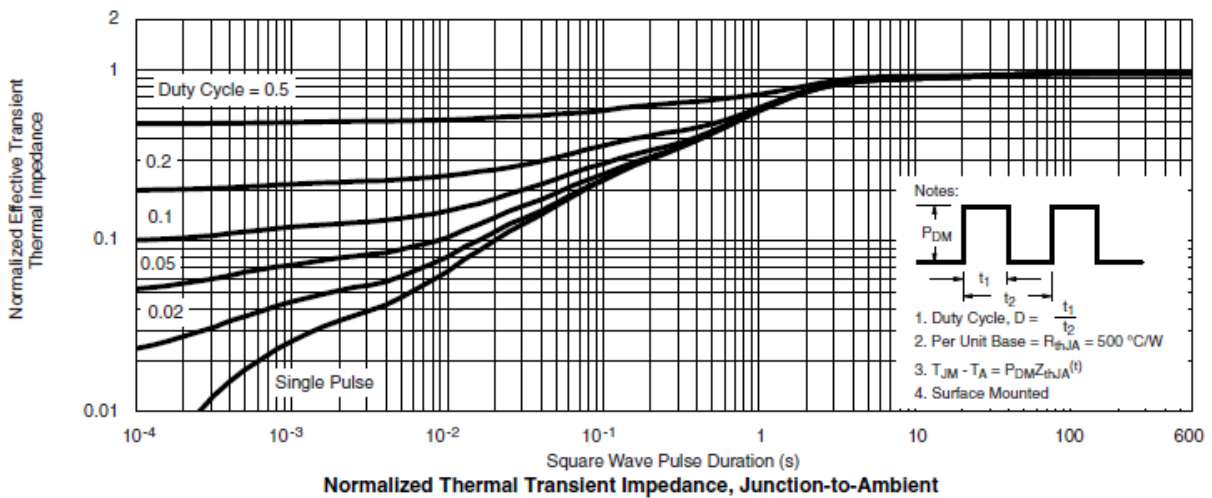
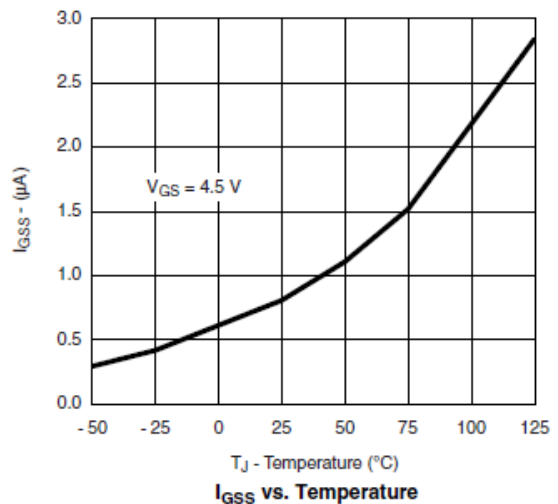
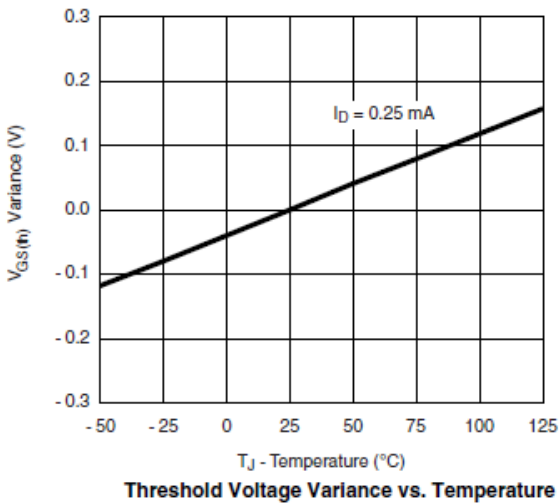
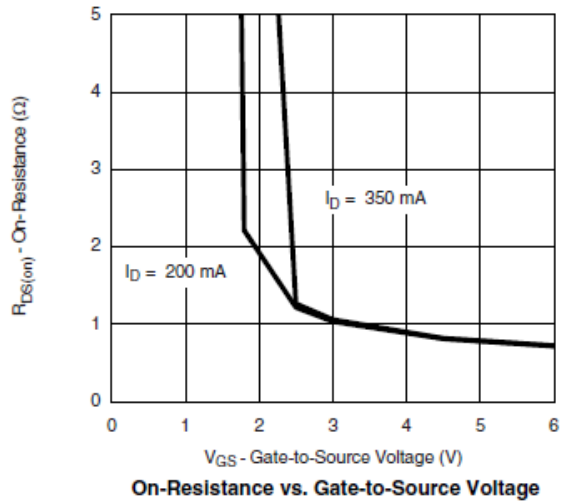
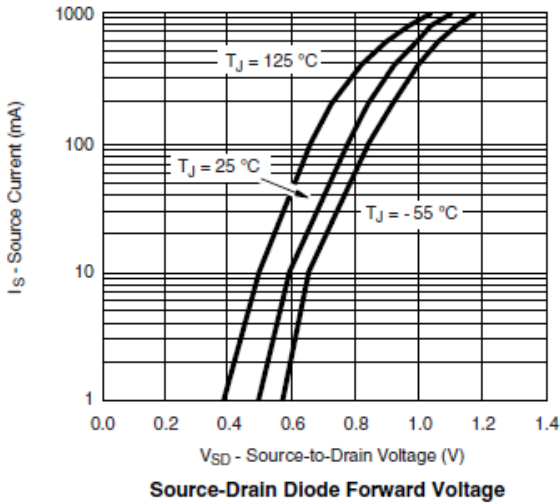


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➤ Typical Characteristics(P-Channel)

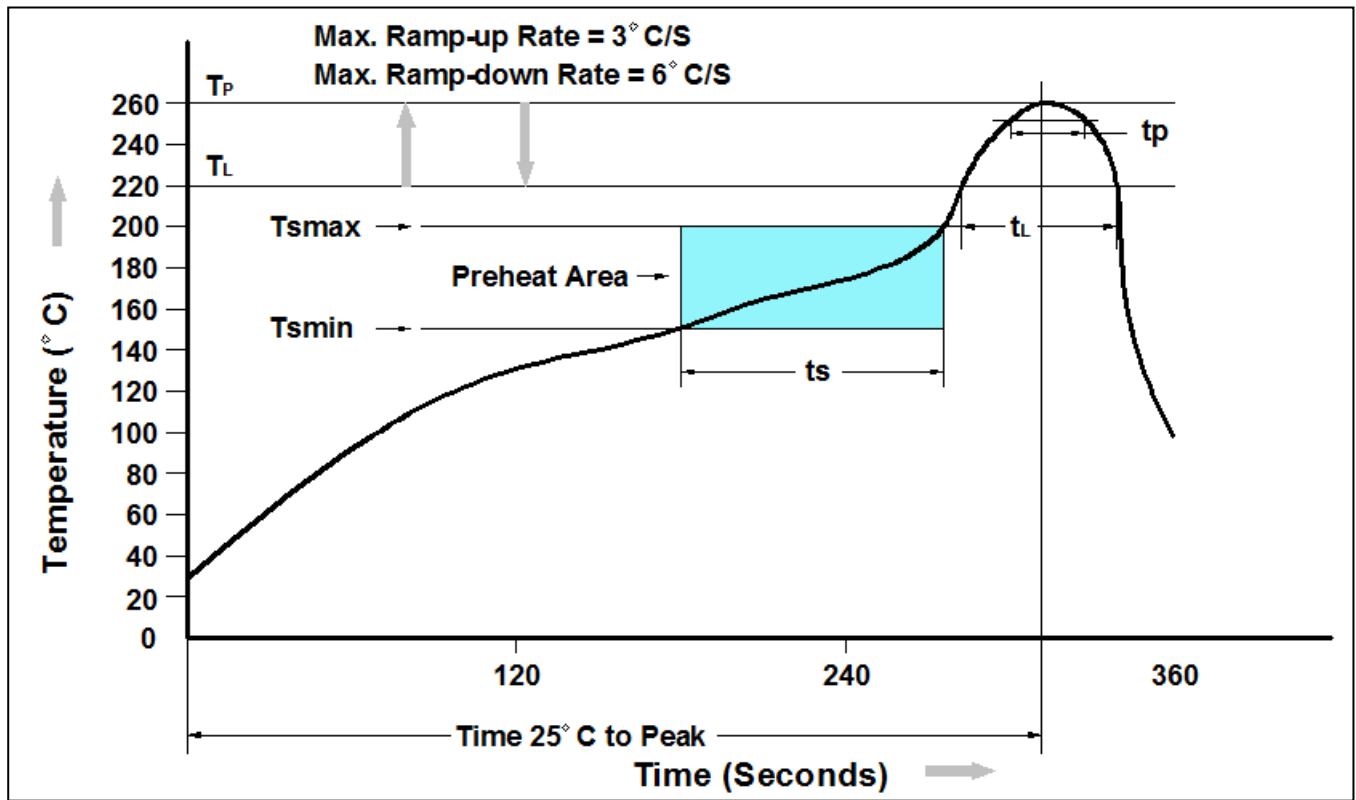


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➤ Recommand IR Reflow Soldering Thermal Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	150°C
Temperature Max. (T _{smax})	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds
Average Ramp-up Rate (t _L to t _P)	3°C/second max.
Liquidous Temperature (T _L)	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (t _P) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

➤ Ordering Information

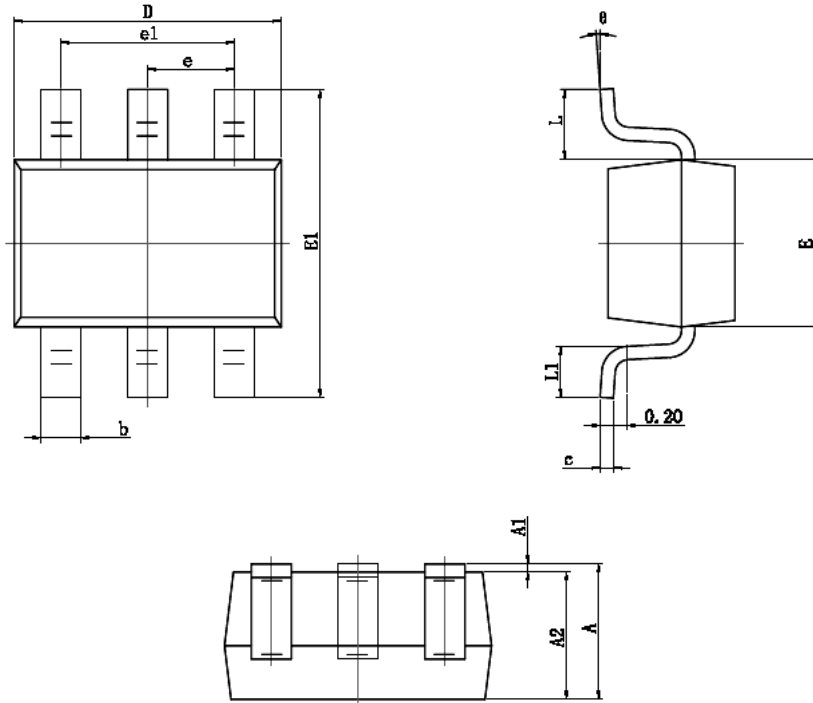
Part Number	Description	Quantity
PAC2332EH	SOT-363 Reel	3000 pcs

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➤ Package Information (SOT-363)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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