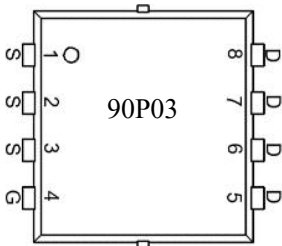
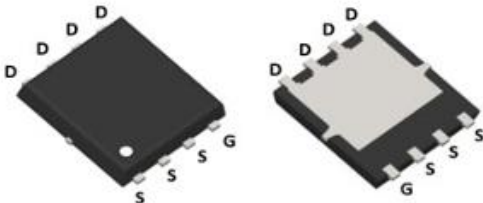
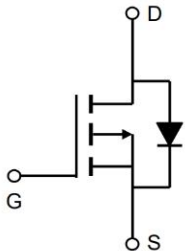


Features ➤ 100% EAS Guaranteed ➤ Green Device Available ➤ Super Low Gate Charge ➤ Excellent CdV/dt effect decline ➤ Advanced high cell density Trench technology	Bvdss	Rdson	ID
	-30V	3.5mΩ	-90A
	Application ➤ Battery protection ➤ Load switch ➤ Uninterruptible power supply		
RoHS			

Package			
			
Marking and pin assignment	PDFN5*6-8L top view		Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
90P03	90P03F	PDFN5*6-8L	5000

Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}\text{C}$	I_D	-90	A
	$T_C = 100^{\circ}\text{C}$	I_D	-57	A
Pulsed Drain Current ¹		I_{DM}	-360	A
Total Power Dissipation ⁴	$T_C = 25^{\circ}\text{C}$	P_D	60	W
Single Pulse Avalanche Energy ²		EAS	125	mJ
Junction Temperature Range		T_J	-55~+150	$^{\circ}\text{C}$
Storage Temperature Range		T_{STG}	-55~+150	$^{\circ}\text{C}$

Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	55	$^{\circ}\text{C}/\text{W}$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	2.08	$^{\circ}\text{C}/\text{W}$



Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL90P03F	PDFN5*6	4	5,6,7,8	1,2,3	Tape Reel

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30	-	-	V
Gate-body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	-1.0	μA
		$V_{DS}=-30V, V_{GS}=0V, T_J=100^{\circ}\text{C}$	-	-	-100	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D = -250\mu A$	-1	-1.6	-2.5	V
Drain-Source On-Resistance ⁴	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -30A$	-	3.5	4.5	m Ω
		$V_{GS} = -4.5V, I_D = -15A$	-	4.8	6.2	
Forward Transconductance ⁴	G_{fs}	$V_{DS}=-10V, I_D = -30A$	-	90	-	S
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V, f=1.0\text{MHz}$	-	5070	-	pF
Output Capacitance	C_{oss}		-	695	-	
Reverse Transfer Capacitance	C_{rss}		-	580	-	
Gate resistance	R_g	$f=1.0\text{MHz}$	-	4	-	Ω
Total Gate Charge	Q_g	$V_{DS}=-15V, I_D=-30A,$ $V_{GS}=-10V$	-	146	-	nC
Gate Source Charge	Q_{gs}		-	21.5	-	
Gate Drain Charge	Q_{gd}		-	39	-	
Turn-ON Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-30A,$ $R_G=3\Omega, V_{GS}=-10V$	-	23	-	ns
Rise Time	t_r		-	15	-	
Turn-OFF Delay Time ⁵	$t_{d(off)}$		-	129	-	
Fall Time ⁵	t_f		-	28	-	
Drain to Source Diode Forward Voltage ⁴	V_{SD}	$V_{GS}=0V, I_S=-30A$	-	-	-1.2	V
Maximum Continuous Drain to Source Diode Forward Current	I_S	$T_C=25^{\circ}\text{C}$	-	-	-90	A

Note :

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^{\circ}\text{C}$
2. The EAS data shows Max. rating . The test condition is $V_{DD} = -25\text{V}$, $V_{GS} = -10\text{V}$, $L = 0.1\text{mH}$, $I_{AS} = -50\text{A}$
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

Typical Performance Characteristics

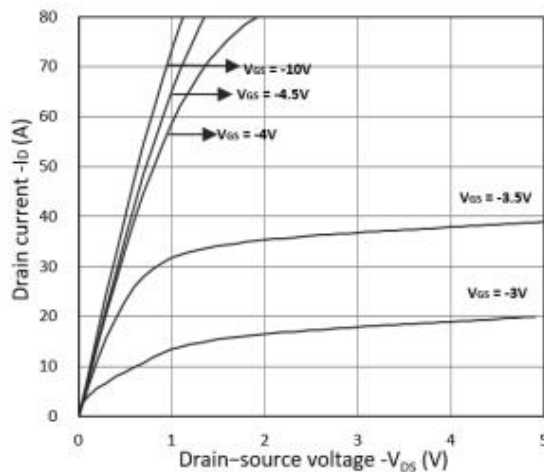


Figure 1. Output Characteristics

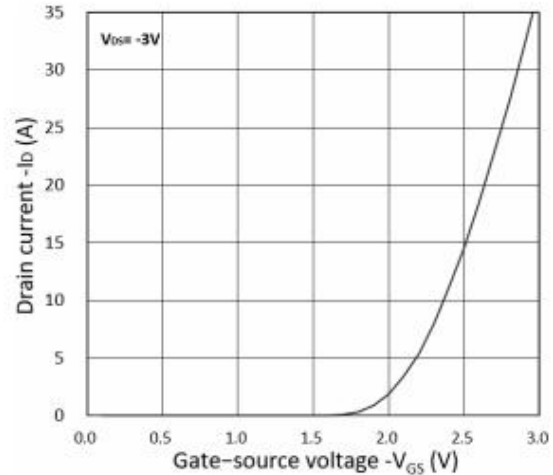


Figure 2. Transfer Characteristics

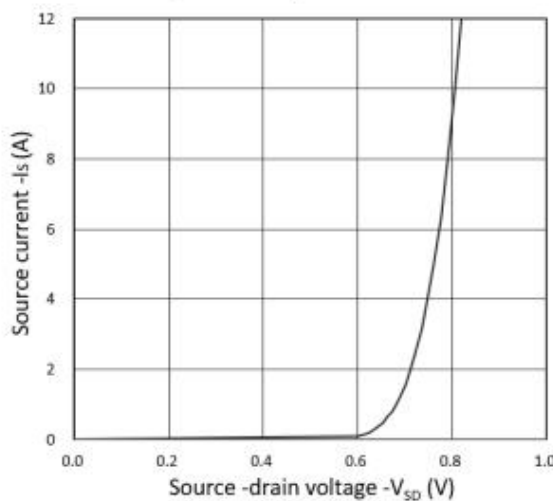


Figure 3. Forward Characteristics of Reverse

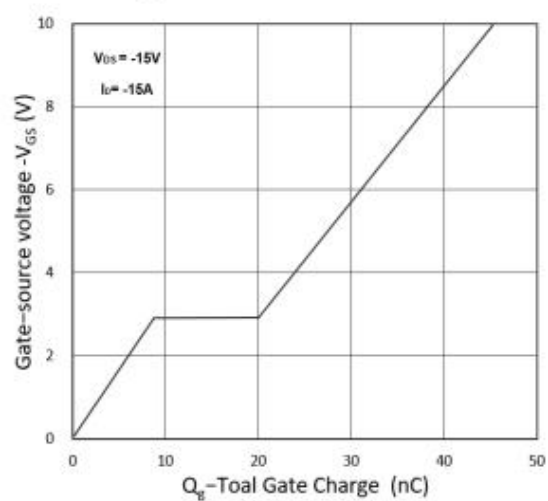


Figure 4. Gate Charge Characteristics

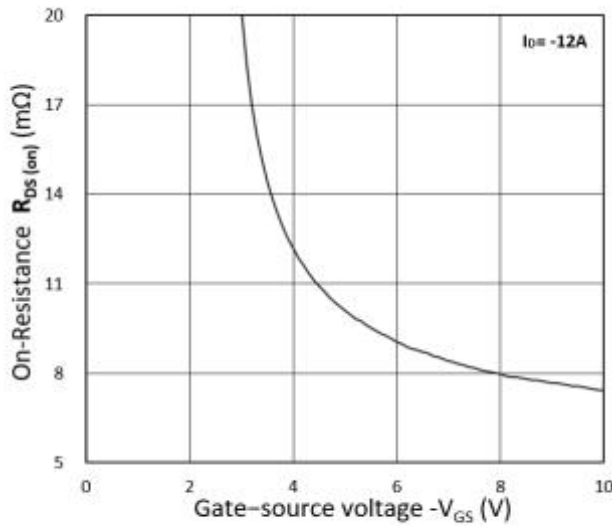


Figure 5. $R_{DS(on)}$ vs. V_{GS}

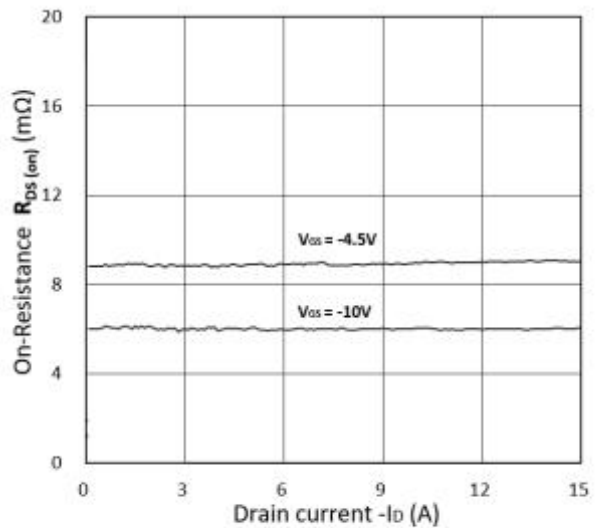


Figure 6. $R_{DS(on)}$ vs. I_D

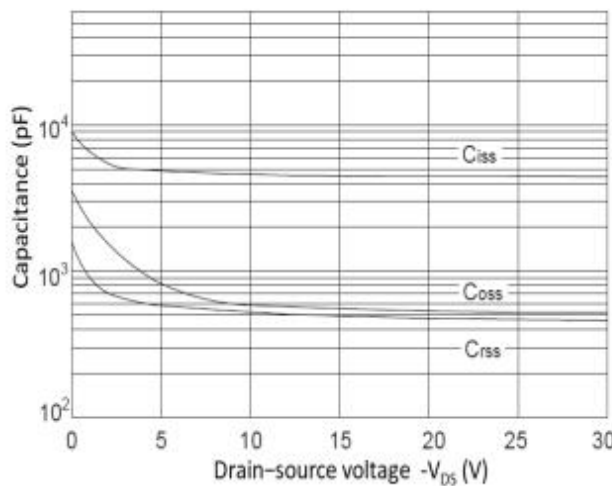


Figure 7. Capacitance Characteristics

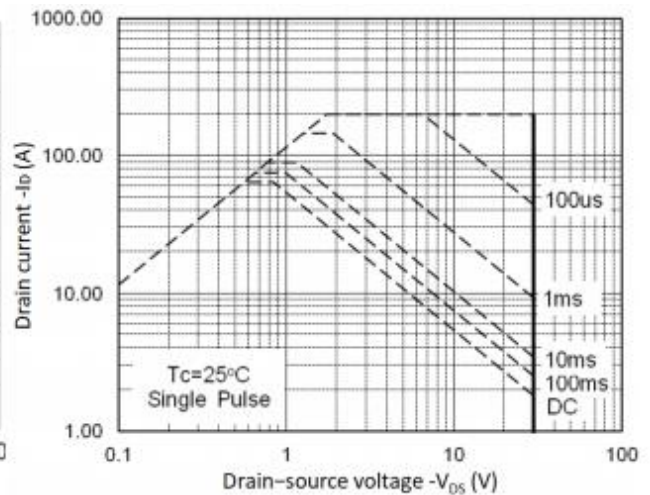
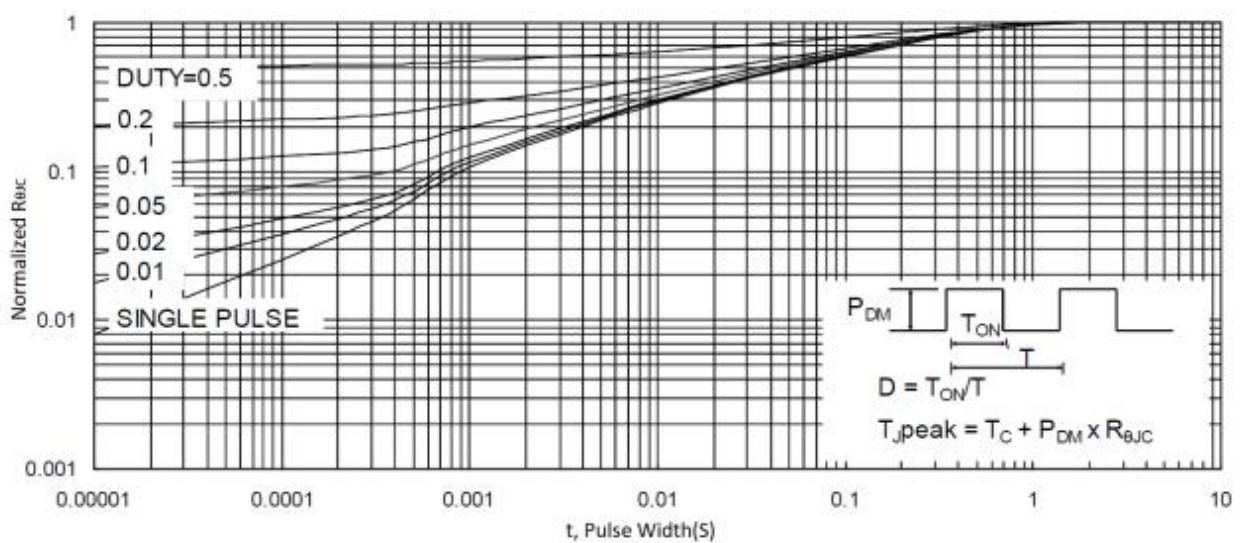


Figure 8. Safe Operating Area



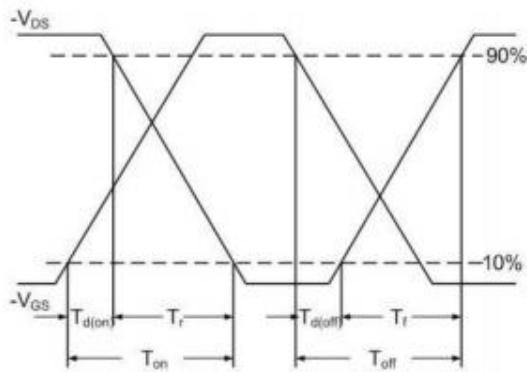


Figure 10. Switching Time Waveform

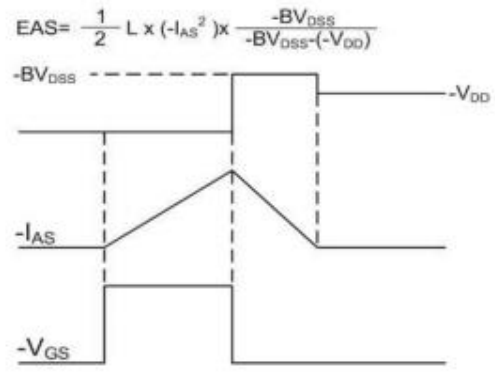
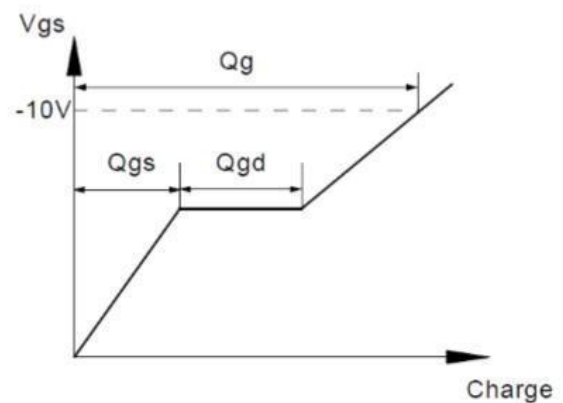
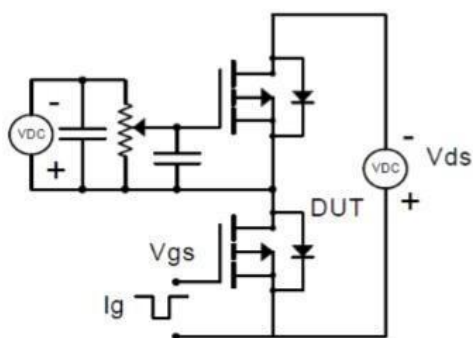


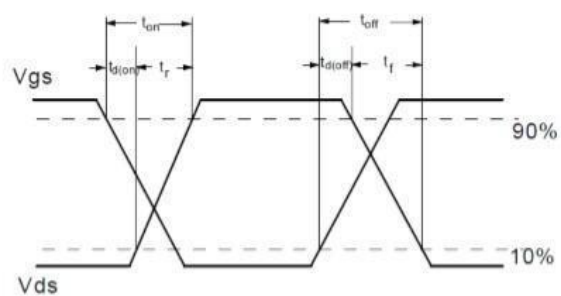
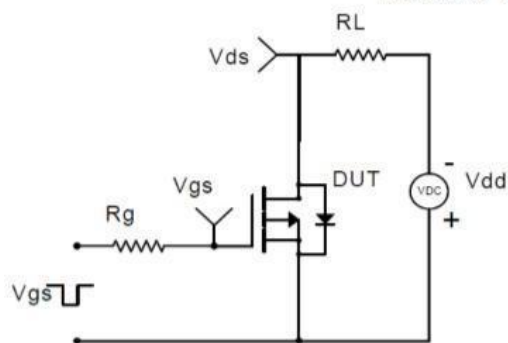
Figure 11. Undamped Inductive Switching Waveform

Test Circuit

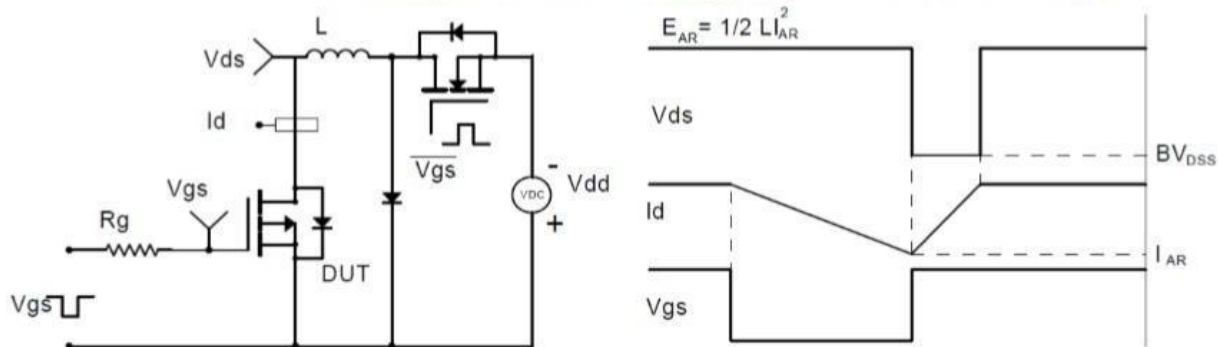
Gate Charge Test Circuit & Waveform



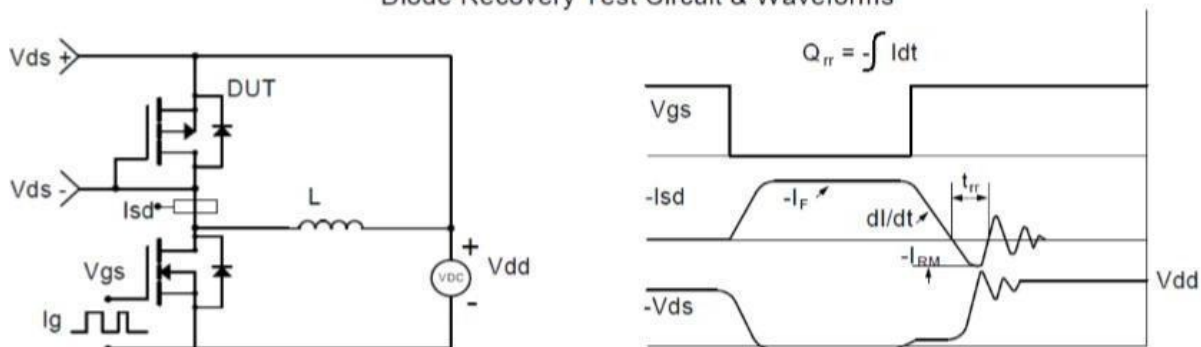
Resistive Switching Test Circuit & Waveforms



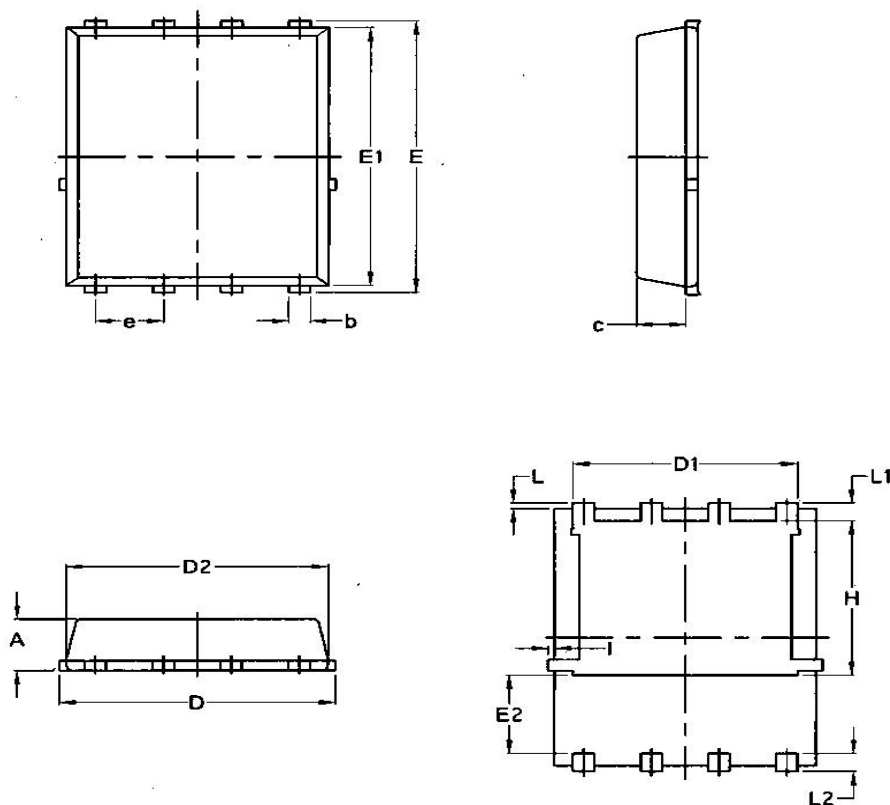
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Dimensions PDFN5x6-8L



Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070



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